JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
SESSION 2022-23
SEMESTER I
TIME TABLE

DOFY 23-24 S-1-MTTR												TIME TABLE(2023-24)
Department of Basic Science and Humanities					GROUPA(ME,CIVIL,EE,IT,ETC) GROUP B (AI/CSE/IT)							W.e.f. 21/11/2023
Branch	Semester	Section	Days	Date	09.20 to 10.20	10.20 to 11.20	11.20 to 12.00	12.00 to 1:00	1.00 to 2.00	2.00 to 3.00	3.00 to 4.00	Name of Dept
EE+ CE	I	A	Thursday	11/21/2023	LACA(SSK)			Chem(DN)		EG(DAY)		
ME + IT	I	B	Thursday	11/21/2023								
IT	I	C	Thursday	11/21/2023								
ETC	I	D	Thursday	11/21/2023								
CSE A	I	E	Thursday	11/21/2023	NMAC(PMP)			Phy(UVR)		BP(JN)		
CSE B	I	F	Thursday	11/21/2023								
AI	I	G	Thursday	11/21/2023								
DS	I	H	Thursday	11/21/2023								
EE+ CE	I	A	Friday	11/22/2023	EIC(SD)			MVE(PMP)		BCME(GMG)		
ME + IT	I	B	Friday	11/22/2023								
IT	I	C	Friday	11/22/2023								
ETC	I	D	Friday	11/22/2023								
CSE A	I	E	Friday	11/22/2023	BEEE(SG)			Sports(SSH)		CI(RMP)		Basic Science and Humanities Department (First Year)
CSE B	I	F	Friday	11/22/2023								
AI	I	G	Friday	11/22/2023								
DS	I	H	Friday	11/22/2023								
EE+ CE	I	A	Satrday	11/23/2023	VSEC(NR)(CE)/(PA)(EE)			SJ(GK)		EEE(NR)		
ME + IT	I	B	Satrday	11/23/2023	VSEC(DAY)(ME)/(SG)(IT)							
IT	I	C	Satrday	11/23/2023	VSEC(SG)							
ETC	I	D	Satrday	11/23/2023	VSEC(AM)							
CSE A	I	E	Satrday	11/23/2023	CMS(SD)			NMAC(PMP)		Phy(UVR)		
CSE B	I	F	Satrday	11/23/2023								
AI	I	G	Satrday	11/23/2023								
DS	I	H	Satrday	11/23/2023								
EE+ CE	I	A	Tuesday	11/26/2023	LACA(SSK)			Chem(DN)		EG(DAY)		
ME + IT	I	B	Tuesday	11/26/2023								
IT	I	C	Tuesday	11/26/2023								
ETC	I	D	Tuesday	11/26/2023								
CSE A	I	E	Tuesday	11/26/2023	CMS(SD)			BEEE(SG)		Phy(UVR)		
CSE B	I	F	Tuesday	11/26/2023								
AI	I	G	Tuesday	11/26/2023								
DS	I	H	Tuesday	11/26/2023								

Mrs. P.M.Parkhi
Time table Incharge,
BSHD

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Dr.U.V.Rathod
Acedemic Incharge,
BSHD

Dr.B.P.Ilamkar
HOD, BSHD

VISION	MISSION
To shape professional Leaders of Global Standards in Civil Engineering.	1. To provide quality Education and Excellent Learning Environment for the overall development of students. 2. Making sustainable efforts for integrating academics with industry.

Date: 02/01/2023

Notice

The Student of 3rd semester are hereby informed that Remedial classes are scheduled to commence from 03-01-23 to 07-01-23. These sessions aim to provide additional support and assistance to enhance your understanding of course materials. Please make sure to attend these classes promptly to make the most out of this opportunity. Your participation is crucial for your academic success.

Remedial Classes Time Table

Year/Sem- II Year/III Sem

Date	Day	Time	Subject
3/1/2023	Tuesday	4.00 pm to 5.00 pm	MORB
4/1/2023	Wednesday	4.00 pm to 5.00 pm	M-III
5/1/2023	Thursday	4.00 pm to 5.00 pm	CSEGI
6/1/2023	Friday	4.00 pm to 5.00 pm	BGGTE
7/1/2023	Saturday	4.00 pm to 5.00 pm	BDD

Time Table Incharge   **Academic Incharge**   **HOD, (Civil)**

(M.M. Khandale)

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

VISION	MISSION
To shape professional Leaders of Global Standards in Civil Engineering.	1. To provide quality Education and Excellent Learning Environment for the overall development of students. 2. Making sustainable efforts for integrating academics with industry.

Date: 03/06/2023

Notice

The Student of 4th semester are hereby informed that Remedial classes are scheduled to commence from 05-06-23 to 10-06-23. These sessions aim to provide additional support and assistance to enhance your understanding of course materials. Please make sure to attend these classes promptly to make the most out of this opportunity. Your participation is crucial for your academic success.

Remedial Classes Time Table

Year/Sem- II Year/IV Sem

Date	Day	Time	Subject
5/6/2023	Monday	4.00 pm to 5.00 pm	Life Science
6/6/2023	Tuesday	4.00 pm to 5.00 pm	Hydrology & Water Resource Engineering.
7/6/2023	Wednesday	4.00 pm to 5.00 pm	Concrete Technology and Design of RCC Building Elements
8/6/2023	Thursday	4.00 pm to 5.00 pm	Solid Mechanics
9/6/2023	Friday	4.00 pm to 5.00 pm	Surveying and Geomatics
10/6/2023	Saturday	4.00 pm to 5.00 pm	Materials, Testing & Evaluation

Time Table Incharge   **Academic Incharge**   **HOD, (Civil)**

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

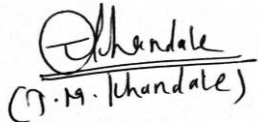| VISION	MISSION
To shape professional Leaders of Global Standards in Civil Engineering.	1. To provide quality Education and Excellent Learning Environment for the overall development of students. 2. Making sustainable efforts for integrating academics with industry.

Date: 19/11/2022

Notice

The Student of 5th semester are hereby informed that Remedial classes are scheduled to commence from 21-11-22 to 25-11-22. These sessions aim to provide additional support and assistance to enhance your understanding of course materials. Please make sure to attend these classes promptly to make the most out of this opportunity. Your participation is crucial for your academic success.

Remedial Classes Time Table

Year/Sem- III Year/V Sem

Date	Day	Time	Subject
21-11-22	Monday	4.00 pm to 5.00 pm	PPLE
22-11-22	Tuesday	4.00 pm to 5.00 pm	FM
23-11-22	Wednesday	4.00 pm to 5.00 pm	SA
24-11-22	Thursday	4.00 pm to 5.00 pm	TRE
25-11-22	Friday	4.00 pm to 5.00 pm	SA

(M.M. Khandale)

Time Table Incharge

Academic Incharge

HOD, (Civil)

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Civil Engineering
"Building Better Development"
Session : 2022-23 (Even Sem)

VISION	MISSION
To shape professional Leaders of Global Standards in Civil Engineering.	1. To provide quality Education and Excellent Learning Environment for the overall development of students. 2. Making sustainable efforts for integrating academics with industry.

Date: 29/04/2023

Notice

The Student of 6th semester are hereby informed that Remedial classes are scheduled to commence from 01-05-23 to 06-05-23. These sessions aim to provide additional support and assistance to enhance your understanding of course materials. Please make sure to attend these classes promptly to make the most out of this opportunity. Your participation is crucial for your academic success.

Remedial Classes Time Table

Year/Sem- III Year/VI Sem

Date	Day	Time	Subject
1/5/2023	Monday	4.00 pm to 5.00 pm	Design of Steel Structures
2/5/2023	Tuesday	4.00 pm to 5.00 pm	Environmental Engineering
3/5/2023	Wednesday	4.00 pm to 5.00 pm	Professional Elective I
4/5/2023	Thursday	4.00 pm to 5.00 pm	Solid Mechanics
5/5/2023	Friday	4.00 pm to 5.00 pm	Surveying and Geomatics
6/5/2023	Saturday	4.00 pm to 5.00 pm	Research Methodology

(M.M. Khandale)

Time Table Incharge   **Academic Incharge**   **HOD, (Civil)**

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 10/11/2022

All the students of B. Tech III Semester (Computer Science & Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 15/11/2022 to 30/11/2022 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	OB
Tuesday	4.00 Pm to 5.00 Pm	DSA
Wednesday	4.00 Pm to 5.00 Pm	M-III
Thursday	4.00 Pm to 5.00 Pm	PPS
Friday	4.00 Pm to 5.00 Pm	OS
Saturday	4.00 Pm to 5.00 Pm	UHR

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Dr. Supriya Sawwashere
Dept. Head CSE

HOD
Computer Science & Engineering
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 10/11/2022

All the students of B. Tech V Semester (Computer Science & Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 19/11/2020 to 30/11/2020 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	DBMS
Tuesday	4.00 Pm to 5.00 Pm	BC
Wednesday	4.00 Pm to 5.00 Pm	DBMS
Thursday	4.00 Pm to 5.00 Pm	BC
Friday	4.00 Pm to 5.00 Pm	DBMS
Saturday	4.00 Pm to 5.00 Pm	BC

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Dr. Supriya Sawwashere
Dept. Head CSE

HOD
Computer Science & Engineering
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in   **E-mail:** info@jdcoem.ac.in

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU

Department of Computer Science & Engineering

"A Place to Learn, A Chance to Grow"

Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

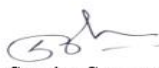# REMEDIAL CLASSES NOTICE

Date: 04/06/2023

All the students of B. Tech IV Semester (Computer Science & Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 06/06/2023 to 20/06/2023 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	CAO
Tuesday	4.00 Pm to 5.00 Pm	JP
Wednesday	4.00 Pm to 5.00 Pm	FLAT
Thursday	4.00 Pm to 5.00 Pm	CN
Friday	4.00 Pm to 5.00 Pm	DMGT
Saturday	4.00 Pm to 5.00 Pm	DBMS

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Dr. Supriya Sawwashere
Dept. Head CSE

HOD
Computer Science & Engineering
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: **www.jdcoem.ac.in**   E-mail: info@jdcoem.ac.in

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU

Department of Computer Science & Engineering

"A Place to Learn, A Chance to Grow"

Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 04/06/2023

All the students of B. Tech VI Semester (Computer Science & Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 06/06/2023 to 20/06/2023 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	AIR
Tuesday	4.00 Pm to 5.00 Pm	NNML
Wednesday	4.00 Pm to 5.00 Pm	CC
Thursday	4.00 Pm to 5.00 Pm	DL
Friday	4.00 Pm to 5.00 Pm	IPR
Saturday	4.00 Pm to 5.00 Pm	AIR

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Dr. Supriya Sawwashere
Dept. Head CSE

HOD
Computer Science & Engineering
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU & MSBTE Mumbai

Department Of Electrical Engineering

"Igniting minds to illuminate the world"

2022-23 (Odd Sem)

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	1. To impart quality education in the field of Electrical Engineering. 2. To be excellent learning centre through research and industry interaction.

Date- 24/09/2022

Remedial Classes Notice

All the students of B.Tech 3rd Sem are hereby informed that the department is going to arrange remedial classes for students who has scored less than 40 marks in aggregate from class test and MSE. Classes schedule is given below.

Sr.No	Day	Time	Subject
1	26/09/2022	4pm to 5 pm	NA
2	27/09/2022	4pm to 5 pm	EMI
3	28/09/2022	4pm to 5 pm	EM-I
4	29/09/2022	4pm to 5 pm	FEE
5	30/09/2022	4pm to 5 pm	Economics

Time Table Incharge   Academic Incharge   HOD

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU & MSBTE Mumbai

Department Of Electrical Engineering

"Igniting minds to illuminate the world"

2022-2023 (Odd Sem)

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	3. To impart quality education in the field of Electrical Engineering. 4. To be excellent learning centre through research and industry interaction.

Date-24/09/2022

Remedial Classes Notice

All the students of B.Tech 5th Sem are hereby informed that the department is going to arrange remedial classes for students who has scored less than 40 marks in aggregate from class test and MSE. Classes schedule is given below.

Sr.No	Day	Time	Subject
1	26/09/2022	4pm to 5 pm	Elective I
2	27/09/2022	4pm to 5 pm	Elective II
3	28/09/2022	4pm to 5 pm	Control System-I
4	29/09/2022	4pm to 5 pm	Power Electronics
5	30/09/2022	4pm to 5 pm	Power System II

Time Table Incharge   Academic Incharge   HOD

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department Of Electrical Engineering
"Igniting minds to illuminate the world"
2022-2023 (Even Sem)

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	5. To impart quality education in the field of Electrical Engineering. 6. To be excellent learning centre through research and industry interaction.

Date- 3/06/2023

Remedial Classes Notice

All the students of B.Tech 4th Sem are hereby informed that the department is going to arrange remedial classes for students who has scored less than 40 marks in aggregate from class test and MSE. Classes schedule is given below.

Sr.No	Day	Time	Subject
1	05/06/2023	4pm to 5 pm	EM-II
2	06/06/2023	4pm to 5 pm	PSP
3	07/06/2023	4pm to 5 pm	PS-I
4	08/06/2023	4pm to 5 pm	EDC
5	09/06/2023	4pm to 5 pm	NMP

Time Table Incharge   Academic Incharge   HOD

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department Of Electrical Engineering
"Igniting minds to illuminate the world"
2022-2023 (Even Sem)

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	7. To impart quality education in the field of Electrical Engineering. 8. To be excellent learning centre through research and industry interaction.

Date- 3/06/2023

Remedial Classes Notice

All the students of B.Tech 6th Sem are hereby informed that the department is going to arrange remedial classes for students who has scored less than 40 marks in aggregate from class test and MSE. Classes schedule is given below.

Sr.No	Day	Time	Subject
1	05/06/2023	4pm to 5 pm	MPMC
2	06/06/2023	4pm to 5 pm	ACS
3	07/06/2023	4pm to 5 pm	Elective –III
4	08/06/2023	4pm to 5 pm	Elective –IV

Time Table Incharge   Academic Incharge   HOD

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Department of Electronics Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23 (Odd Sem)

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

REMEDIAL CLASSES NOTICEw.e.f;15/11/22

All the students of B.Tech 3rd Semester (Electronics & Telecommunication Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 8 Marks in aggregate from the class test and MSE. Classes will commence from 15/11/22 to 30/11/22 as per the following schedule.

S.N	Day	Time	Subject
1	Monday	4.00 Pm to 5.00 Pm	MVC
2	Tuesday	4.00 Pm to 5.00 Pm	EDC-1
3	Wednesday	4.00 Pm to 5.00 Pm	NSAF
4	Thursday	4.00 Pm to 5.00 Pm	ICA
5	Friday	4.00 Pm to 5.00 Pm	ACS
6	Saturday	4.00 Pm to 5.00 Pm	DCM

Prof. Firoz Akhtar

Time-Table Incharge

Prof. A.K.Ikhar

Academic Incharge

Dr. P. R. Kshirsagar

HOD, ETC

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Department of Electronics and Telecommunication Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23 (Odd Sem)

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	3. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 4. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

REMEDIAL CLASSES NOTICE

w.e.f;17/10/22

All the students of B.Tech 5th Semester (Electronics & Telecommunication Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 8 Marks in aggregate from the class test and MSE. Classes will commence from 17/10/22 to 31/10/22 as per the following schedule.

S.N	Day	Time	Subject
1	Monday	4.00 Pm to 5.00 Pm	DSP
2	Tuesday	4.00 Pm to 5.00 Pm	IRCP
3	Wednesday	4.00 Pm to 5.00 Pm	CSE
4	Thursday	4.00 Pm to 5.00 Pm	MCA
5	Friday	4.00 Pm to 5.00 Pm	DSP
6	Saturday	4.00 Pm to 5.00 Pm	IRCP

Prof. Firoz Akhtar

Time-Table Incharge

Prof. A.K.Ikhar

Academic Incharge

Dr. P. R. Kshirsagar

HOD, ETC

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Department of Electronics and Telecommunication Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23 (Odd Sem)

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	5. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 6. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

REMEDIAL CLASSES NOTICE

w.e.f; 01 /09 /22

All the students of B.Tech 7th Semester (Electronics & Telecommunication Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 8 Marks in aggregate from the class test and MSE. Classes will commence from 01/09/22 to 15/09/22 as per the following schedule.

S.N	Day	Time	Subject
1	Monday	4.00 Pm to 5.00 Pm	DC
2	Tuesday	4.00 Pm to 5.00 Pm	PE-III
3	Wednesday	4.00 Pm to 5.00 Pm	PE-IV UHF&MW
4	Thursday	4.00 Pm to 5.00 Pm	PE -V
5	Friday	4.00 Pm to 5.00 Pm	DIP

Prof. Firoz Akhtar   **Prof. A.K.Ikhar**   **Dr. P. R. Kshirsagar**

Time-Table Incharge   **Academic Incharge**   **HOD, ETC**

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

REMEDIAL CLASSES NOTICE   **w.e.f :** 05/06/23

All the students of B.Tech 4th Semester (Electronics & Telecommunication Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the class test and MSE. Classes will commence from 05/06/23 to 10/06/23 as per the following schedule.

S.N	Day	Time	Subject
1	Monday	4.00 Pm to 5.00 Pm	EDC-II
2	Tuesday	4.00 Pm to 5.00 Pm	EMF
3	Wednesday	4.00 Pm to 5.00 Pm	S&S
4	Thursday	4.00 Pm to 5.00 Pm	BPP
5	Friday	4.00 Pm to 5.00 Pm	I&ED
6	Saturday	4.00 Pm to 5.00 Pm	EMI

Prof. Firoz Akhtar   **Prof. A.K.Ikhar**   **Dr. P. R. Kshirsagar**

Time-Table Incharge   **Academic Incharge**   **HOD, ETC**

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Department of Electronics and Telecommunication Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23 (Even Sem)

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	3. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 4. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

REMEDIAL CLASSES NOTICE   w.e.f : 05/06/23

All the students of B.Tech 6th Semester (Electronics & Telecommunication Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the class test and MSE. Classes will commence from 05/06/23 to 09/06/23 as per the following schedule.

S.N	Day	Time	Subject
1	Monday	4.00 Pm to 5.00 Pm	AWP
2	Tuesday	4.00 Pm to 5.00 Pm	AI
3	Wednesday	4.00 Pm to 5.00 Pm	CNCC
4	Thursday	4.00 Pm to 5.00 Pm	AWP
5	Friday	4.00 Pm to 5.00 Pm	CNCC

Prof. Firoz Akhtar

Time-Table Incharge

Prof. A.K.Ikhar

Academic Incharge

Dr. P. R. Kshirsagar

HOD, ETC

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Department of Electronics and Telecommunication Engineering

"Rectifying Ideas, Amplifying Knowledge"

2022-23 (Even Sem)

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	5. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 6. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

REMEDIAL CLASSES NOTICE   w.e.f:05/06/23

All the students of B.Tech 8th Semester (Electronics & Telecommunication Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the class test and MSE. Classes will commence from 05/06/23 to 06/06/23 as per the following schedule.

S.N	Day	Time	Subject
1	Monday	4.00 Pm to 5.00 Pm	5G Wireless network
2	Tuesday	4.00 Pm to 5.00 Pm	Professional elective

Prof. Firoz Akhtar

Time-Table Incharge

Prof. A.K.Ikhar

Academic Incharge

Dr. P. R. Kshirsagar

HOD, ETC

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Information Technology
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 14/01/2022

All the students of B. Tech III Semester (IT) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE. Classes will commence from 17/01/2022 to 22/01/2022 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	OB
Tuesday	4.00 Pm to 5.00 Pm	DEFM
Wednesday	4.00 Pm to 5.00 Pm	M-III
Thursday	4.00 Pm to 5.00 Pm	CAO
Friday	4.00 Pm to 5.00 Pm	CG
Saturday	4.00 Pm to 5.00 Pm	UHR

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

HOD IT
H.O.D.
Department of CSE-IT
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: **www.jdcoem.ac.in**   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Information Technology
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 16/11/2020

All the students of B. Tech V Semester (IT) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE. Classes will commence from 19/11/2020 to 30/11/2020 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	ESIOT
Tuesday	4.00 Pm to 5.00 Pm	DAA
Wednesday	4.00 Pm to 5.00 Pm	CCS
Thursday	4.00 Pm to 5.00 Pm	ESIOT
Friday	4.00 Pm to 5.00 Pm	IPR
Saturday	4.00 Pm to 5.00 Pm	DAA

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

HOD IT

H.O.D.
Department of CSE-IT
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU

Department of Information Technology

"A Place to Learn, A Chance to Grow"

Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 04/06/2023
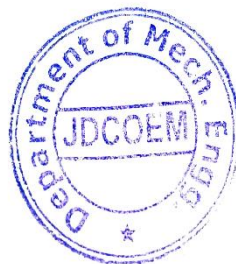
All the students of B. Tech IV Semester (IT) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE. Classes will commence from 06/06/2023 to 20/06/2023 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	CAO
Tuesday	4.00 Pm to 5.00 Pm	CA
Wednesday	4.00 Pm to 5.00 Pm	TOC
Thursday	4.00 Pm to 5.00 Pm	CN
Friday	4.00 Pm to 5.00 Pm	DMGT
Saturday	4.00 Pm to 5.00 Pm	DBMS

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

HOD IT

H.O.D.
Department of CSE-IT
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU

Department of Information Technology

"A Place to Learn, A Chance to Grow"

Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 04/06/2023

All the students of B. Tech VI Semester (IT) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE. Classes will commence from 06/06/2023 to 20/06/2023 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	AWN
Tuesday	4.00 Pm to 5.00 Pm	ML
Wednesday	4.00 Pm to 5.00 Pm	Elective-1
Thursday	4.00 Pm to 5.00 Pm	Elective-2
Friday	4.00 Pm to 5.00 Pm	AWN
Saturday	4.00 Pm to 5.00 Pm	ML

Prof. A. P. Nanotkar

Timetable In-charge

Prof. Swati Raut

Dept. Academic Incharge

HOD IT

H.O.D.

Department of CSE-IT

JDCOEM, Nagpur

Principal

J D College of Engineering & Management

Khandala, Katol Road

Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Affiliated to DBATU, RTMNU & MSBTE Mumbai

2022-23(ODD SEM)

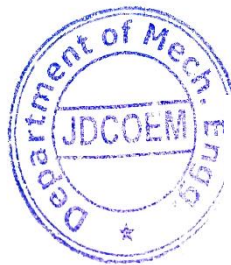| VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering."	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skills and hard skills to achieve the institutional vision.

w.e.f:26/09/2022

REMEDIAL CLASSES NOTICE

All The students of B. TECH 3rd semester (Mechanical Engineering) are hereby informed that the Department is going to arrange remedial classes for students who have scored less than 40 marks in aggregate from the class test and MSE. Classes will commence form 26/09/2022 to 30/09/2022 as per the following schedule.

Sr. No	Day	Time	Subject
1	Monday	04:00 pm to 05:00 pm	M-III
2	Tuesday	04:00 pm to 05:00 pm	TOM-I
3	Wednesday	04:00 pm to 05:00 pm	ET
4	Friday	04:00 pm to 05:00 pm	M-III
5	Saturday	04:00 pm to 05:00 pm	TOM-I
6	Monday	04:00 pm to 05:00 pm	ET

Time Table In-charge
DOME, JDCOEM

Academic In-Charge
DOME, JDCOEM

HOD
DOME, JDCOEM
Head of Department
Mechanical Engineering
J D College of Engineering & Management
Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Affiliated to DBATU, RTMNU & MSBTE Mumbai

2022-23(ODD SEM)

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering."	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skills and hard skills to achieve the institutional vision.

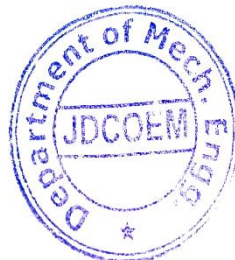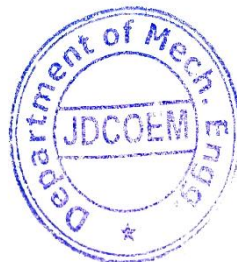**w.e.f:26/09/2022**

REMEDIAL CLASSES NOTICE

All The students of B. TECH 5th semester (Mechanical Engineering) are hereby informed that the Department is going to arrange remedial classes for students who have scored less than 40 marks in aggregate from the class test and MSE. Classes will commence form 26/09/2022 to 30/09/2022 as per the following schedule.

Sr. No	Day	Time	Subject
1	Monday	04:00 pm to 05:00 pm	HT
2	Tuesday	04:00 pm to 05:00 pm	TOM II
3	Wednesday	04:00 pm to 05:00 pm	HT
4	Friday	04:00 pm to 05:00 pm	TOM II
5	Saturday	04:00 pm to 05:00 pm	HT
6	Monday	04:00 pm to 05:00 pm	TOM II

Time Table In-charge
 DOME, JDCOEM

Academic In-Charge
 DOME, JDCOEM

HOD
DOME, JDCOEM

Head of Department
Mechanical Engineering
J D College of Engineering & Management
Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
2022-23(EVEN SEM)

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering."	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skills and hard skills to achieve the institutional vision.

w.e.f:05/06/2023

REMEDIAL CLASSES NOTICE

All The students of B. TECH 4th semester (Mechanical Engineering) are hereby informed that the Department is going to arrange remedial classes for students who have scored less than 40 marks in aggregate from the class test and MSE. Classes will commence form 05/06/2023 to 10/06/2023 as per the following schedule.

Sr. No	Day	Time	Subject
1	Monday	04:00 pm to 05:00 pm	SOM
2	Tuesday	04:00 pm to 05:00 pm	FM
3	Wednesday	04:00 pm to 05:00 pm	ME-II
4	Friday	04:00 pm to 05:00 pm	SOM
5	Saturday	04:00 pm to 05:00 pm	FM
6	Monday	04:00 pm to 05:00 pm	ME-II

Time Table In-charge
DOME, JDCOEM

Academic In-Charge
DOME, JDCOEM

HOD
DOME, JDCOEM

Head of Department
Mechanical Engineering
J D College of Engineering & Management
Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
2022-23(EVEN SEM)

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering."	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skills and hard skills to achieve the institutional vision.

w.e.f:05/06/2023

REMEDIAL CLASSES NOTICE

All The students of B. TECH 6th semester (Mechanical Engineering) are hereby informed that the Department is going to arrange remedial classes for students who have scored less than 40 marks in aggregate from the class test and MSE. Classes will commence form 05/06/2023 to 10/06/2023 as per the following schedule.

Sr. No	Day	Time	Subject
1	Monday	04:00 pm to 05:00 pm	DOM
2	Tuesday	04:00 pm to 05:00 pm	OR
3	Wednesday	04:00 pm to 05:00 pm	AT
4	Friday	04:00 pm to 05:00 pm	DOM
5	Saturday	04:00 pm to 05:00 pm	OR
6	Monday	04:00 pm to 05:00 pm	AT

Time Table In-charge
DOME, JDCOEM

Academic In-Charge
DOME, JDCOEM

HOD
DOME, JDCOEM

Head of Department
Mechanical Engineering
J D College of Engineering & Management
Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Artificial Intelligence
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 14/01/2022

All the students of B. Tech III Semester (Artificial Intelligence) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 17/01/2022 to 22/01/2022 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	OB
Tuesday	4.00 Pm to 5.00 Pm	DSA
Wednesday	4.00 Pm to 5.00 Pm	M-III
Thursday	4.00 Pm to 5.00 Pm	DEFM
Friday	4.00 Pm to 5.00 Pm	OSV
Saturday	4.00 Pm to 5.00 Pm	UHR

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Prof. Supriya Sawwashere
HOD AI
HOD
Artificial Intelligence
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU

Department of Artificial Intelligence

"A Place to Learn, A Chance to Grow"

Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 14/01/2022

All the students of B. Tech V Semester (Computer Science & Engineering) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 17/01/2022 to 22/01/2022 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	AICR
Tuesday	4.00 Pm to 5.00 Pm	DITA
Wednesday	4.00 Pm to 5.00 Pm	MLDL
Thursday	4.00 Pm to 5.00 Pm	AIBI
Friday	4.00 Pm to 5.00 Pm	IED
Saturday	4.00 Pm to 5.00 Pm	AICR

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Prof. Supriya Sawwashere
HOD AI
HOD
Artificial Intelligence
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Artificial Intelligence
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 04/06/2023

All the students of B. Tech IV Semester (Artificial Intelligence) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 06/06/2023 to 20/06/2023 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	IOT
Tuesday	4.00 Pm to 5.00 Pm	DAA
Wednesday	4.00 Pm to 5.00 Pm	OSV
Thursday	4.00 Pm to 5.00 Pm	NNFS
Friday	4.00 Pm to 5.00 Pm	DMGT
Saturday	4.00 Pm to 5.00 Pm	DBMS

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Prof. Supriya Sawwashere
HOD AI
HOD
Artificial Intelligence
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Artificial Intelligence
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

REMEDIAL CLASSES NOTICE

Date: 04/06/2023

All the students of B. Tech VI Semester (Artificial Intelligence) are hereby informed that the department is going to arrange remedial classes for students who have scored less than 40 Marks in aggregate from the Class test and MSE.

Classes will commence from 06/06/2023 to 20/06/2023 as per the following schedule.

Day/Time	Time	Subject Name
Monday	4.00 Pm to 5.00 Pm	ACV
Tuesday	4.00 Pm to 5.00 Pm	DS
Wednesday	4.00 Pm to 5.00 Pm	ELECTIVE-I
Thursday	4.00 Pm to 5.00 Pm	ELECTIVE-I
Friday	4.00 Pm to 5.00 Pm	IPR
Saturday	4.00 Pm to 5.00 Pm	ACV

Prof. A. P. Nanotkar
Timetable In-charge

Prof. Swati Raut
Dept. Academic Incharge

Prof. Supriya Sawwashere
HOD AI
HOD
Artificial Intelligence
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Education to Eternity

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

NOTICE
REMEDIAL CLASSES
ACADEMIC YEAR 2022-23

The students of **Semester-I** of the Department of Management are hereby informed to attend the remedial classes as per the below Time Table. The list of students who have to attend the remedial classes is attached herewith. Kindly refer the same.

Sr. No.	Date	Day	Name of Course	Timing
1	09/03/2023	Thursday	Financial Reporting, Statements and Analysis	09:30 am- 10:30 am
2	09/03/2023	Thursday	Financial Reporting, Statements and Analysis	10:30 am- 11:30 am
3	09/03/2023	Thursday	Organizational Behaviour	11:30 am- 12:20 pm
4	09/03/2023	Thursday	Managerial Economics	01:00 pm- 02:00 pm
5	10/03/2023	Friday	Business Statistics and Analytics for Decision Making	09:30 am- 10:30 am
6	10/03/2023	Friday	Business Statistics and Analytics for Decision Making	10:30 am- 11:30 am
7	10/03/2023	Friday	Business Research	11:30 am- 12:20 pm
8	10/03/2023	Friday	Legal and Business Environment	01:00 pm- 02:00 pm

Time Table In-charge

Academic Coordinator

HOD- MBA

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

CIRCULAR
REMEDIAL CLASSES
ACADEMIC YEAR 2022-23

All the faculty members of the Department of Management Studies are hereby requested to engage the remedial classes as per the below Time Table. The Attendance record of the remedial classes must be maintained by respective course in charge.

Sr. No.	Date	Day	Name of Course	Timing
1	09/03/2023	Thursday	Financial Reporting, Statements and Analysis	09:30 am- 10:30 am
2	09/03/2023	Thursday	Financial Reporting, Statements and Analysis	10:30 am- 11:30 am
3	09/03/2023	Thursday	Organizational Behaviour	11:30 am- 12:20 pm
4	09/03/2023	Thursday	Managerial Economics	01:00 pm- 02:00 pm
5	10/03/2023	Friday	Business Statistics and Analytics for Decision Making	09:30 am- 10:30 am
6	10/03/2023	Friday	Business Statistics and Analytics for Decision Making	10:30 am- 11:30 am
7	10/03/2023	Friday	Business Research	11:30 am- 12:20 pm
8	10/03/2023	Friday	Legal and Business Environment	01:00 pm- 02:00 pm

Time Table In-charge

Academic Coordinator

HOD- MBA

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

NOTICE
REMEDIAL CLASSES
ACADEMIC YEAR 2022-23

The students of **Semester-II** of the Department of Management are hereby informed to attend the remedial classes as per the below Time Table. The list of students who have to attend the remedial classes is attached herewith. Kindly refer the same.

Sr. No.	Date	Day	Name of Course	Timing
1	06/07/2023	Thursday	Financial Management	09:30 am- 10:30 am
2	06/07/2023	Thursday	Financial Management	10:30 am- 11:30 am
3	06/07/2023	Thursday	Human Resource Management	11:30 am- 12:20 pm
4	06/07/2023	Thursday	Operations Management	01:00 pm- 02:00 pm
5	07/07/2023	Friday	Strategic Management	09:30 am- 10:30 am
6	07/07/2023	Friday	Marketing Management	10:30 am- 11:30 am
7	07/07/2023	Friday	Cost Accounting	11:30 am- 12:20 pm
8	07/07/2023	Friday	Cost Accounting	01:00 pm- 02:00 pm

Time Table In-charge   Academic Coordinator   HOD- MBA

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

CIRCULAR
REMEDIAL CLASSES
ACADEMIC YEAR 2022-23

All the faculty members of the Department of Management Studies are hereby requested to engage the remedial classes as per the below Time Table. The Attendance record of the remedial classes must be maintained by respective course in charge.

Sr. No.	Date	Day	Name of Course	Timing
1	06/07/2023	Thursday	Financial Management	09:30 am- 10:30 am
2	06/07/2023	Thursday	Financial Management	10:30 am- 11:30 am
3	06/07/2023	Thursday	Human Resource Management	11:30 am- 12:20 pm
4	06/07/2023	Thursday	Operations Management	01:00 pm- 02:00 pm
5	07/07/2023	Friday	Strategic Management	09:30 am- 10:30 am
6	07/07/2023	Friday	Marketing Management	10:30 am- 11:30 am
7	07/07/2023	Friday	Cost Accounting	11:30 am- 12:20 pm
8	07/07/2023	Friday	Cost Accounting	01:00 pm- 02:00 pm

Time Table In-charge   Academic Coordinator   HOD- MBA

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
An Autonomous Institute, with NAAC "A" Grade
Department of Training and Placement
2022-23

Education to Eternity

VISION	MISSION
"To be the Department providing strong human quotient thereby making our students top class professionals and entrepreneurs."	4. To provide the world class training for the students through continuous training modules. 5. To improve industry institute relationship. 6. To enhance students interest towards entrepreneurship and business strategies.

Super 40 Students (2022-23)

Training and Placement department in association with all departments of our college will form super-40 students groups.

The criteria for selection of Super-40 groups students are as follow:

Sr. No	Selection Process
1	60% Aggregate throughout SSC onward.
2	Aptitude Test
3	Group Discussion
4	Technical Interview
5	Personal Interview
6	Overall Performance in the department as suggested by HOD and senior faculty

On the basis of above criteria, we will form Super-40 group at college level

List of Super 40 Students   Batch:- 2022-23

Sr No.	Full Name	Branch	Email Id	Mobile Number
1	Sarthak Pal	IT	sarthakpal3210@gmail.com	9325461580
2	Shejal Dandekar	IT	shejaldandekar2002@gmail.com	9.19172E+11
3	RASHI WASNIK	CSE	RASHIWASNIK1309@GMAIL.COM	9307549710
4	Anshum Nandgave	CSE	kittunandgawe@gmail.com	7218824507
5	Lokesh Shahare	ME	lokeshshahare2001@gmail.com	9322019521
6	Khushbu patel	ETC	Kp8779628@gmail.com	9970613440
7	Ekta Paraswani	IT	ekunp99@gmail.com	9422086885
8	Rakesh khedikar	ME	rakeshkhedik@gmail.com	8975465527
9	KRUSHNA MALTHANKAR	IT	krishnamalthankar@gmail.com	9112353217
10	Sahil Chole	EE	cholesahil@gmail.com	9975431746
11	Jyoti Yadav	ME	jyotiryadav358@gmail.com	9579538036
12	Harsh Dhoke	CSE	harshdhoke0@gmail.com	8830078391
13	Vidhya Nimje	IT	vidhyanimje2000@gmail.com	9373211333
14	Anshul Patne	IT	anshulpatne@gmail.com	9145759789

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
An Autonomous Institute, with NAAC "A" Grade
Department of Training and Placement
2022-23

	VISION		MISSION	
	"To be the Department providing strong human quotient thereby making our students top class professionals and entrepreneurs."		4. To provide the world class training for the students through continuous training modules. 5. To improve industry institute relationship. 6. To enhance students interest towards entrepreneurship and business strategies.	

15	PRATIK DHOKE	CSE	pratikdhoke1234@gmail.com	7263070026
16	Akash Sahastrabuddhe	ETC	akashsahastrabuddhe1@gmail.com	9022808398
17	Vaidehi Meshram	ETC	vaidehimeshram53@gmail.com	7420920017
18	Tejaswini Wakalkar	EE	tejaswiniwakalkar@gmail.com	8459515778
19	Rohit Salunke	CSE	aryansalunke567@gmail.com	7387549257
20	Homesh Pakhale	ME	hupakhale@jdcoem.ac.in	7385746630
21	Gaurav Zade	ETC	gauravzade121@gmail.com	9307740961
22	Prajwal Mohokar	ETC	Mohokarprajwal@gmail.com	8208560384
23	Huzefa Babinwale	IT	Babinwalehuzefa@gmail.com	9834146770
24	Ankur Dongre	EE	ankurdongre210@gmail.com	9309766041

25	Piyush nandanwar	ME	piyushnandanwar199@gmail.com	7558517009
26	Samir Rahangdale	Civil	rahangdalesamir789@gmail.com	9.19359E+11
27	Prafull Vaishnav	Civil	psdvaishnav45913@gmail.com	8055266630
28	Prathmesh Dhanaskar	ME	prathmeshdhanaskar@gmail.com	9665868923
29	Nikita Ganvir	ETC	nikganvir03@gmail.com	8847786730
30	Nihal Bonde	ME	nihalbonde1999@gmail.com	9021348205
31	Sahil Dhenge	EE	sahildhenge111@gmail.com	8055716294
32	Anjali Anil Ghutke	CSE	Anjalighutke01@gmail.com	9307771643
33	Gurucharan Gautam	Civil	gurugautam9657@gmail.com	9823182548
34	Vinita Larokar	IT	vinitalarokar21@gmail.com	9172781320
35	Dolly Rahangdale	IT	dollyrahangdale70@gmail.com	9359898303
36	Shejal Dandekar	IT	shejaldandekar2002@gmail.com	9.19172E+11
37	Latish Chambhare	CSE	latishchambhare20@gmail.com	9689498186
38	Ashwin Ghugal	ME	adghugal@jdcoem.ac.in	8007085545
39	Akansha Potbhare	ETC	akankshapotbhare67@gmail.com	9689320827
40	Omkar porlikar	IT	porlikarom676@gmail.com	76662 67904
41	Yash Nikam	IT	yashdnikam14@gmail.com	7263047930

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Training and Placement Department
J D College of Engineering & Management
Training & Placement Officer

JAIDEV EDUCATION SOCIETY'S
JD COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Civil Engineering
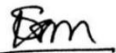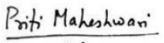**"Building Better Development"**
Session 2022-23

VISION	MISSION
To be a well-known center for shaping professional leaders of Global Standards in Civil Engineering	• Provide quality education and excellent learning Environment for overall development of students. • Making Sustainable efforts for integrating academics with Industry.

CE Student NPTEL Certificate- 2022-23

Elite

NPTEL Online Certification
(Funded by the MoE, Govt. of India)

This certificate is awarded to

KAMLESH DAYANANAD PATLE

for successfully completing the course

Rural Water Resources Management

with a consolidated score of **61** %

Online Assignments	23.75/25	Proctored Exam	37.5/75

Total number of candidates certified in this course: **480**

Jan-Apr 2023
(12 week course)

Prof. Sridhar Iyer
Head CDEEP & NPTEL Coordinator
IIT Bombay

Indian Institute of Technology Bombay

swayam
FREE ONLINE EDUCATION

Roll No: NPTEL23GE12S44273874   To validate the certificate   No. of credits recommended: 3 or 4

CE- 2022-23

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

HOD, (CE)

JAIDEV EDUCATION SOCIETY'S
JD COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Civil Engineering
"Building Better Development"
Session 2022-23

VISION	MISSION
To be a well-known center for shaping professional leaders of Global Standards in Civil Engineering	• Provide quality education and excellent learning Environment for overall development of students. • Making Sustainable efforts for integrating academics with Industry.

CE Student NPTEL Certificate- 2022-23

Elite

NPTEL Online Certification
(Funded by the MoE, Govt. of India)

This certificate is awarded to

SONU SHANKAR KUMBHALE

for successfully completing the course

Air Pollution and Control

with a consolidated score of **62** %

Online Assignments	24.06/25	Proctored Exam	37.5/75

Total number of candidates certified in this course: 5166

Prof. Sanjeev Manhas
Coordinator, Continuing Education Centre
IIT Roorkee

Jan-Apr 2022
(12 week course)

Prof. Priti Maheshwari
NPTEL Coordinator
IIT Roorkee

Indian Institute of Technology Roorkee

swayam
FREE ONLINE EDUCATION

Roll No:NPTEL22CE22S33931572

To validate and check scores: https://nptel.ac.in/noc

Scanned with AltaScanner

CE - 2022-23

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

HOD, (CE)

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

CSE Student NPTEL Certificate 2022-23

2022-23 CSE NPTEL Certificate

2022-23 CSE NPTEL Certificate

Prof. Supriya Sawwashere
HOD. CSE
HOD
Computer Science & Engineering
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department Of Electrical Engineering
"Igniting minds to illuminate the world"
2022-23

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	1. To impart quality education in the field of Electrical Engineering. 2. To be excellent learning centre through research and industry interaction.

EE Student NPTEL Certificate 2022-23

NPTEL Certificate 2022-23 EE Department

H.O.D

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU & MSBTE Mumbai

Department Of Electrical Engineering

"Igniting minds to illuminate the world"

2022-23

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	1. To impart quality education in the field of Electrical Engineering. 2. To be excellent learning centre through research and industry interaction.

EE Student NPTEL Certificate 2022-23

NPTEL Certificate 2022-23 EE Department

H.O.D

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Electronics and Telecommunication Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23 (Even Sem)

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

ETC Student NPTEL Certificate 2022-23

2022-23 ETC NPTEL Certificate

2023 ETC NPTEL Certificate

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere

Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Affiliated to DBATU, RTMNU & MSBTE Mumbai

Department of Information Technology

"Progress Beyond Excellence"

Session: 2022-23

VISION	MISSION
" To Produce Competent Professionals equipped with technical knowledge and commitment for satisfying the needs of society "	1. To impart advanced knowledge with an inclination towards Research with well-equipped Labs. 2. To develop an ability to work ethically and Responsive towards the need of society.

IT Student NPTEL Certificate 2022-23

Figure 1NPTEL_IT_2022-23

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Affiliated to DBATU, RTMNU

2022-23

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering."	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skills and hard skills to achieve the institutional vision.

ME Student NPTEL Certificate 2022-23

NPTEL Online Certification
(Funded by the MoE, Govt. of India)

This certificate is awarded to

AADESH RAMESH TALMALE

for successfully completing the course

Mechanics of Solids

with a consolidated score of **43** %

Online Assignments	13.03/25	Proctored Exam	30/75

Total number of candidates certified in this course: **42**

Prof. B. V. Ratish Kumar
Chairman, Centre for Continuing Education
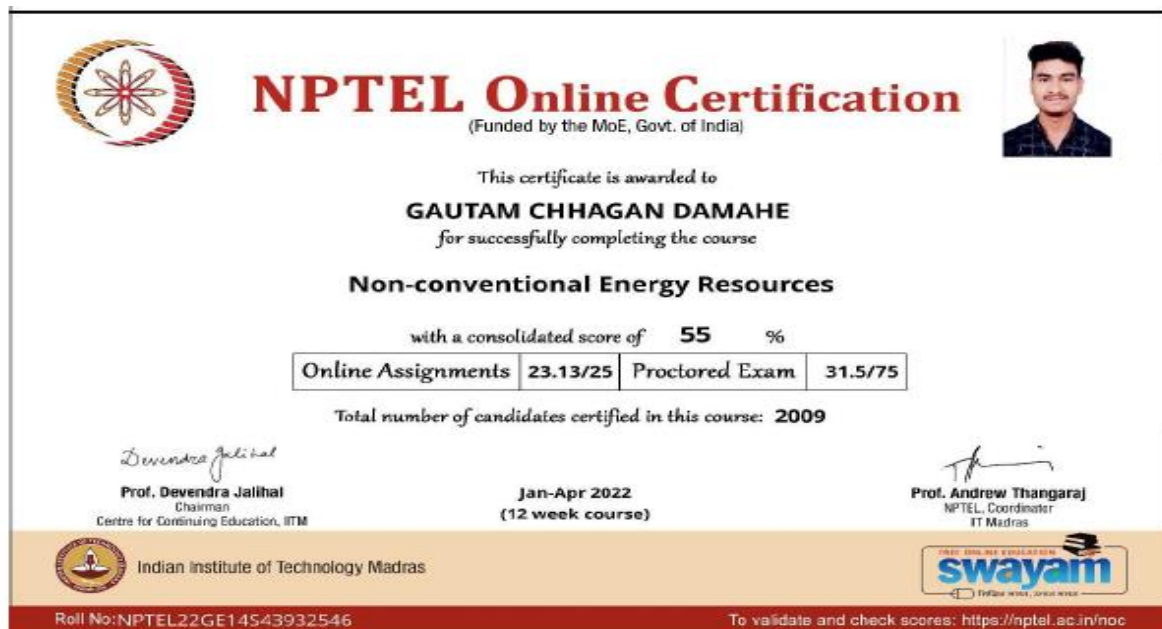IIT Kanpur

Jan-Apr 2022
(12 week course)

Prof. Satyaki Roy
NPTEL Coordinator
IIT Kanpur

Indian Institute of Technology Kanpur

swayam

Roll No:NPTEL22CE46S23931758

To validate and check scores: https://nptel.ac.in/noc

STUDENT NPTEL CERTIFICATE 2022-23

NPTEL Online Certification
(Funded by the MoE, Govt. of India)

This certificate is awarded to

GAUTAM CHHAGAN DAMAHE

for successfully completing the course

Non-conventional Energy Resources

with a consolidated score of **55** %

Online Assignments	23.13/25	Proctored Exam	31.5/75

Total number of candidates certified in this course: **2009**

Prof. Devendra Jalihal
Chairman
Centre for Continuing Education, IITM

Jan-Apr 2022
(12 week course)

Prof. Andrew Thangaraj
NPTEL, Coordinator
IT Madras

Indian Institute of Technology Madras

swayam

Roll No:NPTEL22GE14S43932546

To validate and check scores: https://nptel.ac.in/noc

STUDENT NPTEL CERTIFICATE 2022-23

Bhushan R.Mahajan
Head of Department,
DOME
JDCOEM Department
Mechanical Engineering
D College of Engineering & Management
Nagpur

JDCOEM
Department of Mech Engg

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Artificial Intelligence
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

AI Student NPTEL Certificate 2022-23

2022-23 AI NPTEL Certificate

2022-23 AI NPTEL Certificate

Prof. Supriya Sawwashere
HOD AI

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

MBA Student NPTEL Certificate 2022-23

Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to

AKSHAY M VINCHURKAR

for successfully completing the course

Principles of Management

with a consolidated score of **60** %

Online Assignments	25/25	Proctored Exam	34.5/75

Total number of candidates certified in this course: **4431**

Jul-Oct 2022

(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur

Indian Institute of Technology Kharagpur

swayam
FREE ONLINE EDUCATION

Roll No: NPTEL22MG104S63870633   To validate the certificate   No. of credits recommended: 3 or 4

1. MBA : 2022-23

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

NPTEL Online Certification
(Funded by the MoE, Govt. of India)

This certificate is awarded to

AKSHAY SUDHAKAR LEDE

for successfully completing the course

Customer Relationship Management

with a consolidated score of **53** %

Online Assignments	18.33/25	Proctored Exam	34.37/75

Total number of candidates certified in this course: **1558**

Aug-Oct 2022

(8 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur

Indian Institute of Technology Kharagpur

swayam
FREE ONLINE EDUCATION

Roll No: NPTEL22MG93S63871874   To validate the certificate   No. of credits recommended: 2 or 3

2. MBA : 2022-23

HOD- MBA

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Head
Dept. of Management Studies (MBA)
J.D. College of Engineering & Management
Nagpur

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

CSE Student Coursera Certificate 2022-23

2022-23 CSE Coursera Certificate

2022-23 CSE Coursera Certificate

Prof. Supriya Sawwashere
HOD. CSE
HOD
Computer Science & Engineering
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU
Department of Artificial Intelligence
"A Place to Learn, A Chance to Grow"
**Session: 2022-23**

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

AI Student Coursera Certificate 2022-23
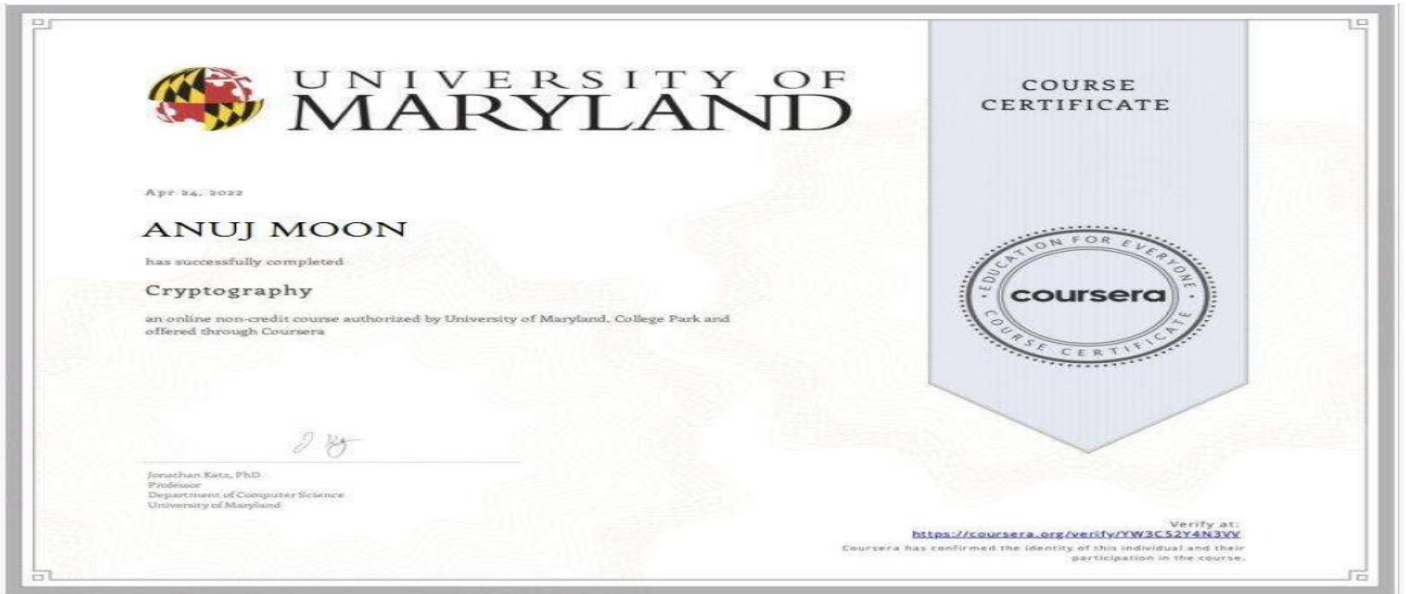
2022-23 AI Coursera Certificate

2022-23 AI Coursera Certificate

Prof. Supriya Sawwashere
HOD AI

HOD
Artificial Intelligence
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
JD COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Civil Engineering
"Building Better Development"
Session 2022-23

VISION	MISSION
To be a well-known center for shaping professional leaders of Global Standards in Civil Engineering	• Provide quality education and excellent learning Environment for overall development of students. • Making Sustainable efforts for integrating academics with Industry.

Student Internship Completion Cerificate   (CE)- 2022-23

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

HOD, (CE)

JAIDEV EDUCATION SOCIETY'S
JD COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Civil Engineering
"Building Better Development"
Session 2022-23

VISION	MISSION
To be a well-known center for shaping professional leaders of Global Standards in Civil Engineering	• Provide quality education and excellent learning Environment for overall development of students. • Making Sustainable efforts for integrating academics with Industry.

Indian Institute of Technology Bombay

Powai, Mumbai, Maharashtra, India.
https://www.iitb.ac.in/
Phone: +91 (22) 2572 2545, Fax: +91 (22) 2572 3480

CERTIFICATE OF INTERNSHIP

This is to certify that **Ms. Uttara N. Paithe** of J D College of Engineering and Management, Nagpur has successfully completed a project on *"Production of Biogas from Food and Agriculture Waste and Grey Water Treatment Systems"* as a part of SEED Summer Internship Program organized by TUM-IITB-SEED Centre from 05/06/2023 to 05/08/2023.

आभारम्

Prof. Anand B. Rao
Scientific Director, TUM-IITB-SEED Centre
Professor and Head, Centre for Technology
Alternatives for Rural Areas (CTARA)
IIT Bombay, Powai, Mumbai, India.

Federal Ministry for Economic Cooperation and Development

DAAD
Deutscher Akademischer Austauschdienst
German Academic Exchange Service

ex\ceed
EXCELLENCE CENTERS
FOR EXCHANGE AND DEVELOPMENT

S.E.E.D. CENTER

TUM-IITB-SEED Centre/ 2023/Intern/04
This certificate can be verified at 204358001@iitb.ac.in

Student Internship Completion Cerificate   (CE)- 2022-23

HOD, (CE)

Principal
Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department Of Electrical Engineering
"Igniting minds to illuminate the world"
2022-23

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	1. To impart quality education in the field of Electrical Engineering. 2. To be excellent learning centre through research and industry interaction.

भारत सरकार
रेल मंत्रालय
विद्युत लोको शेड, अजनी, मध्य रेल

प्रमाण-पत्र

प्रमाणित किया जाता है कि श्री/श्रीमती/कुमारी __पल्लवी शंकर मोरखड़े__
उक्त कि बी.ई/पॉलिटेक्नीक शाखा __इलेक्ट्रीकल__ सत्र __VIth sem__
संस्थान का नाम __जे. डी. कॉलेज ऑफ इंजीनियरिंग एण्ड मैनेजमेन्ट नागपुर__
ने प्रशिक्षण दिनांक __19.12.2022__ से दिनांक __24.12.2022__ तक प्राप्त किया है ।
प्रशिक्षण के दौरान इनका अनुशासन एवंम प्रशिक्षण के प्रति उत्सुकता सराहनीय है ।

मैं इनके उज्वल भविष्य के लिए शुभकामनाए देता हूँ ।

अनु.क्र - 3246
पत्र संख्या : वि.लो.शे/अजनी/बी.टी.सी/09
दिनांक : 24.12.2022

प्रशिक्षण पर्यवेक्षक के हस्ताक्षर

हस्ताक्षर

कृते वरिष्ठ मंडल विद्युत इंजीनियर
विद्युत लोको शेड, अजनी
नागपुर मंडल (मध्य रेल)

Internship Certificate 2022-23 EE Department

H.O.D

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**

(An Autonomous Institute, with NAAC "A" Grade)

Affiliated to DBATU, RTMNU & MSBTE Mumbai

Department Of Electrical Engineering
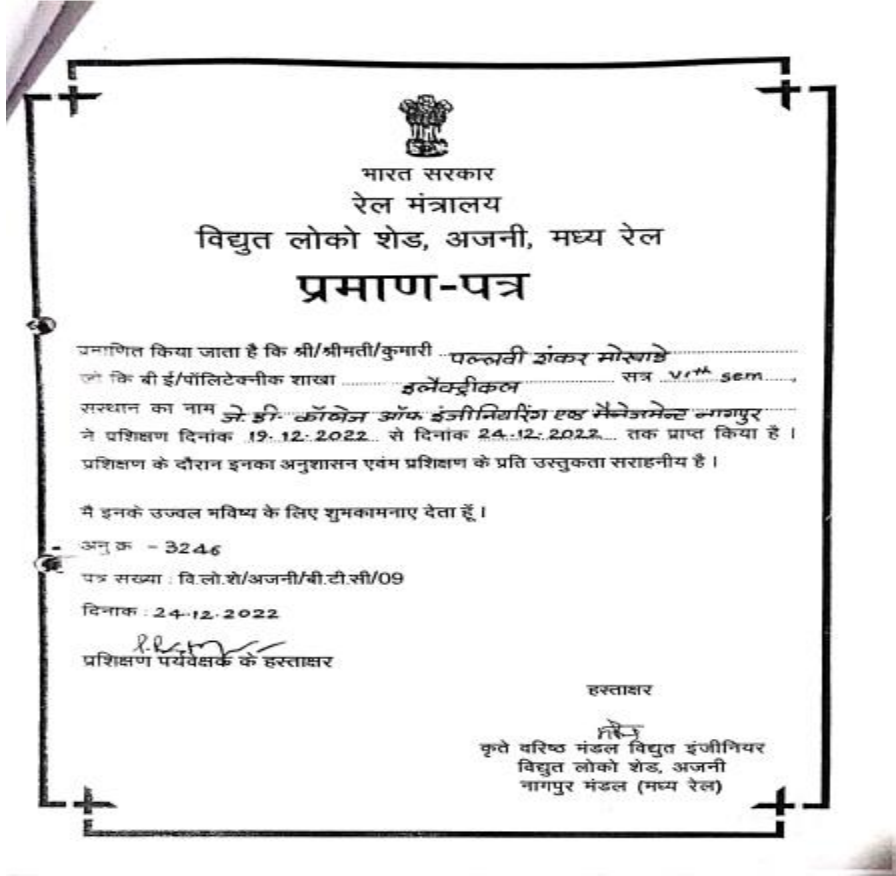
"Igniting minds to illuminate the world"

2022-23

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	1. To impart quality education in the field of Electrical Engineering. 2. To be excellent learning centre through research and industry interaction.

SONALI

POWER EQUIPMENTS PVT. LTD.
Manufacturer & Repairers of Transformers

FACT. : S-54, HINGNA, MIDC AREA, NAGPUR-440 016.

TIN NO. 27390204840 V w.e.f. 01.04.06
TIN NO. 27390204340 C w.e.f. 01.04.06

OFF. : FAX - 0712-2238440 FACT: 07104-237294
RESI. : 2238498 E-mail: sonalipowerequipments@gmail.com

CERTIFICATE

OF INPLANT TRAINING

THIS IS CERTIFY THAT HIS / HER. AKASH JAGNADE OF J.D. COLLEGE OF ENGINEERING & MANAGEMENT, NAGPUR OF 2ND YEAR IV SEM OF ELECTRICAL ENGINEERING ATTENNDED THE TRAINING FOR 15 DAYS (FIFTEEN DAYS) FROM 20.07.2022 TO 04.08.2022. DURING THE ABOVE-MENTIONED PERIOD HIS / HER CONDUCT AND PERFORMANCE WAS FOUND TO BE SATISFACTORY.

DATE: 04/08/2022

PLACE: NAGPUR.

9372309638

Yours faithfully,

FOR: SONALI POWER EQUIPMENTS PVT.LTD

Internship Certificate 2022-23 EE Department

H.O.D

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Department of Electronics Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

ETC Internship Certificate-2022-23

Page 1/1

De: 08/06/2023

Internship Offer Letter

Dear **Priyanshu Rangari**,

On behalf of **Clustor Computing**, we are excited to extend an offer to you for an internship position within our **Technology Department**. This position is located in Nagpur (MH). The position as an **INTERN**.

This position is scheduled to begin from 01/06/2023 and will continue till the program will be over. In this role, you will report directly to **Project Manager**.

Please be sure to bring:

1. Latest Passed Exam Marksheet
2. ID Proof
3. Address Proof
4. NOC Letter from College

with you on your first day to complete your profile.

Important Note: – During your temporary employment with Clustor Computing you may have access to trade secrets and confidential or proprietary business information belonging to Clustor Computing. By accepting this offer, you acknowledge that this information must remain confidential and agree to refrain from using it for your own purposes or disclosing it to anyone outside of Clustor Computing. Also, you agree that upon completion of your internship, you will promptly return any company-issued property and equipment along with information and documents belonging to the company. By accepting this offer, you acknowledge that you understand participation in this program is not an offer of employment, and successful completion of the program does not entitle you to an employment offer from Clustor Computing.

This offer letter represents the full extent of the internship offer and supersedes any prior conversations about the position. Changes to this agreement may only be made in writing. If you have any questions about this offer, please contact **Clustor Computing at +91-9545400369** in our recruiting department. Please review this letter in full, and sign and return it. We look forward to having you begin your career at Clustor Computing and wish you a successful internship. Welcome to our team!

Sincerely,

Ms. Mayuri Nerkar
HR Executive
Clustor Computing

Principal
. D. College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

I, **Mr. Priyanshu Rangari**, accept the above offer and will begin the internship position on 01/06/2023.

Sign
Priyanshu Rangari

Clustor Computing
📞 +91-7709291565, +91-9545400369
🌐 www.clustorcomputing.com   ✉ contact@clustorcomputing.com
84 pandurang gawande layout, Khamla, Nagpur, Maharashtra 440025

ETC Internship Certificate-2022-23

Dr. P. R. Kshirsagar
HOD, ETC
HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Department of Electronics Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

CLOUD IDE

Internship Letter
Ref: HRD/INTR/IDE002

DATE:
30 Oct 2023

TO:

Ankush Bhure

Nagpur, Maharashtra .

Dear Mr. Ankush Bhure,

This is certify that Mr. Ankush Bhure worked with our organization CloudIDE systems. He was a permanent full time Intern in our organization as a Designation Node JS Intern. He was posted in our office from 12 July, 2023.

We found Mr. Ankush Bhure very dedicated to the work assigned. He was result oriented, professional and sincere. He carries excellent interpersonal skill and knowledge which helped completing lot of valuable business assignments. He is a true team player and fun loving individual.

We wish him all the best for future ventures.

Ashay Sawarkar
CEO/Founder

77219-54116
contact@cloudidesys.com

Plot no. 1A, Shushila Society, Balbarodi near Rakesh layout 5, Nagpur 440027

Page 1/1

Dr. P. R. Kshirsagar
HOD, ETC
HOD, Dept. of EN/ETC
JD College of Engineering
& Management, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Affiliated to DBATU, RTMNU & MSBTE Mumbai

2022-23(

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering."	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skills and hard skills to achieve the institutional vision.

ME Internship Certificate-2022-23

Internship Offer Letter

Dear Jayendra Naik

12/11/2022

Congratulations!!

This is with reference to your application and subsequent interview held with you, We are pleased to offer you the position of " Java Intern " for "Softtronix IT Solution". Your compensation will be as agreed during our discussions. Your date of joining would be on or before 12/11/2022.

You are requested to carry a self - attested copy of the following documents.

1. One passport size photograph.

2. All Qualification Certificates.

3. Proof of residence & Aadhaar Card.

Request you to accept the offer latest by today. A detailed offer letter along with the terms and conditions of appointment applicable to you will be issued to you post the completion of the formalities .We welcome you to Softtronix IT Solution and wish you a rewarding career ahead .

Please feel free to get in touch with me at any time for any further information.

Thanking you,

From Softtronix IT Solution

SOFTTRONIX

Proprietor

Signature with Name& Designation

Director / Manager – Human Resources

Principal

J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

ME Internship Certificate-2022-23

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Affiliated to DBATU, RTMNU & MSBTE Mumbai

2022-23(

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering."	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skills and hard skills to achieve the institutional vision.

M/s. Advance Metal Scan Industries

Plot No. 121, Mohan Nagar, Lala Jai Narayan Marg, Behind St. Joseph Convent School, Nagpur - 440001
Land Line / Fax. No. 0712- 2558031, 9422804487, Email : bonymch77@gmail.com

Ref. No. AMSI/22-23/01/11   Dt. 21/11/2022

Internship/Training Conformation letter

To Whom so ever It may Concern

This is to Certify that **Mr. Kunal Ramkrishna Vanniyar**, studying in **B.E. Final Year (Mechanical Engineering)** student of J.D College of Engineering, Kalmeshwar road, Phata, Nagpur 441501 will start his internship programme /Training at **"M/s. Advance Metal Scan Industries, Nagpur"** from 01.12.2022 to 31.05.2023.

He will work as a part of our team during his training. We assure him our support for the professional development and growth for his future.
We wish him luck for the exciting new opportunity he will start with us.

Best wishes.

From Advance Metal Scan Industries

(Signature of the Authorized Signatory)
Designation: **Proprietor**

Date: 21.11.2022

Place : Nagpur

Advance Metal Scan Industries
Plot No. 121, Mohan Nagar,
Lala Jai Narayan Marg,
Behind St. Joseph Convent School,
NAGPUR - 440001

- Engineering construction services like civil construction of commercial and residential complex.
- Non Destructive Testing Services in Civil like UPV, rebound Hammer, Pull Test.
- Non Destructive Testing Services in Mechanical like UT, MPI, RT, DPT, VISUAL, HT.
- Laboratory Testing Services in Mechanical Testing & Chemical Testing (OES)

ME Internship Certificate-2022-23

Bhushan R.Mahajan
Head of Department,
DOME
JDCOEM Department
Mechanical Engineering
D College of Engineering & Management
Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

Education to Eternity

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

MBA: 2022-23

INTERNSHIP CERTIFICATES

ASSIST ME SOLUTIONS LLP

⦿ 2, Priti Society, Hajari Pahad, Nagpur.
✉ amsolutionsngp@gmail.com
🌐 www.assistme.in LLP ID : AAV-716-8

Date : 15-08-2022

INTERNSHIP OFFER LETTER

Dear **Sharad Ghangal,**

We are pleased to offer you Internship as **'Marketing Intern'** in our company. The standard duration of this internship is 4 Months, but in view of your academic deadlines of 45 days the initial internship offer shall be valid for 45 days only. You will be eligible to get an Experience Letter on the successful completion of your internship.

You will be earning monthly stipend of Rs. 3000/- during the internship period and additional petrol allowance shall be provided to you. Company reserves the right to withhold a partial amount if your efforts put-in are not upto the mark or found with any misconduct within the said time period.

Contractual agreement / Placement offer shall be conceded only after successful completion of initial internship. Placement offer shall depend on your performance and effort that has been put-in by you and shall be given the package as company deems fit for you. As per company policy, 1 month prior notice should be given by you, in-case of you are intending to leave the company. This offer letter do not carry any validity unless you are not completing the internship tenure and subsequently getting 'Internship Completion certificate' from the company.

Being a startup company, Company will work for 6 days a week and you are required to work for atleast 8 hours per day to finish your targets as set by the Marketing Manager.

Your date of Joining shall be from **16th August 2022**.

You are required to accept this internship offer letter by submitting joining letter.

Congratulations and welcome to the team!

Designated Partner
Assist Me Solution LLP
ASSIST ME SOLUTION LLP
LLP Identification No. AAV-716
PL. NO. 2, PRITI SOCIETY
HAZARI PAHAD, NAGPUR-440000

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

Education to Eternity

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

R. K. MAKHIJA & Co.

CHARTERED ACCOUNTANTS

Email: cmkassociateswarud@gmail.com
On Board: +91 7229 234405.
Cell No. : +91 9403114600.

CERTIFICATE

It is to certify that Mr. AMAR B. BODHALE S/o. SHRI BHAURAOJI S. BODHALE was working as MBA Intern with us M/s. R.K. MAKHIJA & CO. Chartered Accountant as Audit clerk from period 10th SEPTEMBER 2022 to 29TH OCTOBER 2022 as per the firm's employment record.

During his employment Mr. AMAR BHAURAOJI BODHALE has pursued knowledge & experience in field of Audit/Accounting /Goods & Services Tax (GST) etc. from our organization.

During his employment we found has to be Professional, knowledgeable and result oriented with theoretical & practical understanding of work requirements.

He is friendly & having good sense of humor and works well as individual or member of a team as required by management.

Overall Mr. AMAR BHAURAOJI BODHALE performed his duties and responsibilities cheerfully with attention to detail at all times. With his enthusiasm to work, learn and progress, I am certain that he would make a great employee to any enterprise.

We wish him all success in his future.
Date:-12/12/2022
Place :- Warud

For,
R.K. MAKHAIJA & CO.
CHARTERED ACCOUNTANT

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

CA. ROSHAN K. MAKHIJA.
(Proprietor)
Membership No. 169310.

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

TATA

Date: - 04th Nov, 2022

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Ms. Tejaswini Hatwar has completed her project internship with us during 19th Sep, 2022 and 04th Nov 2022 in "Finance" Department.

This certificate is issued to her to complete Academic Project formalities with her college.

For TATA Advanced Systems Limited,

Sachin Sovani
Senior Engineer — HR

All the best
Pavan
4/11/22

TATA ADVANCED SYSTEMS LIMITED
Corporate Identification No (CIN) U72900TG2006PLC077939
Nagpur Works. Sector - 10 MIHAN SEZ Nagpur - 441108 Phone No. +91-0712-6662888
Registered Office:- Hardware Park, Plot No. 21, SY No 1/1, Imrat Kancha, Raviryala Village.
Maheshwaram Mandal, Hyderabad - 501218, Telangana District
Website: www.tataadvancedsystems.com

Internship In- charge   **Academic Coordinator**   **HOD- MBA**

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Head
Dept of Management Studies (MBA)
J.D. College of Engineering & Management
Nagpur

VISION	MISSION
To lay a robust foundation for the institute to reach its zenith.	1. Achieving academic excellence through rigorous teaching, learning and evaluation practices. 2. To develop an ability to apply knowledge of basic science and mathematics to excel in the field of engineering. 3. To provide salutary environment for the betterment of faculty and students.

Subject: Engineering Physics
Subject Code: Cs/IT/AI/DS 1T 005

Assignment-I

Max Marks: 20   **Date:15.12.2022**

Q1   Explain with diagram : Absorption ,Spontaneous emission, and Stimulated emisssion of radiation

Q2   Describe construction and working of solid state He-Ne LASER with necessary energy level diagram. Explain why diameter of discharge tube is narrow?

Q3   What is acceptance angle for an optical fiber and derive its expression for an optical signal propagating through optical fiber.

Q4   Write difference between :1) Single mode and Multimode Fiber
                                   2) Step Index and Graded Index Fiber

Q5   Draw energy band diagram of n type and p type semiconductor at $0^{\circ}K$ and $300^{\circ}K$.

Q6   What is Hall effect. Derive an expression for Hall coefficient,Hall voltage,Hall angle and Hall mobility for an extrinsic semiconductor.Mentioned some application of Hall effect

Q7   What is Fermi energy . Derive an expression to show that Fermi energy lies in middle of band gap in intrinsic semiconductor.

Q8   What is thin film ? Obtain an expression for fringe width in wedge shaped thin film.

Q9   Expain the formation of Newton's ring and show that radius of nth dark ring is proportional to square root of wavelength of light used.

Q10   What are antireflection coating? Derive condition for minimum thickness of film for antireflection .

Last Date of Submission : 22.12.2022

Mr.U.V.Rathod,   Dr.A.N.Gupta,
Subject Teacher   HOD, BSHD,JDCOEM

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

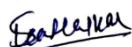| Vision	Mission
To lay a robust foundation for the Institute to reach its Zenith.	▪ Achieving academic excellence through rigorous teaching, learning and evaluation practices. ▪ To develop an ability to apply knowledge of basic science and Mathematics to excel in the field of Engineering. ▪ To provide salutary environment for the betterment of faculty and the students.

Assignment-I

Subject: SDC
Subject Code: MA1T001
Year/Semester: 1 st Semester (First Year)

Date: 11.01.2023   **Max Marks: 20**

Q.No.	Questions	Level/CO's	Marks
Q1	Solve for finding the missing terms in the following data. <table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>y</td><td>1</td><td>8</td><td>27</td><td></td><td>125</td></tr></table>	2/CO2	5
Q2	Solve $\frac{dy}{dx} = \frac{(y+1)}{(y+2)e^y - x}$	3/CO3	5
Q3	Analyze the rank of the following matrices $A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$	4/CO4	5
Q4	Test the consistency of the system $x + y + z = 3$, $x + 2y + 3z = 4$, $x + 4y + 9z = 6$ and solve, if consistent	4/CO4	5

Last Date of Submission : 20.01.2023

Mr.Sagar S. Kathalkar
Subject Teacher

Dr.A.N.Gupta,
HOD, BSHD,JDCOEM

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Basic Science and Humanities Department
Session- 2022-23
Semester-II

VISION	MISSION
To lay a robust foundation for the institute to reach its zenith.	1. Achieving academic excellence through rigorous teaching, learning and evaluation practices. 2. To develop an ability to apply knowledge of basic science and mathematics to excel in the field of engineering. 3. To provide salutary environment for the betterment of faculty and students.

Assignment-1		
Subject:Engineering Physics Branch:ME/CE/EE/ETC Date:04.04.2023		
Sr.No.	**Questions**	**COs**
Q1	Explain with diagram : Absorption , Spontaneous emission, and Stimulated emisssion of radiation	CO2
Q2	Describe construction and working of solid state He-Ne LASER with necessary energy level diagram. Explain why diameter of discharge tube is narrow?	CO3
Q3	What is acceptance angle for an optical fiber and derive its expression for an optical signal propagating through optical fiber.	CO2
Q4	Write difference between :1) Single mode and Multimode Fiber 2) Step Index and Graded Index Fiber	CO1
Q5	Draw energy band diagram of n type and p type semiconductor at 0°K and 300°K.	CO3
Q6	What is Hall effect. Derive an expression for Hall coefficient,Hall voltage,Hall angle and Hall mobility for an extrinsic semiconductor.Mentioned some application of Hall effect	CO4
Q7	What is Fermi energy . Derive an expression to show that Fermi energy lies in middle of band gap in intrinsic semiconductor.	CO4
Q8	What is thin film ? Obtain an expression for fringe width in wedge shaped thin film.	CO3
Q9	Expain the formation of Newton's ring and show that radius of nth dark ring is proportional to square root of wavelength of light used.	CO3
Q10	What are antireflection coating? Derive condition for minimum thickness of film for antireflection .	CO4

Last Date of Submission :   12.04.2023

Dr.U.V.Rathod,   Dr.A.N.Gupta,

Subject Teacher   **Principal**   HOD, BSHD,JDCOEM
                                                J D College of Engineering & Management
                                                    Khandala, Katol Road
                                                       Nagpur-441501

Vision	Mission
To lay a robust foundation for the Institute to reach its Zenith.	▪ Achieving academic excellence through rigorous teaching, learning and evaluation practices. ▪ To develop an ability to apply knowledge of basic science and Mathematics to excel in the field of Engineering. ▪ To provide salutary environment for the betterment of faculty and the students.

Assignment-I

Subject: Vector calculus and Probability

Subject Code: MA1T002

Year/Semester: 2nd Semester (First Year)

Date: 29.05.2023   **Max Marks: 20**

Q.No.	Questions	CO's	Marks
Q1	Examine all the values of $\left(\frac{1}{2} + \bar{\imath}\frac{\sqrt{3}}{2}\right)^{\frac{3}{4}}$ show that the continued product of all the values is 1.	2/CO2	5
Q2	In a certain college 25% of students failed in mathematics & 15% of the students failed in physics & 10% of the students failed in both the subjects A students is selected at random. (1). If he failed in mathematics. What is the probability that he failed in Physics? (2). What is the probability that her failed in mathematics or physics?	4/CO4	5
Q3	Solve & show that $\bar{\imath} \times (\bar{a} \times \bar{\imath}) + \bar{\jmath} \times (\bar{a} \times \bar{\jmath}) + \bar{k} \times (\bar{a} \times \bar{k}) = 2\bar{a}$	3/CO3	5
Q4	Test for the directional derivative of $\emptyset(x, y, z) = x^2 - 2y^2 + 4z^2$ at the point $C(1,1,-1)$ in the direction of $2\bar{\imath} + \bar{\jmath} - \bar{k}$. In what direction will the directional derivative is maximum? What is its magnitude?	4/CO4	5

Last Date of Submission :   10.06.2023

Ms.Prerna M.Parkhi,

Subject Teacher

Dr.A.N.Gupta,

HOD, BSHD,JDCOEM

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Assignment-

Semester/ Branch: - V Sem/ CSE   Subject Code:- CS5T002

Subject Name: - TCP/IP   Date of Display: 22/08/2023

Subject In-charge: Prof. Anuja Ghasad   Date of Submission: 31/08/2023

===

List of Assignment Question's:-

Que. No.	Questions	Unit No.	Topic Code	CO Mapping
1	Explain Network Architecture with its types.	1	T1.1	CO1
2	State & Explain types of Network Standards.	1	T1.2	CO1
3	Discuss different types of Connecting device in details.	1	T1.6	CO1
4	Differentiate between following a) LAN Vs WAN b) OSI Vs TCP/IP c) Extranet Vs Internet Vs Intranet d) Subnetting Vs Supernetting	1	T1.5/ T1.3/T2.3	CO1
5	Illustrate the following. a) Internet Backbones b) NAP c) ISPs d) RFCs	1	T1.6/ T1.7/ T1.8	CO1
6	Explain ARP and RARP with its working process.	2	T2.4/T2.5	CO2
7	Calculate weather following IP address is valid IP address block or not. a) 100.1.2.32 to 100.1.2.42 b) 192.1.1.47 to 192.1.1.60	2	T2.2	CO2
8	Describe Classful Internet address with its classes.	2	T2.1	CO2
9	Discuss DHCP with its component and working principle.	2	T2.6	CO2
10	Describe BOOTP.	2	T2.6	CO2

Prof. Anuja Ghasad   Prof. Swati Raut   Dr. Supriya Sawwashere
Subject In charge   **Dept. Academic Incharge**   **Dept. Head CSE**

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

HOD
Computer Science & Engineering
JDCOEM, Nagpur

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: **www.jdcoem.ac.in**   E-mail: **info@jdcoem.ac.in**
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department Of Electrical Engineering
"Igniting minds to illuminate the world"
2022-23 (Even Sem)

VISION	MISSION
"To develop competent and committed Electrical Engineers to serve the society"	1. To impart quality education in the field of Electrical Engineering. 2. To be excellent learning centre through research and industry interaction.

Assignment

Subject	Open Elective-II Basics of AutoCAD
Subject code	**EE6O002**
Semester/Year	VI/3rd
Unit No.	IV and V
Date of display	07/04/2023	Date of submission : 13/04/2023

Sr. No.	Question	Mapped Co
1.	Explain the various dimensions creation and editing methods.	CO4
2.	Discuss the various Layer list options.	CO4
3.	List out the step by step procedure to create and manage layers for Star –Delta circuit in AutoCAD.	CO4
4.	Examine the various tools and techniques used to create, store and reusing a block in AutoCAD.	CO5
5.	What is attribute in AutoCAD? Explain the attribute commands.	CO5

Subject teacher   Academic Incharge   HOD EE

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
An Autonomous Institute, with NAAC "A" Grade
Department of Electronics and Telecommunication Engineering
"Rectifying Ideas, Amplifying Knowledge"
2022-23 (Even Sem)

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1. To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2. To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Assignment   Date: 23/01/2023

Program: B. Tech in Electronics & Telecommunication

Course: Computer Networks & Cloud Computing

Course Code: ET6T003

Year/Semester: 6th Semester (3rd Year)

		(Level/CO)	Marks
Q .1	Analyze the Layers in the OSI Model.	4/CO1	5 M
Q.2	Explain different types of transmission media used for data communication.	2/CO2	5 M
Q.3	Illustrate different types of networks used for data communication.	2/CO1	5 M
Q.4	Analyze the Layers in TCP/IP Protocol Suite.	4/CO1	5 M
Q.5	Design a heterogeneous network made of four WANs and three LANs.	6/CO4	5 M

Date of Submission: 06/02/2023

Prof. Avinash K. Ikhar

**Course Coordinator /
Academic Incharge**

Dr. Pravin Kshirsagar

HOD (ETC)

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere

Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Department of Mechanical Engineering

2022-2023 (Odd Sem)

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering.".	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skill and hard skill to achieve institutional vision.
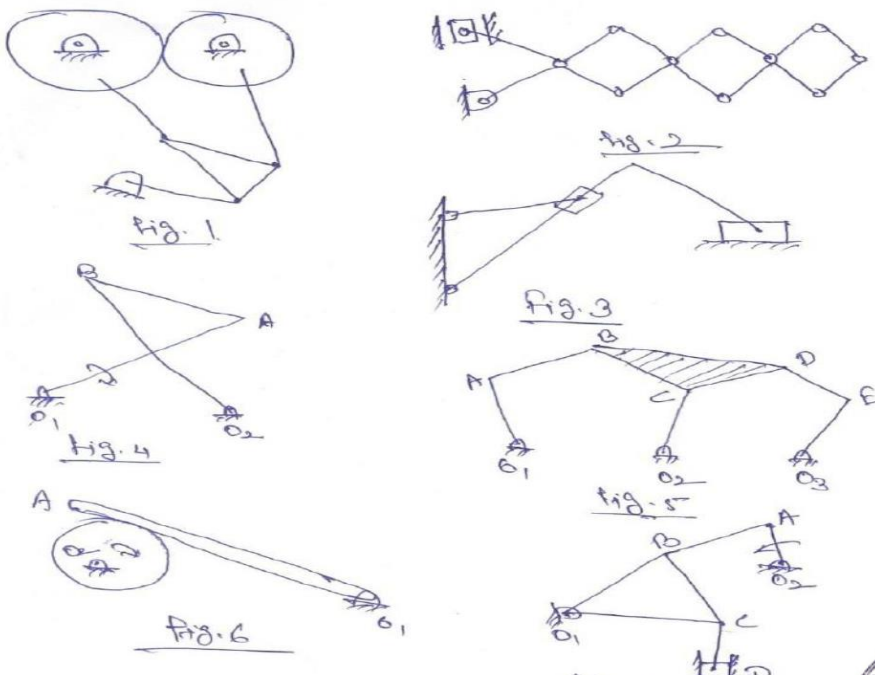
Assignment 1   **Date: 08/12/2022**

Course: B. Tech. in Mechanical Engineering

Subject: Theory Of Machine –I (TOM-I)

 Subject Code: ME3T005

Year/Semester: 3 th Semester (2nd Year)

Q. No.	Question	Level	CO	Marks
01.	Give the purpose and application of peaucellier mechanism, Geneva mechanism, and pawl and ratchet mechanism, transport mechanism?	1	1	10
02.	A plate clutch has three discs on the driving shaft and two discs on the driven shaft, providing four pairs of contact surfaces. The outside diameter of the contact surfaces is 240 mm and inside diameter 120 mm. Assuming uniform pressure and μ0.3; find the total spring load pressing the plates together to transmit 25 kW at 1575 r.p.m. If there are 6 springs each of stiffness 13 kN/m and each of the contact surfaces has worn away by 1.25 mm, find the maximum power that can be transmitted, assuming uniform wear.	1	1	10
03.	Define the cam terminology and types of clutches?	1	2	10
04.	Find the mobility	1,2	2	10

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S

J D COLLEGE OF ENGINEERING AND MANAGEMENT

KATOL ROAD, NAGPUR

Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere

Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in

An Autonomous Institute, with NAAC "A" Grade

Department of Mechanical Engineering

2022-2023 (Odd Sem)

VISION	MISSION
"To be a centre of excellence of learning and research in Mechanical Engineering.".	1. To provide high quality, innovative and research environment in Mechanical Engineering. 2. To impart soft skill and hard skill to achieve institutional vision.

| 05 | A cam, with a minimum radius of 25 mm, rotating clockwise at a uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below : **1.** To raise the valve through 50 mm during 120° rotation of the cam ; **2.** To keep the valve fully raised through next 30°; **3.** To lower the valve during next 60°; and **4.** To keep the valve closed during rest of the revolution i.e. 150° ; The diameter of the roller is 20 mm and the diameter of the cam shaft is 25 mm. Draw the profile of the cam when **(a)** the line of stroke of the valve rod passes through the axis of the cam shaft, and **(b)** the line of the stroke is offset 15 mm from the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion. Determine the maximum acceleration of the valve rod when the cam shaft rotates at 100 r.p.m. Draw the displacement, the velocity and the acceleration diagrams for one complete revolution of the cam. | 2 | 2 | 10 |

Date of Submission: 13/12/2022

Dr. M.P. Nimkar
Subject Teacher

Prof. Suhas A. Rewatkar
HOD
Head of Department
Mechanical Engineering
J D College of Engineering & Management
Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

Assignment

Semester/ Branch: - III Sem/ AI **Subject Code :-AI3T001**

Subject Name: - Organization Behaviour **Date of Display: 09/11/2022**

Subject In-charge: Prof. Anuja Ghasad **Date of Submission: 17/11/2022**

==

List of Assignment Question's:-

Que. No.	Questions	Unit No.	Topic Code	CO Mapping
1	Explain Organization Behaviour with its Approaches, Characteristics and Limitations.	1	T03, T04, T05, T06	CO1
2	Define Organization Model also explain types of Organization Behaviour Model.	1	T07	CO1
3	Explain Organization Culture with dimension and types.	1	T09, T11, T12	CO1
4	Discuss Impact of technology on organizational behaviour.	1	T08	CO2
5	Explain following term. a) Division of labour b) Delegation of authority c) Span of control	1	T15, T16, T17, T18, T21	CO2
6	Explain Communication with its Importance.	2	T22, T23	CO2
7	Discuss communication process and how to communicating within organizations.	2	T24, T25	CO2
8	Explain Technical Writing Process with types of Technical Documents	2	T31, T32	CO3
9	Explain the characteristics of Technical Communication.	2	T30	CO3
10	Discuss Interpersonal communication & Multicultural communication with Barriers to effective communication.	2	T26, T27, T28	CO3

Prof. Anuja Ghasad
Subject In charge

Prof. Swati Raut
Dept. Academic Incharge

Dr. Supriya Sawwashere
Dept. Head AI

HOD
Artificial Intelligence
JDCOEM, Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

Semester: - MBA II Semester **Subject Code:-2T3**

Subject Name: - Marketing Management **Assignment: 2022-23**

==

All Questions are Compulsory:

Q.1.A. National Bank Ltd. provides Irish customers with savings and investments, credit facilities, payment services and pensions. In January 2016 it launched its new home insurance facility 'PROTECTION', providing different policies, buildings and contents insurance options. It charges a reduced premium 30% off standard house insurance rates. Quotations (prices) can be obtained directly online. The facility "PROTECTION" had a high profile celebrity launch accompanied by an extensive advertising campaign. The Insurance market in Ireland is highly competitive however National Bank Ltd. plans to target a market share of 20% within two years.
Explain the product, price, promotion and place elements of the marketing mix. Relate your explanations to National Bank Ltd.

OR

Q.1.B. An established face cream manufacturing company is planning to launch its product in Indian market especially for Men. Suggest Marketing Mix which is best suitable.

Q.2.A. Explain Segmentation, Targeting & Positioning. Apply the concept of STP to Maggie, a Nestle Brand.

OR

Q.2.B. Explain all the phases of product life cycle with suitable example.

Q.3.A. Parle Agro is Planning to launch a new energy drink called "Masti". This is a new entrant in the growing market for drinks enhanced with stimulants to give consumers extra energy. Suggest a pricing strategy for Masti in each stage of PLC.

OR

Q.3.B. Discuss Pricing Decision. Explain the factors affecting price Determination.

Q.4.A. Explain various Distribution channel options for effective distribution of Coca Cola in India.

OR

Q.4.B. A well Garment firm wants to launch its new brand "T-shirt". What factors need to consider before considering a distribution channel.

Q.5.A. Develop a promotion mix for promoting a new brand "T-shirt" launched by Monte Carlo.

OR

Q.5.B. Define Sales Promotion? Explain various tools and technique with suitable example.

Subject In charge   **Dept. Academic Incharge**   **Dept. Head MBA**

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Head
Dept. of Management Studies (MBA)
J D College of Engineering & Management
Nagpur

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU

Education to Eternity

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

Semester: - MBA III Semester   **Subject Code:-3T6**

Subject Name: - Sales & Distribution Management   **Assignment: 2022-23**

==

All Questions are Compulsory:

Q1.A.Organizing the sales Management in your own words along with the significance of SM

Or

Q1.B. Estimating the Sales Planning & Control of fmcg.

Q2.A. Explaining the Sales Forecasting Method

Or

Q2.B.Determine the Personnel Selling and Sets of PS

Q3.A.Examine the various types of sales territory

Or

Q3.B. Prepare the Sales Budget for newly open juice company

Q4.A.Define Physical Distribution. Write importance of Physical Distribution.

Or

 Q4.B. Identifying the PD process

 Q5.A.State the Significance of Reverse Logistic. Discuss List the component of Supply Chain Management

Or

Q5.B. Write note on Electronic Intermediaries And also Explain the E-enabled logistic Management

Subject In charge   **Dept. Academic Incharge**   **Dept. Head MBA**

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Head
Dept. of Management Studies (MBA)
J D College of Engineering & Management
Nagpur

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

Semester: - MBA IV Semester   **Subject Code:-4T5**

Subject Name: - Retail Sales Management &   **Assignment: 2022-23**
Service Management

==
All Questions are Compulsory:

Q1.A. Explain Meaning of Retailing, Economic Significance of Retailing,

Or

Q1.B. Discuss the Criteria for Effective Segmentation

Q2.A. Discuss various Types of Retail Stores Location with suitable example

Or

Q2.B. Explain Factors Affecting Retail Location Decisions

Q3.A. Define Mechandising Management and discuss Activities of a Merchandiser,

Or

Q3.B. discuss Integrated Marketing Communication in Retail

Q4.A. discuss the concept and evolution of services marketing
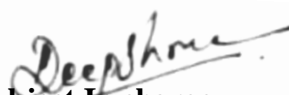
Or

Q4.B. 7Ps of service marketing with suitable example

Q5.A. meaning and Importance of Service Marketing

Or

Q5.B. Discuss managing quality Emerging Issues in Service Marketing

Subject In charge   **Dept. Academic Incharge**   **Dept. Head MBA**

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Head
Dept. of Management Studies (MBA)
J.D. College of Engineering & Management
Nagpur

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU& RTMNU
BASIC SCIENCE AND HUMANITIES DEPARTMENT
Subject:Engineering Physics
Question Bank

==

Q. No.	Questions
Q.1	How LASER is different than ordinary light?, comment.
Q.2	Write the comparision between Intrinsic & Extrinsic semiconductor.
Q.3	Write the condition for thin film as a antireflection coating?
Q.4	How crossed field configuration play a role of velocity selector? Explain.
Q.5	What are the conditions for the production of matter wave? Comment.
Q.6	Define void space in unit cell. Write its value for SC and BCC.
Q.7	Write any two application of optical fibre in communication.
Q.8	What is doping? What kind of doping in done to form N type of semiconductor?
Q.9	How wedge shape thin film form? Write at least one application of its experiment.
Q.10	What happened if electron is placed at rest posion in uniform Electric field E.
Q.11	Draw the schematic diagram of Newton;s ring Experiment.
Q.12	If atomic radius of BCC cell is 1.67 A, calculate its lattice constant.
Q.13	Explain the principal on which optical signal propagate through Optical fibre?
Q.14	Name the doping material for preparation of N type Semiconductor.
Q.15	Why the central spot is dark in Newton's Ring obtained due reflected light.
Q.16	Clarify the role of crossed field configuration as velocity filter?
Q.17	What are specifications of Simple cubic cell?
Q.18	What is the matter wave?
Q.18	At what thickness of thin film, reflected rays shows constructive interference pattern?
Q.19	What is co-ordination number for body centred cubic cell?
Q.20	What is mean of pumping in LASER?
Q.21	Justify the state of electron in uniform Magnetic field B when it is at rest initially.
Q.22	Explain, light is dual in nature.
Q.23	What is nos. of atoms per unit cell(Z) for FCC type of Cell
Q.24	What is optical fibre? Explain with diagram, the types of optical fibre based on index profile.
Q.25	Write down the note on 1)Drift current and 2) Diffusion current in semicunductor
Q.26	Fringes of equal thickness are observd in thin glass wedge of refractive index 1.52. The fringe spacing is 0.1mm, wavelength of light being 5893A. Calculate the wedge angle.
Q.27	What is de'Broglie hypothesis? Develop an equation for de'Broglie wavelength for an electron accelerated through potential of V volts is $\dfrac{12.26}{\sqrt{V}}$. A
Q.28	Interpret the motion of electron in transverse uniform magnetic field B and determine the expression for its radius and time period of circular path.

Q.29	Explain with neat sketches, the process of i)Spontaneous emission ii)Stimulated emission of light.
Q.30	Explain the following transition process with neat sketches and diagram 1)Spontaneous emission 2) Stimulated emission
Q.31	With neat sketches and band diagram, compare P and N-type semiconductor at room temperature.
Q.32	Why the Newton's Rings are circular? Comment. Calculate the radius of curvature of plano-convex lens in Newton's ring experiment if the radius of 10th dark ring is 5.2×10^{-4} m and monochromatic light of wavelength of 500×10^{-9} m is used.
Q.33	Explain the role of velocity Selector in Bainbridge mass spectrograph. Determine the magnitude of magnetic field B of velocity selector if the ions passing through it is un-deflected with velocity 5×10^3 m/s and electric filed applied across the plates is 500V/m..
Q.34	What is de'Broglie hypothesis? Develop an equation for de'Broglie wavelength for an electron accelerated through potential of V volts is $\dfrac{12.26}{\sqrt{V}}$. A
Q.35	What is Miller Indices? Draw following crystal planes in cubical cell having Miller Indices. i) (100), ii)(101) iii)(121)
Q.36	What is Atomic packing fraction? Show that FCC possess highest packing density compare to SC and BCC.
Q.37	**a)**What is Hall effect? Derive an expression for Hall Coefficient and Hall voltage. **b)** A copper strip of 1.5 mm thicknes is placed in normal magnetic field of 1.5 Tesla. If current of 2 A is set setup in the strip, calculate Hall voltage that appears across the strip. Assume $R_H = 6.5 \times 10^{-7}$ m^3/C.
Q.38	Explain the construction and working of He-Ne LASER with necessary energy level diagram.
Q.39	Derive an expression for the radius, time period, frequency and pitch for an electron moving with an angle ø in magnetic field.
Q.40	What is wedge shape thin film? Obtain an expression for the determination of thickness of thin paper using wedge shape thin film experiment.
Q.41	**a)** Discuss the effect of increasing amount of dopants on the Fermi level in Extrinsic semiconductors. **b)** Find the conductivity of Intrinsic Silicon at 300 ^{0}K. Given that Intrinsic carrier density is 1.45×10^{16} m^{-3} and electron and holes mobility is 0.47 and 0.012 m^{2}V^{-1}.s^{-1} respectively.
Q.42	What is Fermi energy? Show that Fermi energy is lies in the middle of Band gap of an intrinsic semiconductor with expression and neat sketches.
Q.43	What is fringe width? Obtain an expression for fringe width in a wedge shape thin film experiment. Comment, why the fringes are straight and parallel?
Q.44	Comment, how electron follows helical path in uniform Magnetic field? Derive an expression for radius of Circular path in helix, Pitch of the helix and Time period of revolution of circular path in helix.
Q.45	What is Heisenberg Uncertainty Principal? Show that electron cannot exist inside the nucleus.

Q.46	Define the term Inter-planner spacing d_{hkl}. Derive an expression for it in Cubic unit cell. Calculate Inter-planner spacing for BCC cell having atomic radius 1.565 A for plane of Miller indices (121).
Q.47	Explain the construction and working of the Ruby LASER with its energy level diagram and neat sketches.
Q.48	a)Define the term i)Acceptance angle ii)Acceptance cone iii)Numerical Aperture iv) Fractional Refractive index change (Δ). Show that Numerical aperture N.A $.= n_1\sqrt{2.\Delta}$ **b)**A step-index fibre has a core and cladding R.I. of 1.5 and 1.4 respectively, calculate N.A. and Acceptance anglee.
Q.49	**a)**What is Hall Effect? Derive an expression for Hall coefficient, Hall voltage, Hall angle and Mobility with necessary diagram for P-type semiconductor. Write one application of Hall effect. **b)**A P-type germanium sample has a Acceptor density of 10^{21} m^{-3}. It is arranged in Hall experiment having magnetic field of 0.15 Tesla. If current of 2.5 x 10^{-2} Amp is passed through a sample of thickness 3 mm, find the Hall coefficient and Hall voltage.
Q.50	a)What is wave function Ψ? Derive an expression for Schrodinger's time independent wave equation of motion. b)Calculate the de'Broglie wavelength of wave associated with particle of mass 1 gm and electron moving with velocity of 3 x 10^6 m/s. Give your conclusion for both paricles.
Q.51	**a)** Outline the construction of Optical fibre and build a relationship of acceptance angle with Numerical aperture with suitable diagram. **b)** An optical fibre has core material of refractive index of 1.55 and cladding and cladding material rfractive index 1.50. The light is launched into a fibre from air. Calculate Numeriacal Aperture and Acceptance angle.
Q.52	a)What is Interplanner spacing d_{hkl}? Derive an expression for Interplanner spacing d_{hkl} in Cubic system with necessary diagram. b) Molybdenum has BCC structure. Its density is 10.2 x 10^3 kg/m^3 and its atomic weight is 95.4. Determine the radius of Molybdenum atom.
Q.53	a)What is wave function Ψ? Derive an expression for Schrodinger time independent wave equation of motion. b)Calculate the de'Broglie wavelength of wave associated with electron possesses the maximum kinetic energy of 4 MeV.

Mr.U.V.Rathod,
Subject Teacher

Dr.A.N.Gupta,
HOD, BSHD,JDCOEM

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

Question Bank

Semester/ Branch: - V Sem/ CSE　　　　**Subject Code:-CS5T002**

Subject Name: -TCP/IP　　　　**Subject In-charge: Prof. Anuja Ghasad**

===

Que. No	Questions	Unit	Marks
1	Write short note on TCP/IP.	**Unit-I**	2
2	State & Explain types of Network Standards.	Unit-I	2
3	Explain ISP with its levels.	Unit-I	2
4	Explain Internetworking in short.	Unit-I	2
5	Write short note on Internet Backbone	Unit-I	2
6	Write difference between TCP/IP and OSI.	Unit-I	2
7	Name the protocols which are used in Network Access Layer and Internet layer.	Unit-I	2
8	Write short note on Internet and Intranet.	Unit-I	2
9	State & Explain types of Network Architecture Design.	Unit-I	2
10	Distinguish between MAN and WAN.	Unit-I	2
11	Explain Internetwork Addressing.	Unit-I	2
12	Write on Internet Protocol in short.	Unit-I	2
13	Write the types of LAN.	Unit-I	2
14	Classify the component of Network Architecture Design.	Unit-I	2
15	Write short note on Network Access Point.	Unit-I	2
16	Enlist different types of Connecting Devices.	Unit-I	2
17	Compare OSI and TCP/IP model.	Unit-I	2
18	Explain TCP/IP Model with its layers.	Unit-I	4
19	Discuss following different types of Connecting device (any 4) a) NIC b) Media Convertor c) Bridge d) Gateways e) Hub	Unit-I	4
20	Illustrate NAP with its benefits.	Unit-I	4
21	Examine component of Network Architecture Design .	Unit-I	4
22	Distinguish between Internet, Intranet and Extranet.	Unit-I	4
23	Explain TCP/IP Model with its advantages and disadvantages in details.	Unit-I	4
24	Illustrate Network Architecture with its types in details.	Unit-I	4
25	Discuss TCP/IP Model with its advantages.	Unit-I	4
26	Distinguish between Extranet, Intranet and Internet.	Unit-I	7
27	Explain Network Architecture with its types.	Unit-I	7
28	Illustrate the any seven types of Connecting Devices.	Unit-I	7
29	Compare Extranet, Intranet and Internet.	Unit-I	7

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
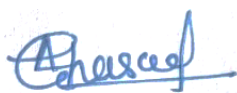### Session: 2022-23

	VISION	MISSION		
	To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.		

30	Illustrate the following. a) Internet Backbones b) NAP c) ISPs d) RFCs	Unit-I	12
31	Distinguish between following a) MAN Vs WAN b) Subnetting Vs Supernetting c) ARP Vs RARP	Unit-I	12
32	Discuss different types of Connecting device in details.(any six)	Unit-I	12
33	Find the classes of following address: a) 14.23.120.8 b) 1110001 11111111 00011011 11110001	**Unit-II**	2
34	Enlist the limitations of Classful addressing.	Unit-II	2
35	Explain Bootstrap Protocol.	Unit-II	2
36	Distinguish between MAN and WAN.	Unit-II	2
37	Explain Classful Internet address	Unit-II	2
38	Write short note on ICMP.	Unit-II	2
39	Define Netid and Hostid.	Unit-II	2
40	State the class of 111111111 00011001 00011101 00011101.	Unit-II	2
41	Explain BOOTP.	Unit-II	2
42	Describe the Address Resolution Protocols.	Unit-II	2
43	Rewrite RARP with its operation.	Unit-II	2
44	Find the class of IP address 14.23.120.8 and 252.5.15.111.	Unit-II	2
45	Check weather 100.1.2.32 to 100.1.2.47 is a valid IP Address block or not.	Unit-II	2
46	Write short note on ARP and RARP.	Unit-II	4
47	Distinguish between Subnetting and Supernetting.	Unit-II	4
48	Describe DHCP component.	Unit-II	4
49	Write short note on ARP and RARP.	Unit-II	4
50	Calculate whether following IP address is valid IP address block or not. 125.1.3.22 to 125.1.3.86	Unit-II	4
51	Describe Classful Internet address with its types.	Unit-II	4
52	Explain Classful Internet Address with its classes in details.		
53	Illustrate DHCP with its work and component.	Unit-II	4
54	Explain ARP and RARP with its working process.	Unit-II	7
55	Calculate weather following IP address is valid IP address block or not. a) 100.1.2.32 to 100.1.2.42 b) 192.1.1.47 to 192.1.1.60 c) 125.1.3.22 to 125.1.3.86	Unit-II	7
56	Discuss DHCP with its component and working principle.	Unit-II	7

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

VISION	MISSION
To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.	1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities. 2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program. 3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

57	Examine CIDR with its rules and examples.	Unit-II	7
58	Calculate whether following IP address is valid IP address block or not. a) 100.1.2.32 to 100.1.2.42 b) 192.1.1.47 to 192.1.1.60 c) 125.1.3.22 to 125.1.3.86	Unit-II	12
59	Define IP Datagram	**Unit-III**	2
60	Discuss IP Package.	Unit-III	2
61	Discuss RIP Message Format.	Unit-III	2
62	Draw IP Datagram Message Format.	Unit-III	2
63	Write short note on IGMP and ICMP.	Unit-III	2
64	Write short note on IP Package.	Unit-III	2
65	State the 3 way of handshakes in TCP.	Unit-III	2
66	Enlist the Services of TCP	Unit-III	2
67	Explain Computing Path in short.	Unit-III	2
68	Draw & explain the IP Datagram format.	Unit-III	2
69	Explain IP forwarding Algorithm.	Unit-III	2
70	Draw TCP header format	Unit-III	2
71	Discuss connection termination in TCP.	Unit-III	2
72	Describe RIP with tis work and message format.	Unit-III	7
73	Explain IP Routing Algorithm with its types in details.	Unit-III	7
74	Describe OSPF with its link and packet types.	Unit-III	7
75	Discuss RIP Message Format.	Unit-III	7
76	Illustrate IP Forwarding and Routing algorithm with its types in details.	Unit-III	7
77	Explain IP Datagram with its Message Format.	Unit-III	7
78	Describe RIP with its working Process and Message Format.	Unit-III	7
79	Discuss IP Forwarding and Routing Algorithms in details.	Unit-III	7
80	Examine OSPF with its Work, Link, Packet and Message Format.	Unit-III	7
81	Illustrate the following. e) IP Package f) Computing Paths g) ICMP h) IGMP	Unit-III	7
82	Illustrate IP Forwarding and Routing algorithm with its types in details.	Unit-III	12
83	Write short note on following a) RFC's b) ICMP c) IP Package d) Computing Path	Unit-III	12
84	Explain Bulk Data flow.	**Unit-IV**	2

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU & MSBTE Mumbai
Department of Computer Science & Engineering
"A Place to Learn, A Chance to Grow"
Session: 2022-23

	VISION		MISSION	

To be recognized for excellent engineering, developing global leaders both in educational and research in the domain of computer science and wireless engineering.

1. To create self-learning environment by facilitating leadership qualities, team spirit and ethical responsibilities.
2. To improve department-industry collaboration, interaction with professional society through technical knowledge and internship program.
3. To promote research and development with current techniques through well qualified resources in the area of computer science and wireless engineering.

85	Define Flow Control.	Unit-IV	2
86	State types of TCP Timer.	Unit-IV	2
87	Enlist the Services of TCP.	Unit-IV	2
88	Explain Congestion control in short.	Unit-IV	2
89	Explain Interactive Data flow with diagram.	Unit-IV	4
90	Examine TCP Timer with its types.	Unit-IV	4
91	Write short note on TCP Timer.	Unit-IV	4
92	Explain Interactive Data flow with diagram.	Unit-IV	4
93	Illustrate packet re-transmission process with diagram.	Unit-IV	4
94	Examine the services of TCP.	Unit-IV	7
95	Explain TCP Header with its Message Format.	Unit-IV	7
96	Explain Flow control and Retransmission in TCP.	Unit-IV	7
97	Examine Bulk Data Flow with diagram and Components.	Unit-IV	7
98	Explain TCP Header with its Message Format.	Unit-IV	7
99	Examine Bulk Data Flow with diagram and Components..	Unit-IV	7
100	Describe Interactive Data Flow and Bulk Data Flow.	Unit-IV	7
101	Illustrate the 3 way and 4 way of Handshake in TCP with diagram.	Unit-IV	12
102	Illustrate how connection establishes and terminated in TCP with diagram	Unit-IV	12
103	Explain Connection Establishment and Termination in TCP/IP.	Unit-IV	12
104	Discuss the following. d) TCP Header e) TCP Timers f) Urgent Data Processing g) Congestion Control h) Extension Headers	Unit-IV	12
105	Write short note on Switching technology.	**Unit-V**	2
106	Explain MPLS fundamentals.	Unit-V	2
107	Define Signaling Protocols, ,	Unit-V	2
108	Discuss LDP, ECMP & SBR.	Unit-V	4
109	Describe IP traffic engineering.	Unit-V	4
110	Explain Routing extensions for traffic engineering.	Unit-V	7
111	Illustrate Traffic engineering limitations and future developments.	Unit-V	7

Prof. Anuja Ghasad
Subject In charge

Prof. Swati Raut
Dept. Academic Incharge

Dr. Supriya Sawwashere
Dept. Head CSE

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

HOD
Computer Science & Engineering
JDCOEM, Nagpur

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

MBA 1st Semester
Question Bank: Managerial Economics

Academic Year 2022-23

1. If price of coffee rises from Rs.45 per 250 g pack to Rs.55 per 250 g pack and as a result the consumers demand for tea increases from 600 packs to 800 packs of 250 g, then find the cross elasticity of demand of tea for coffee.

2. Suppose the following demand function for coffee in terms of price of tea is given. Find out the cross elasticity of demand when price of tea rises from Rs.50 per 250 g pack to Rs.55 g per 250g pack. Qc =100 + 2.5Pt. Where Qc is the quantity demanded of coffee in terms of packs of 250 grams and Pt is the price of tea.

3. What are the economies and diseconomies of scale for Indian Railways, according to you? Elaborate each of them.

4. Explain Laws of return to scale. Relate laws of return to scale with Cobb Douglas production function.

5. Analyze various stages of Law of Variable Proportions along with its Assumptions. Also analyze in which stage rational decision is possible.

6. For a perfectly competitive firm, the following short-run function is given TC=2+4Q+Q2

7. If price of the product prevailing in the market is Rs. 8 at what level of output the firm will maximize profits?

8. Explain the meaning of inflation in Indian Context and extend its types causes and effects.

9. Explain effects of inflation on distribution of Income and wealth

10. Suppose the level of autonomous investment in an economy is Rs. 200 crores. The following saving function is given: S = - 80 + 0.25Y. Find the equilibrium level of Income.

11. What are the Phases of the Business Cycle? Illustrate various factors causing swings in business activity and measures to control business cycles.

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

HOD MBA

Subject – Solar PhotoVoltic Devices
6th Sem EE
Topic – PV Cell

The **Solar Cell I-V Characteristic**

The current and voltage (I-V) characteristics of a particular photovoltaic (PV) cell, module or array. It gives a detailed description of its solar energy conversion ability and efficiency. Knowing the electrical I-V characteristics (more importantly P_{max}) of a solar cell, or panel is critical in determining the device's output performance and solar efficiency.

Photovoltaic solar cells convert the suns radiant light directly into electricity. With increasing demand for a clean energy source and the sun's potential as a free energy source, has made solar energy conversion as part of a mixture of renewable energy sources increasingly important. As a result, the demand for efficient solar cells, which convert sunlight directly into electricity, is growing faster than ever before.

Photovoltaic (PV) cells are made almost entirely from semiconductor silicon that has been processed into an extremely pure crystalline material which absorbs the photons from sunlight.

The photons hit the sillicon atoms releasing electrons causing an electric current to flow when the photoconductive cell is connected to an external load. For example, a battery. There are a variety of different measurements we can make to determine the solar cell's performance, such as its power output and its conversion efficiency.

The main electrical characteristics of a PV cell or module are summarized in the relationship between the current and voltage produced on a typical solar cell I-V characteristics curve. The intensity of the solar radiation (insolation) that hits the cell controls the current (I), while the increases in the temperature of the solar cell reduces its voltage (V).

Solar cells produce direct current (DC) electricity and current times voltage equals power, so we can create solar cell I-V curves representing the current versus the voltage for a photovoltaic device.

Solar Cell I-V Characteristics Curves are basically a graphical representation of the operation of a solar cell or module summarising the relationship between the current and voltage at the existing conditions of irradiance and temperature. I-V curves provide the information required to configure a solar system so that it can operate as close to its optimal peak power point (MPP) as possible.

Solar Cell I-V Characteristic Curve
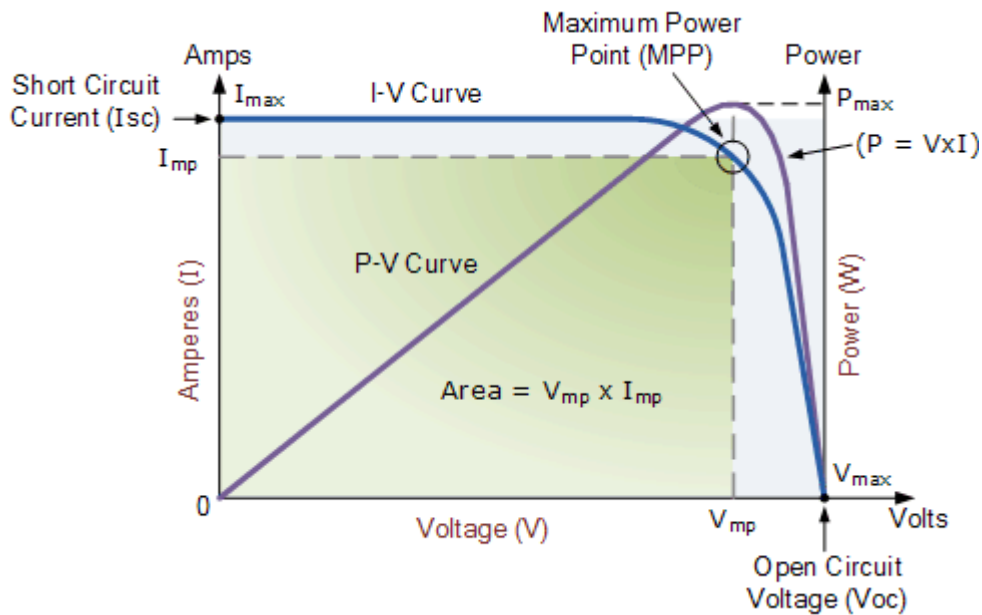
The above graph shows the current-voltage (I-V) characteristics of a typical silicon PV cell operating under normal conditions. The power delivered by a single solar cell or panel is the product of its output current and voltage (I x V). If the multiplication is done, point for point, for all voltages from short-circuit to open-circuit conditions, the power curve above is obtained for a given radiation level.

With the solar cell open-circuited, that is not connected to any load, the current will be at its minimum (zero) and the voltage across the cell is at its maximum, known as the solar cells **open circuit voltage**, or Voc. At the other extreme, when the solar cell is short circuited, that is the positive and negative leads connected together, the voltage across the cell is at its minimum (zero) but the current flowing out of the cell reaches its maximum, known as the solar cells **short circuit current**, or Isc.

Then the span of the solar cell I-V characteristics curve ranges from the short circuit current (Isc) at zero output volts, to zero current at the full open circuit voltage (Voc). In other words, the maximum voltage available from a cell is at open circuit, and the maximum current at closed circuit. Of course, neither of these two conditions generates any electrical power, but there must be a point somewhere in between were the solar cell generates maximum power.

However, there is one particular combination of current and voltage for which the power reaches its maximum value, at Imp and Vmp. In other words, the point at which the cell generates maximum electrical power and this is shown at the top right area of the green rectangle. This is the "maximum power point" or **MPP**. Therefore the ideal operation of a photovoltaic cell (or panel) is defined to be at the maximum power point.

The maximum power point (MPP) of a solar cell is positioned near the bend in the I-V characteristics curve. The corresponding values of Vmp and Imp can be estimated from the open circuit voltage and the short circuit current: Vmp $\cong$ (0.8–0.90)Voc and Imp $\cong$ (0.85–0.95)Isc. Since solar cell output voltage and current both depend on temperature, the actual output power will vary with changes in ambient temperature.

Photovoltaic Cell and its simple model :

A photovoltaic cell is comprised of many layers of materials, each with a specific purpose. The most important layer of a photovoltaic cell is the specially treated semiconductor layer. It is comprised of two distinct layers (p-type and n-type), and is what actually converts the Sun's energy into useful electricity through a process called the photovoltaic effect. On either side of the semiconductor is a layer of conducting material which "collects" the electricity produced. Note that the backside or shaded side of the cell can afford to be completely covered in the conductor, whereas the front or illuminated side must use the conductors sparingly to avoid blocking too much of the Sun's radiation from reaching the semiconductor. The final layer which is applied only to the illuminated side of the cell is the anti-reflection coating. Since all semiconductors are naturally reflective, reflection loss can be significant. The solution is to use one or several layers of an anti-reflection coating (similar to those used for eyeglasses and cameras) to reduce the amount of solar radiation that is reflected off the surface of the cell.
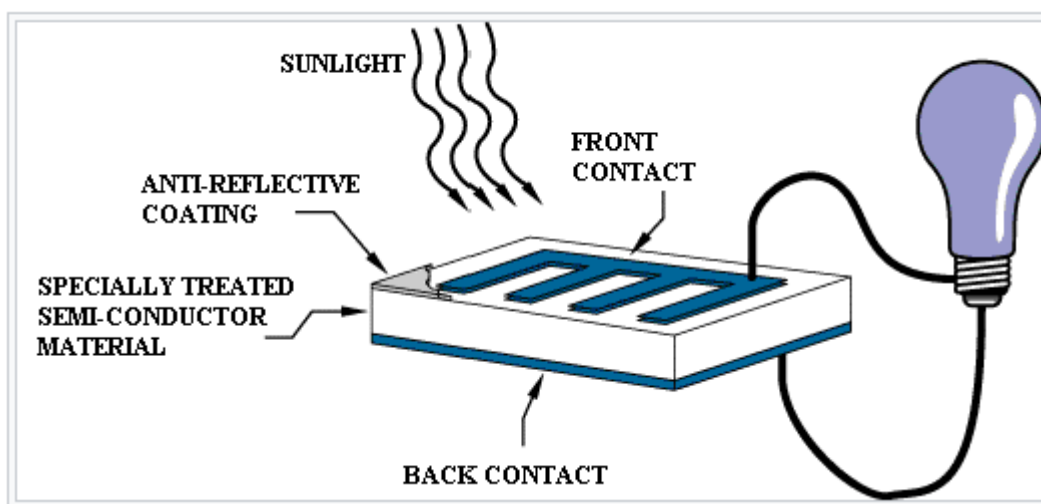
Photovoltaic effect

The **photovoltaic effect** is a process that generates voltage or electric current in a photovoltaic cell when it is exposed to sunlight. These solar cells are composed of two different types of semiconductors—a p-type and an n-type—that are joined together to create a **p-n junction**. By joining these two types of semiconductors, an electric field is formed in the region of the junction as electrons move to the positive p-side and holes move to the negative n-side. This field causes negatively charged particles to move in one direction and positively charged particles in the other direction. Light is composed of photons, which are simply small bundles of electromagnetic radiation or energy. When light of a suitable wavelength is incident on these cells, energy from the photon is transferred to an electron of the semiconducting material, causing it to jump to a higher energy state known as the conduction band. In their excited state in the conduction band, these electrons are free to move through the material, and it is this motion of the electron that creates an electric current in the cell
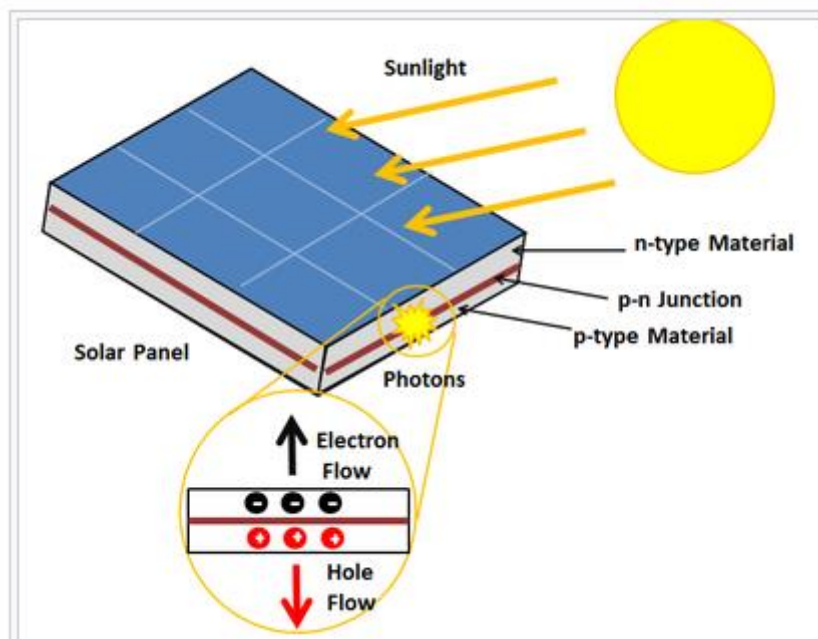
Photovoltaic Effect

Cells, Modules, Panels and Arrays

Photovoltaic cells are connected electrically in series and/or parallel circuits to produce higher voltages, currents and power levels. Photovoltaic modules consist of PV cell circuits sealed in an environmentally protective laminate, and are the fundamental building blocks of PV systems. Photovoltaic panels include one or more PV modules assembled as a pre-wired, field-installable unit. A photovoltaic array is the complete power-generating unit, consisting of any number of PV modules and panels.
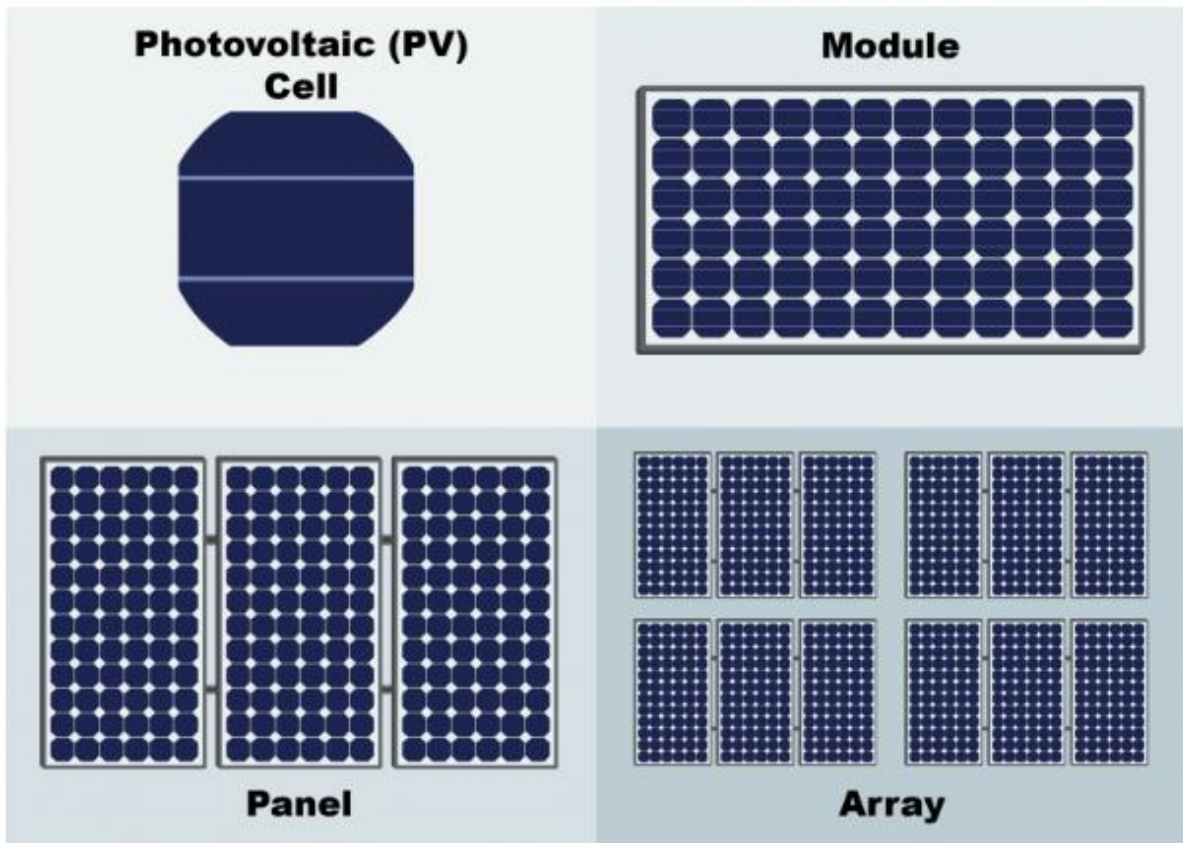
What is PV module?

You might be questioning, what is PV module?
A PV module is also known as photovoltaic modules. A photovoltaic module is used as an energy power system, its function is to provide feasible energy and solar power through the use of the photovoltaics feature.
PV modules help absorb energy from the sun's rays and generate it as electrical power.

Each photovoltaic modules are ranging from different sizes and each of these sizes is equivalent to a certain amount of kilowatts and energy that it can take and generate. You can choose between the two choices of small PV modules which are the rooftop-mounted or building-integrated PV modules.

There are also large PV modules that are more suitable for utility power sites. Make sure to check first your roof to know what size and capacity of solar energy does your house needed.

PV module or solar panels can be last for 25 to 30 years, this only means that investing in a quality PV module is suitable for long-term uses.

What is PV array?

PV array is the short term used for the photovoltaic array. If a PV module is used to absorb and generate electricity, the PV array on the other hand is the full energy generating equipment that is composed of a different number of panels of a PV module.

PV array is connected and that is the reason why the PV module can function and can produce electricity. Each small PV array is composed of one module.

A PV array only produces one standard size which is 156 mm x 156mm.

To sum up the idea, a PV array is an interconnected PV module that helps it to gain energy from the rays of the sun and transmit it as electricity.

A solar module designed for charging a 12 volt battery will typically have 36 solar cells while the typical residential grid connected system uses solar modules with 60 solar cells. For large commercial and utility scale solar systems, solar modules will have typically 72 solar cells. By increasing the number of solar cells the module voltage and wattage increases.

A Solar Photovoltaic Module is available in a range of 3 W_P to 300 W_P. But many times, we need power in a range from kW to MW. To achieve such a large power, we need to connect N-number of modules in series and parallel.

A String of PV Modules

When N-number of PV modules are connected in series. The entire string of series-connected modules is known as the PV module string. The modules are connected in series to increase the voltage in the system. The following figure shows a schematic of series, parallel and series parallel connected PV modules.
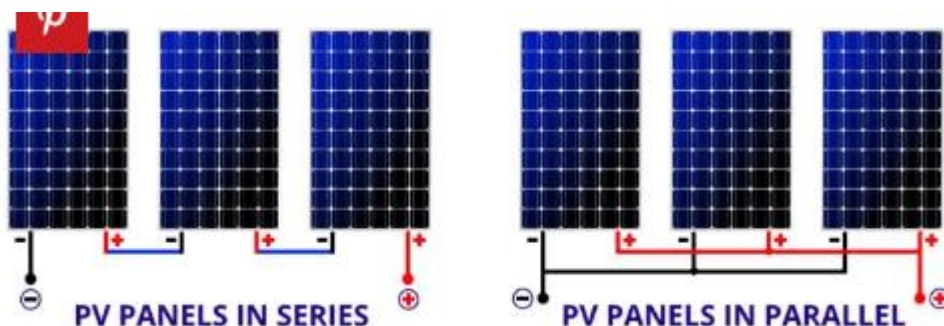
PV Module Array

To increase the current N-number of PV modules are connected in parallel. Such a connection of modules in a series and parallel combination is known as "Solar Photovoltaic Array" or "PV Module Array".

A schematic of a solar PV module array connected in series-parallel configuration is shown in figure below.

Wiring Solar Panels in Series-Parallel Configuration
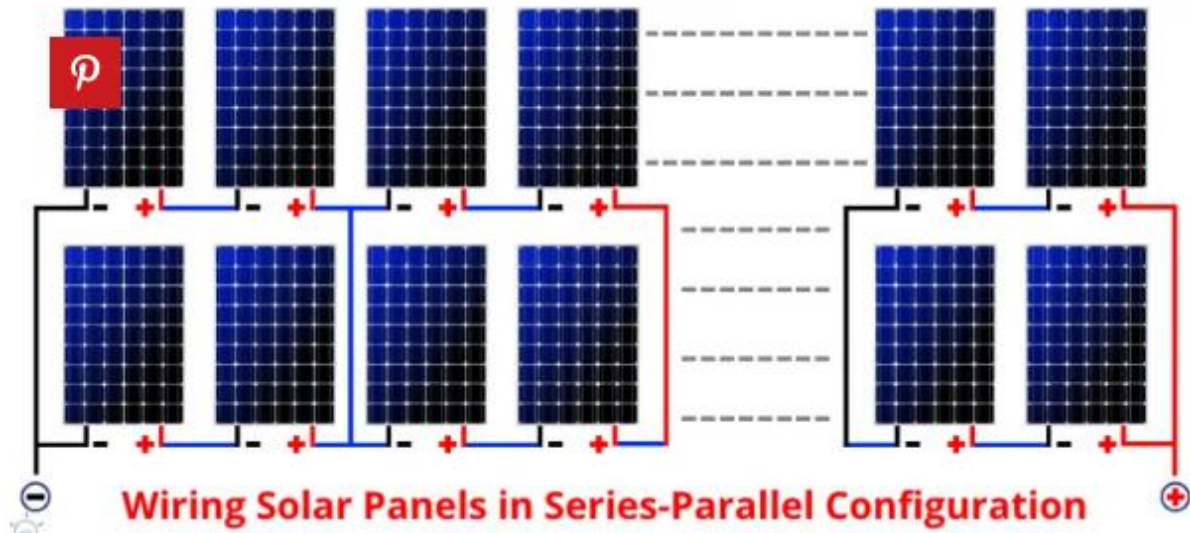
What is the difference between PV module and PV array?

Originally, a solar panel consists of three different mechanisms which are the cells, module, and array. The solar cell is the primary element of a panel that helps the photovoltaic to process the absorption of energy from the sun. The solar cells are the ones needed to acquire a good amount of energy.

PV module or the solar panel itself is where the solar cells are being accommodated. This is where the solar cells are placed to have the suitable amount of energy kilowatts or the electricity voltage.

On the other hand, is the PV array in which the solar PV modules or the panels are being linked or interconnected with each other to gain the desired amount of energy voltage and to transmit it to the panel.

Overall, each of these elements has its function and it can be concluded as well that the three elements are dependent on each other when it comes to operating. Each of them is useful and has a vital role to play in absorbing and generating energy.

Effect of Shading on PV Panel

Solar photovoltaic (PV) systems generate electricity via the photovoltaic effect — whenever sunlight knocks electrons loose in the silicon materials that make up solar PV cells. As such, whenever a solar cell or panel does ***not*** receive sunlight — due to a shading or nearby obstructions — the entire installation generates less overall solar power. This phenomenon is known as PV system shade loss.

Shading can come from a variety of different sources, including:

- Nearby objects, such as buildings, trees, antennae, or poles

- "Self-shading" from other PV panel rows

- Horizon shading from the terrain surrounding the installation site
- Other factors such as panel orientation, soiling, or differential aging

To conceptualize why shading results in such severe losses, it is helpful to use the analogy of water flowing in pipes. The flow rate of water through the pipe is constant, much like the current through a cell string is constant for a given irradiance level.

Shading a solar cell is similar to introducing a clog in a water pipe. The clog restricts the flow of water through the entire pipe. Similarly, when a solar cell is shaded, the electrical current through the entire string is reduced.

This is significant because every PV cell in the cell string has to operate at the current set by the shaded cell. This limitation prevents the ***unshaded*** cells from operating at peak performance. In essence, every solar cell is like a link in a chain. The shaded cell is the "weakest link," reducing all the remaining cells' power availability. This explains why even ***partial*** shading can have such a dramatic effect on the total power output of a solar PV system.

Similar principles apply to PV modules connected together.

The current flowing through an entire string of modules can be heavily reduced if even just a single module is shaded. As a result, the entire PV system underperforms — failing to deliver the energy, savings, and carbon offsets the customer is expecting.

How to reduce shading losses

As an installer, there are a number of different solar design strategies you can use to reduce shading losses. These include using different stringing arrangements, bypass diodes, and module-level power electronics (MLPEs).

1. Stringing Arrangements

Modules connected in series form strings, and strings can be connected in parallel to an inverter. The electrical current through all the modules of a string must be the same. By contrast, the voltage of parallel strings must be the same.

As we saw in the last section, a shaded module in a string can bring down the power output of the string significantly. However, a shaded module in one string does not reduce the power output of a *parallel* string. Therefore, by grouping shaded modules into separate strings, it's possible to maximize the total overall power output of the solar array.

For example, in a commercial system with parapet walls, it can be beneficial to group modules that receive shade from the parapets into strings — and keep modules that do *not* receive shade in separate, parallel strings. This way, the un shaded strings can maintain a higher current and power output.

2. Bypass Diodes

Bypass diodes are devices within a module that allow the electrical current to "skip over" shaded regions of the solar module. By using bypass diodes, the higher current of the unshaded cell strings can flow *around* the shaded cell string. However, this comes at the expense of losing the solar output of the PV cells that are skipped over.

In theory, you could install a dedicated bypass diode for each solar cell. But for cost reasons, a typical solar module will have only three bypass diodes, effectively grouping the cells into three series cell strings (see below). For instance, a 60-cell module will typically have one bypass diode for every 20 cells.
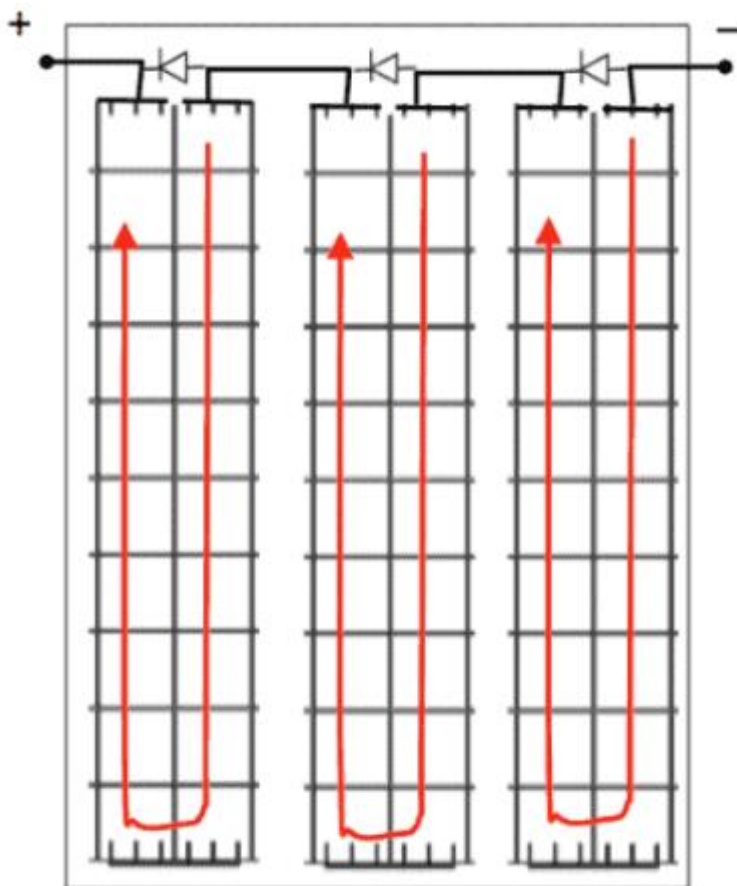
PV module containing three cell strings in series, each with a parallel bypass diode.

Bypass Diode and Blocking Diode Working used for Solar Panel Protection in Shaded Condition

In different types of solar panels designs, both the bypass and blocking diodes are included by the manufactures for protection, reliable and smooth operation. We will discuss both **blocking and bypass diodes in solar panels** with working and circuit diagrams in details below.

Bypass Diode in a solar panel is used to protect partially shaded photovoltaic cells array inside solar panel from the normally operated photovoltaic string in the peak sunshine in the same PV panel. In multi panel PV strings, the faulty panel or string has been bypassed by the diode which provide alternative path to the flowing current from solar panels to the load.

Blocking Diode in a solar panel is used to prevent the batteries from draining or discharging back through the PV cells inside the solar panel as they acts as load in night or in case of fully covered sky by clouds etc. In short, as diode only passes current in one direction, so the current from solar panels flows (forward biased) to the battery and blocks from the battery to the solar panel (reverse biased).

Effect of Temperature on Solar cells

Solar cells are sensitive to temperature changes. An increase in temperature reduces the band gap of the semiconductor, thus affecting most of the parameters of semiconductor material. The decrease in the band gap of a semiconductor with increase in temperature is an increase in the **energy of electrons in the material.** Lower energy is thus required for breaking the bond. In a bond model of a band gap of a semiconductor, reducing the bond energy reduces also the band gap. Thus increasing the temperature also reduces the band gap. In the solar cell, the most affected parameter by temperature increase is the open circuit voltage. The open circuit voltage decreases with **temperature decrease** because of the temperature dependence of I_0. The I_0 equation from one side of

$$I_0 = qA \frac{D n_i^2}{L N_D}$$

where: q: electronic charge A: area D: diffusivity of minority carrier provided for silicon as a function of doping L: minority carrier diffusion length N_D: doping n_i: intrinsic carrier concentration In the equation above, several parameters have temperature dependence, but the utmost important effect is due to n_i, **intrinsic carrier concentration**. n_i depends on the band gap energy (where lower band gaps give a higher intrinsic carrier concentration), and on

the energy that the carriers have (where higher temperatures give higher intrinsic carrier concentrations). The intrinsic carrier concentration equation is:

$$n_i^2 = 4 \left(\frac{2\pi kT}{h^2}\right)^3 (m_e^* m_h^*)^{3/2} \exp\left(-\frac{E_{G0}}{kT}\right) = BT^3 \exp\left(-\frac{E_{G0}}{kT}\right)$$

where: T: temperature; h & k: constants m_e & m_h : effective electrons and holes masses respectively; E_{G0}: band gap linearly extrapolated to absolute zero B: constant independent of temperature. Substituting the equations into the equation for I_0, with assumption that the temperature dependencies of the other

$$I_0 = qA \frac{D}{LN_D} BT^3 \exp\left(-\frac{E_{G0}}{kT}\right) \approx B'T^\gamma \exp\left(-\frac{E_{G0}}{kT}\right)$$

Where: B': temperature independent constant γ: A constant used instead of the number 3 to incorporate possible dependencies of temperature of other material parameters The effect of I_0 on open circuit voltage can be determined by the substitution of the equation of I_0 into the V_{oc} equation as below:

$$V_{OC} = \frac{kT}{q} \ln\left(\frac{I_{SC}}{I_0}\right) = \frac{kT}{q} [\ln I_{SC} - \ln I_0] = \frac{kT}{q} \ln I_{SC} - \frac{kT}{q} \ln\left[B'T^\gamma \exp\left(-\frac{qV_{G0}}{kT}\right)\right]$$
$$= \frac{kT}{q}\left(\ln I_{SC} - \ln B' - \gamma \ln T + \frac{qV_{G0}}{kT}\right)$$

$$\frac{dV_{OC}}{dT} = \frac{V_{OC} - V_{G0}}{T} - \gamma\frac{k}{q}$$

As $E_{G0} = qV_{G0}$. Assuming dV_{oc}/dT is independ on dI_{sc}/dT, dV_{oc}/dT can be determined as. The equation above displays that temperature sensitivity for a solar cell is dependent on open circuit voltage of the solar cell, where the higher voltage solar cells are less affected by temperature. For silicon, E_{G0} value is 1.2, and using γ equal to 3 gives a reduction in the open circuit voltage of around 2.2 mV/°C

$$\frac{dV_{OC}}{dT} = -\frac{V_{G0} - V_{OC} + \gamma\frac{kT}{q}}{T} \approx -2.2 mV \; per \; °C \; for \; Si$$

The short circuit current, I_{sc}, slightly increases with temperature, as band gap energy, E_G, decreases and extra photons have enough energy for creating electron hole pairs. Yet, this effect is small.

Types of Solar Cell

Solar Cell Type	Efficiency Rate	Advantages	Disadvantages
Monocrystalline Solar Panels (Mono-SI)	~20%	High efficiency rate; optimised for commercial use; high life-time value	Expensive
Polycrystalline Solar Panels (p-Si)	~15%	Lower price	Sensitive to high temperatures; lower lifespan & slightly less space efficiency
Thin-Film: Amorphous Silicon Solar Panels (A-SI)	~7-10%	Relatively low costs; easy to produce & flexible	shorter warranties & lifespan
Concentrated PV Cell (CVP)	~41%	Very high performance & efficiency rate	Solar tracker & cooling system needed (to reach high efficiency rate)

How to Categorise the Different Types of Solar Panels

Different types of solar panels serve different needs and purposes.

Given that sunlight can be used differently whether on Earth or in space points to the fact that location, itself, is a significant factor when it comes to choosing one of the types of solar panels over another.

Distinguishing between different types of solar panels often means differentiating between single-junctions and multi-junctions solar panels—or first, second, or third generations. Single-junction and multi-junctions differ in the number of layers on the solar panel that will observe the sunlight, whereas the classification by generation focuses on the materials and efficiency of the different types of solar panels.

1st Generation Solar Panels

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

These are the traditional types of solar panels made of monocrystalline silicon or polysilicon and are most commonly used in conventional surroundings.

Monocrystalline Solar Panels (Mono-SI)
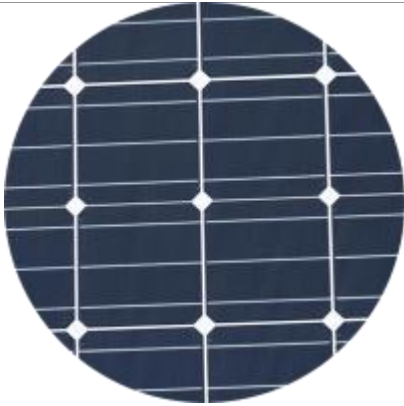
This type of solar panels (made of monocrystalline silicon) is **the purest one**. You can easily recognise them from the **uniform dark look** and the **rounded edges**. The silicon's high purity causes this type of solar panel has one of the highest **efficiency rates**, with the newest ones **reaching above 20%**

Monocrystalline panels have a high power output, occupy less space, and last the longest. Of course, that also means they are the most expensive of the bunch. Another advantage to consider is that they tend to be slightly less affected by high temperatures compared to polycrystalline panels.

Polycrystalline Solar Panels (Poly-SI)

You can quickly distinguish these panels because this type of solar panels has squares, its angles are not cut, and it has **a blue, speckled look**. They are **made by melting raw silicon**, which is a **faster and cheaper** process than that used for monocrystalline panels.

This leads to a lower final price but also lower **efficiency** **(around 15%)**, lower space efficiency, and a **shorter lifespan** since they are affected by hot temperatures to a greater degree. However, the differences between mono- and polycrystalline types of solar panels are not so significant and the choice will strongly depend on your specific situation. The first option offers a slightly higher space efficiency at a slightly higher price but power outputs are basically the same.

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501
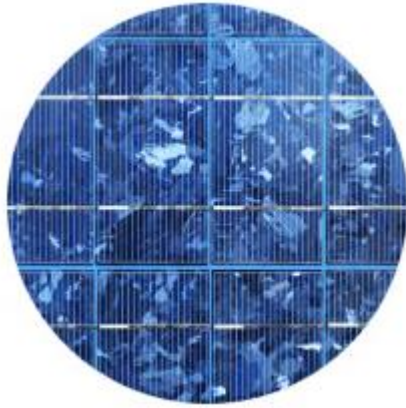
2nd Generation Solar Panels

These cells are different types of **thin film solar cells** and are mainly used for photovoltaic power stations, integrated in buildings or smaller solar systems.

Thin-Film Solar Cells (TFSC)

If you are looking for a **less expensive** option, you might want to look into thin-film. Thin-film solar panels are manufactured by placing one or more films of photovoltaic material (such as silicon, cadmium or copper) onto a substrate. These types of solar panels are the **easiest to produce** and economies of scale make them cheaper than the alternatives due to less material being needed for its production.

They are also flexible—which opens a lot of opportunities for alternative applications—and is less affected by high temperatures. The main issue is that they take up a lot of space, generally making them unsuitable for residential installations. Moreover, they carry the shortest warranties because their lifespan is shorter than the mono- and polycrystalline types of solar panels. However, they can be a good option to choose among the different types of solar panels where a lot of space is available.

Amorphous Silicon Solar Cell (A-Si)

Have you ever used a solar powered pocket calculator? Yes? Then you have definitely seen these types of solar panels before. The amorphous silicon solar cell is among the different

types of solar panels, the one that is used mainly in such pocket calculators. This type of solar panel uses a triple layered technology, which is the best of the thin film variety.

Just to give a brief impression of what "thin" means, in this case, we're talking about a thickness of 1 micrometre (one millionth of a metre). With only 7% efficiency rate, these cells are less effective than crystalline silicon ones—that have an efficiency rate of circa 18%—but the advantage is the fact that the A-Si-Cells are relatively low in cost.

Solar charge controller

The first solar charge controller schematic below (Figure 1) illustrates how a solar charge controller is connected to power a direct current (DC) load, and the second one (Figure 2) pertains to an alternating current (AC) load.
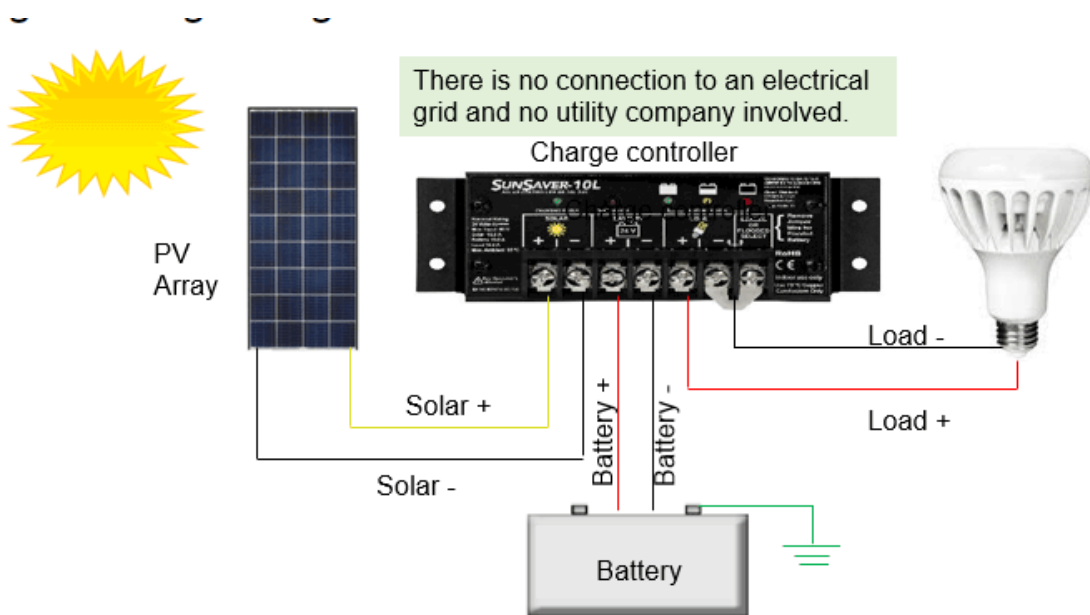
Off-grid Diagram with DC Load

When installing a solar charge controller, it is recommended that you connect and disconnect in the following order:

1. Battery to the controller first

2. PV array to the controller

3. Electrical load to the controller

When disconnecting, you reverse that order. The battery provides power to the controller so always make sure that solar and loads are disconnected before connecting or disconnecting the battery from the controller. Connections between the battery, load, PV array, and the controller should have disconnect switches to enhance safety and facilitate ease of installation and breakdown.

In the wire diagram schematic above with DC load, sunlight contacts the solar modules, which convert solar into DC electrical power that it delivers to a charge controller. The charge controller regulates the amperage and voltage that is delivered to the loads and any excess power is delivered to the battery system so the batteries maintain their state of charge without getting overcharged. During the evening when there is no sunlight, battery power is used to run the load.

You'll notice that the battery is grounded at the negative battery terminal. This is because all our PWM and MPPT controllers have a common negative ground. Therefore, it is possible to establish a common negative ground for the entire system: the solar array, controller, battery, and load. This meets NEC code requirements for grounding. If you need an equipment ground for any metal parts on a controller enclosure, some of our controllers include an equipment ground terminal lug. Otherwise, for our controllers that don't have this terminal lug, you can connect an equipment ground directly to the controller enclosure.

The next diagram (Figure 2) depicts the components and connections to power an AC load. This diagram with an AC load looks similar to the previous example with a DC load, except that in this example, we have added an inverter to the system. The purpose of the inverter is to convert the DC power from the battery to AC power that can be used to run an AC load like the TV you see in the schematic.

Off-grid Diagram with AC Load
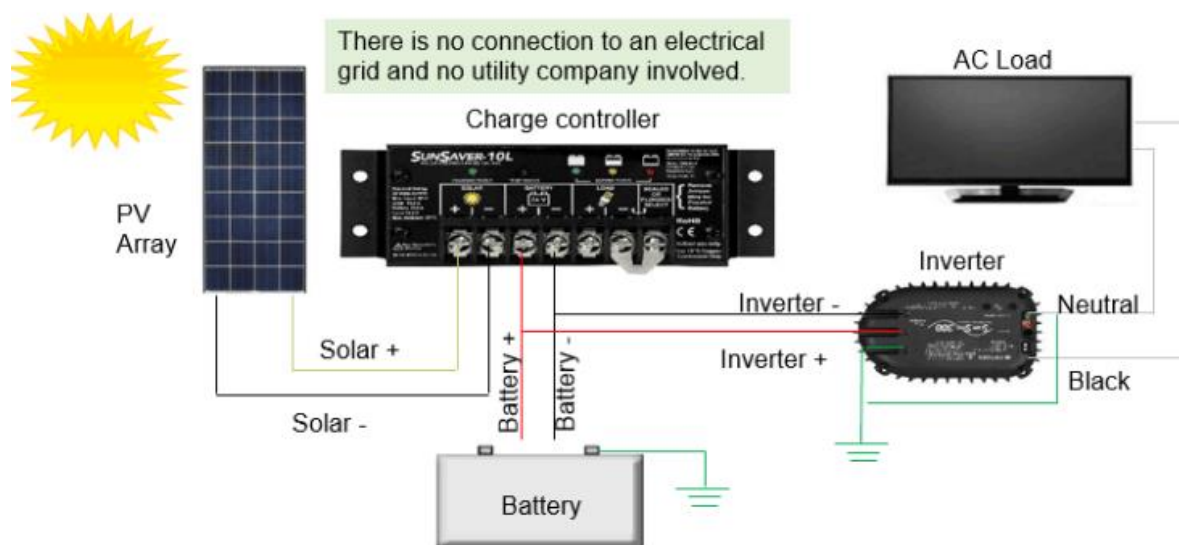
It's important to note that the inverter is connected and powered from the battery, not the controller's load terminals like we did in the DC load example. That's because the inverter can have a high energy surge upon startup, and this high current surge might be higher than the rated capacity of the charge controller, whereas the batteries will be able to meet the high energy surge requirement.

Introduction of Maximum Power Point Algorithm

Maximum power point tracking (MPPT) is an algorithm implemented in photovoltaic (PV) inverters to continuously adjust the impedance seen by the solar array to keep the PV system operating at, or close to, the peak power point of the PV panel under varying conditions, like changing solar irradiance, temperature.

Maximum power point tracking (**MPPT**) or sometimes just **power point tracking** (**PPT**),is a technique used with variable power sources to maximize energy extraction as conditions vary. The technique is most commonly used with photovoltaic (PV) solar systems, but can also be used with wind turbines, optical power transmission and thermophotovoltaics.

PV solar systems have varying relationships to inverter systems, external grids, battery banks, and other electrical loads. The central problem addressed by MPPT is that the efficiency of power transfer from the solar cell depends on the amount of available sunlight, shading, solar panel temperature and the load's electrical characteristics. As these conditions vary, the load characteristic (impedance) that gives the highest power transfer changes. The system is optimized when the load characteristic changes to keep power transfer at highest efficiency. This optimal load characteristic is called the *maximum power point* (MPP). MPPT is the process of adjusting the load characteristic as the conditions change. Circuits can be designed to present optimal loads to the photovoltaic cells and then convert the voltage, current, or frequency to suit other devices or systems.

Solar cells' non-linear relationship between temperature and total resistance can be analyzed based on the Current-voltage (I-V) curve and the power-voltage (P-V) curves. MPPT samples cell output and applies the proper resistance (load) to obtain maximum power. MPPT devices are typically integrated into an electric power converter system that provides voltage or current conversion, filtering, and regulation for driving various loads, including power grids, batteries, or motors. Solar inverters convert DC power to AC power and may incorporate MPPT.

The power at the MPP (P_{mpp}) is the product of the MPP voltage (V_{mpp}) and MPP current (I_{mpp}).

In general, the P-V curve of a partially shaded solar array can have multiple peaks, and some algorithms can get stuck in a local maximum rather than the global maximum of the curve

When directly connecting a load to cell, the operating point of the panel is rarely at peak power. The impedance seen by the panel determines its operating point. Setting the impedance correctly achieves peak power. Since panels are DC devices, DC-DC converters transform the impedance of one circuit (source) to the other circuit (load). Changing the duty ratio of the DC-DC converter changes the impedance (duty ratio) seen by the cell. The I-V curve of the panel can be considerably affected by atmospheric conditions such as irradiance and temperature.

MPPT algorithms frequently sample panel voltages and currents, then adjust the duty ratio accordingly. Microcontrollers implement the algorithms. Modern implementations often utilize more sophisticated computers for analytics and load forecasting.

Controllers can follow several strategies to optimize power output. MPPTs may switch among multiple algorithms as conditions dictate

Perturb and observe

In this method the controller adjusts the voltage from the array by a small amount and measures power; if the power increases, further adjustments in that direction are tried until power no longer increases. This is called *perturb and observe* (P&O) and is most common, although this method can cause power output to oscillate. It is also referred to as a *hill climbing* method, because it depends on the rise of the curve of power against voltage below the maximum power point, and the fall above that point. Perturb and observe is the most commonly used method due to its ease of implementation. Perturb and observe method may result in top-level efficiency, provided that a proper predictive and adaptive hill climbing strategy is adopted.

Incremental conductance

In this method, the controller measures incremental current and voltage changes to predict the effect of a voltage change. This method requires more computation in the controller, but can track changing conditions more rapidly than P&O. Power output does not oscillate.   It utilizes the incremental conductance (dI/dV) of the photovoltaic array to compute the sign of the change in power with respect to voltage (dP/dV).   The incremental conductance method computes MPP by comparison of the incremental conductance (I_Δ/V_Δ) to the array conductance (I/V). When these two are the same $(I/V = I_\Delta/V_\Delta)$, the output voltage is the MPP voltage. The controller maintains this voltage until the irradiation changes and the process is repeated.

The incremental conductance method is based on the observation that at MPP, $dP/dV = 0$, and that $P = IV$. The current from the array can be expressed as a function of the voltage:

$$P = I(V)V.$$

Therefore, $dP/dV = V dI/dV + I(V)$. Setting this equal to zero yields: $dI/dV = -I(V)/V$. Therefore, MPP is achieved when the incremental conductance is equal to the negative of the instantaneous conductance. The power-voltage curve characteristic shows that: when the voltage is smaller than MPP, $dP/dV > 0$, so $dI/dV > -I/V$; when the voltage is bigger than MPP, $dP/dV < 0$ or $dI/dV < -I/V$. Thus, a tracker can know where it is on the power-voltage curve by calculating the relation of the change of current/voltage and the current voltage themselves.

Constant voltage

Constant voltage methods include one in which the output voltage is regulated to a constant value under all conditions and one in which the output voltage is regulated based on a constant ratio to the measured open circuit voltage (Voc). The latter technique may also be labelled the "open voltage" method. If the output voltage is held constant, there is no attempt to track MPP, so it is not strictly a MPPT technique, though it does function in cases when MPP tracking tends to fail, and thus it is sometimes used supplementary. In the open voltage method, power delivery is momentarily interrupted and the open-circuit voltage with zero current is measured. The controller then resumes operation with the voltage controlled at a fixed ratio, such as 0.76, of the open-circuit voltage Voc.This is usually a value that has been predetermined to be the MPP, either empirically or based on modelling, for expected operating conditions. The array's operating point is thus kept near MPP by regulating the array voltage and matching it to the fixed reference voltage Vref = KVoc. The value of Vref may be chosen to give optimal performance relative to other factors as well as the MPP, but the central idea is that Vref is determined as a ratio to Voc. One of the inherent

approximations in the method is that the ratio of MPP voltage to Voc is only approximately constant, so it leaves room for further possible optimization.

Subject Teacher

HOD EE

PRINCIPAL

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D College Of Engineering and Management

GOYAL | A VENTURE OF **GOYAL** GROUP

Department of Electronics &
Telecommunication
Engineering
Welcomes to All

IoT

Unit I

About the Institute

Vision: To be a centre of Excellence providing professional education satisfying societal and global needs.

Mission: Transforming students into lifelong learners through quality teaching, training and exposure to concurrent technologies. Fostering conducive atmosphere for research and development through well equipped laboratories and qualified personnel in collaboration with global organizations.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

About the Department

Vision: To be a department providing high quality and globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication.

Mission:

➢ To provide quality teaching learning process through well-developed educational environment and dedicated faculty members.

➢ To produce competent technocrats of high standards satisfying

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Syllabus of Module 1

Module-1: Introduction to IoT:

Sensing, Actuation, Networking basics, Communication Protocols, Sensor Networks, Machine-toMachine Communications, IoT Definition, Characteristics. IoT Functional Blocks, Physical design of IoT, Logical design of IoT, Communication models & APIs.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

What is the Internet of Things: History of IoT

➢ Early in 1926, Nikola Tesla envisioned a "connected world." He told Colliers Magazine in an interview (Kennedy, 1926):

➢ "When wireless is perfectly applied, the whole Earth will be converted into a huge brain, which in fact it is, all things being particles of a real and rhythmic whole and the instruments through which we shall be able to do this will be amazingly simple compared with our present telephone. A man will be able to carry one in his vest pocket."

➢ Kevin Ashton was the first to use the term Internet of Things (IoT) in 1999 in the context of supply chain management with radio frequency identification (RFID)-tagged or barcoded items (things) offering greater efficiency and accountability to businesses.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

IoT Picture

IoT Picture

The Internet of Things

IoT Picture

Sensor

- A **sensor** is a device, module, machine, or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, frequently a computer processor. A sensor is always used with other electronics.
- In simple terms, a sensor is a device that detects changes and events in a physical stimulus and provides a corresponding output signal that can be measured and/or recorded. Here, the output signal can be any measurable signal and is generally an electrical quantity.

Sensor

- The best example of a sensor is mercury thermometer. Here the quantity that is being measured is heat or temperature. The measured temperature is converted to a readable value on the calibrated glass tube, based on the expansion and contraction of liquid mercury.
- Other examples are : Light sensor, Image sensor, temperature sensor, pressure sensor, Humidity sensor etc.
- **A sensor converts a physical event into an electrical signal.**

Basic requirements of sensor

- **Range:** It indicates the limits of the input in which it can vary. In case of temperature measurement, a thermocouple can have a range of 25 – 250 0C.
- **Accuracy:** It is the degree of exactness between actual measurement and true value.
- **Sensitivity:** Sensitivity is a relationship between input physical signal and output electrical signal. It is the ratio of change in output of the sensor to unit change in input value that causes change in output.
- **Stability:** It is the ability of the sensor to produce the same output for constant input over a period of time.
- **Repeatability:** It is the ability of the sensor to produce same output for different applications with same input value.

Basic requirements of sensor

- **Response Time:** It is the speed of change in output on a stepwise change in input.
- **Linearity:** It is specified in terms of percentage of nonlinearity. Nonlinearity is an indication of deviation of curve of actual measurement from the curve of ideal measurement.
- **Ruggedness:** It is a measure of the durability when the sensor is used under extreme operating conditions.

Actuators

- Actuators are devices that work opposite to sensors.
- actuator converts electrical signal into a physical event.

Sensor — Temperature sensor detects heat.
Sends this detect signal to the control center.
Control Center — Control center sends command to sprinkler.
Actuator — Sprinkler turns on and puts out flame.

Sensor to **Actuator** Flow

IoT actuator types

- **Linear actuators** – these are used to enable motion of objects or elements in a straight line.
- **Motors** – they enable precise rotational movements of device components or whole objects.
- **Relays** – this category includes electromagnet-based actuators to operate power switches in lamps, heaters or even smart vehicles.
- **Solenoids** – most widely used in home appliances as part of locking or triggering mechanisms, they also act as controllers in IoT-based gas and water leak monitoring systems.

IoT actuator types

1) **Linear Actuators:** Linear actuators are a type of actuator that convert rotational motion in motors into linear or straight push/pull movements.
- Linear actuators are ideal for all types of applications where tilting, lifting, pulling or pushing with pounds of force are required.
- Electric linear actuators are often the preferred solution when you need simple, safe and clean movement with accurate precision and smooth motion control.
- The different Linear actuators are shown on next slide.

IoT actuator types

IoT actuator types

2) **Motors:** A servo motor is an example of an actuator. They are linear or rotatory actuators, can move to a given specified angular or linear position. We can use servo motors for IoT applications and make the motor rotate to 90 degrees, 180 degrees, etc., as per our need.

Sensors(measure the temperature) → Continuosly measures the temperature → Controller (decision maker) → If temperature gets above certain temperature then turn on the fan / Else no action → Actuator (cooling fan)

GeeksforGeeks

IoT actuator types

IoT actuator types

3) Relays: A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays.

- The advantage of relays is that it takes a relatively small amount of power to operate the relay coil.
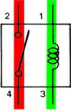- But the relay itself can be used to control motors, heaters, lamps or AC circuits which themselves can draw a lot more electrical power.

IoT actuator types

❖ **Relay Basics:**
- Consider the figure shown below. There are two colours shown. The green colour represents the control circuit and the red colour represents the load circuit.
- A small control coil is connected onto the control circuit. A switch is connected to the load.
- This switch is controlled by the coil in the control circuit. Now let us take the different steps that occur in a relay.

IoT actuator types

- As shown in the circuit, the current flowing through the coils represented by pins 1 and 3 causes a magnetic field to be aroused.
- This magnetic field causes the closing of the pins 2 and 4. Thus the switch plays an important role in the relay working. As it is a part of the load circuit, it is used to control an electrical circuit that is connected to it.
- Thus, when the electrical relay in energized the current flow will be through the pins 2 and 4.
- As soon as the current flow stops through pins 1 and 3, the relay switch opens and thus the open circuit prevents the current flow through pins 2 and 4.
- Thus the relay becomes de-energized and thus in off position.

IoT actuator types

4) Solenoids: A solenoid is simply a specially designed electromagnet.
- Solenoids are inexpensive, and their use is primarily limited to on-off applications such as latching, locking, and triggering.
- They are frequently used in home appliances (e.g. washing machine valves), office equipment (e.g. copy machines), automobiles (e.g. door latches and the starter solenoid), pinball machines (e.g., plungers and bumpers), and factory automation.

Networking in IoT

Q. What is IoT Network?

Ans: An IoT network refers to a collection of interconnected devices that communicate with other devices without the need for human involvement, such as autonomous cars, smart appliances, and wearable tech.

❖ **Types of IoT Network:**
- There are basically 4 different types of IoT network.
1). Cellular
- Cellular networks use the same mobile networks as smartphones to allow IoT devices to communicate.
- Because these networks were originally designed for power-hungry devices like smartphones, they weren't always considered the best fit for IoT devices.

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

Networking in IoT

- Cell service is available in most locations in the U.S., and this type of network covers a very large area. However, cell connectivity often isn't available in the places that most need monitoring sensors—for example, inside utility closets, elevator shafts, basements, etc.
- And even though cellular connectivity is now less expensive and more power efficient than traditional telecom standards, cellular-connected IoT devices still require a great deal more power and energy than some other types of wireless networks.
- Two cellular IoT wireless protocols currently vying for dominance are **LTE-M** and **Narrowband IoT (NB-IoT).**
- LTE-M is a great option for IoT connectivity if you're willing to pay the price, and if your use case requires low power.
- NB-IoT is somewhat less costly than LTE-M and uses less battery power, but there's not enough coverage everywhere to reliably deploy an NB-IoT solution *yet*.

Networking in IoT

2) **Local and Personal Area Networks (LAN/PAN)**

- Networks that cover fairly short distances are called personal area networks (PAN) and local area networks (LAN).
- PAN and LAN networks are considered to be fairly cost-effective, but the transfer of data can sometimes be unreliable.
- Wireless personal and local area network technologies that are commonly incorporated into IoT connectivity solutions are **WiFi** and **Bluetooth.**
- WiFi can be used for applications that run in a local environment, or in a distributed setting if there are multiple access points integrated into a larger network.
- One downside to WiFi is that it works only if the signal is strong and you're close to the access point.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Networking in IoT

- Also, WiFi is generally more power-hungry than people think, but it is possible to operate it in a way that's a little more power-efficient (for example, your device only connects periodically to send data, then goes back to sleep).
- Bluetooth Low Energy (BLE) is a more energy-efficient wireless network protocol—if you're not receiving data constantly, a single battery running BLE could last up to five years.
- However, compared to WiFi it is slower to transmit and is more limited in the amount of data it is capable of sending.
- Both WiFi and Bluetooth are easy to connect in most cases, although WiFi does have some security challenges that may be difficult to overcome.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Networking in IoT

- 3) Low Power Wide Area Networks (LPWAN)
- IoT devices that run on LPWANs send small packets of information infrequently and over long distances.
- This type of wireless network was developed in response to the early challenges of cellular connectivity. Proponents of LPWAN position it as longer-range than WiFi and Bluetooth, but using less power than cellular.
- Sigfox built the first LPWAN network in France and is considered the driving force behind its growth.
- A well-known and commonly used IoT network protocol in this category is **LoRaWAN** (long range wireless area network), which runs on the LoRa (long range) communication network.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Networking in IoT

- Advantages of LoRaWAN for IoT devices are its low power requirement (for long battery life) and relatively low-cost chipsets.
- Plus, under the right conditions, a single base station or gateway running on a long-range network is capable of providing service to a very large area—a few kilometers in dense urban areas and up to 15–30 kilometers in rural areas.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Networking in IoT

4) Mesh Network:

- Mesh networks are best described by their connectivity configuration—how the components communicate with each other.
- In mesh networks, all the sensor nodes cooperate to distribute data amongst each other to reach the gateway.
- **Zigbee** is one example of an IoT wireless network technology. Mesh networks are very short range and may require extra sensors throughout a building or the use of repeaters to get the coverage your application needs.

VISION	MISSION
"To be a Department providing high quality & globally competent knowledge of concurrent technologies in the field of Electronics and Telecommunication."	1) To provide quality teaching learning process through well-developed educational environment and dedicated faculties. 2) To produce competent technocrats of high standards satisfying the needs of all stakeholders.

Networking in IoT

- Also, the nature of the way these networks communicate can result in high power consumption, especially if you need instant messaging, such as for a smart lighting application.
- However, mesh networks are also fairly robust, able to find the fastest and most reliable paths to send data, and easy to install, making them a popular choice for in-building use.

IoT Communication Protocols

❖ OSI Model:

Networking in IoT

1) Physical Layer: It is responsible for the actual physical connection between the devices.

- The physical layer contains information in the form of **bits.** It is responsible for transmitting individual bits from one node to the next.
- When receiving data, this layer will get the signal received and convert it into 0s and 1s and send them to the Data Link layer, which will put the frame back together.

2) Data Link Layer: The data link layer is responsible for the node to node delivery of the message. The main function of this layer is to make sure data transfer is error-free from one node to another, over the physical layer.

Networking in IoT

3) Network Layer:
- It works for the transmission of data from one host to the other located in different networks.

4) Transport Layer:
- Transport layer provides services to application layer and takes services from network layer.

5) Session Layer:
- This layer is responsible for establishment of connection, maintenance of sessions, authentication and also ensures security.

6) Presentation Layer:
- Presentation layer is also called the **Translation layer**.The data from the application layer is extracted here and manipulated as per the required format to transmit over the network.

Networking in IoT

7) Application Layer:
- At the very top of the OSI Reference Model stack of layers, we find Application layer which is implemented by the network applications.
- Ex: Application – Browsers, Skype Messenger etc.

IoT Protocols

➤ **Data Link Protocol**

1) IEEE 802.15.4: It is the most commonly used IoT standard for MAC. It defines a frame format, headers including source and destination addresses, and how nodes can communicate with each other.

- The frame formats used in traditional networks are not suitable for low power multi-hop networking in IoT due to their overhead.
- In 2008, IEEE802.15.4e was created to extend IEEE802.15.4 and support low power communication. It uses time synchronization and channel hopping to enable high reliability, low cost and meet IoT communications requirements.
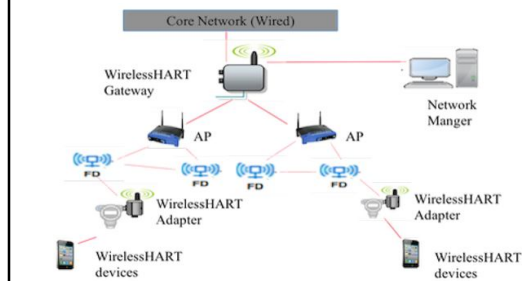
IoT Protocols

2) IEEE 802.11 AH: It is a light (low-energy) version of the original IEEE 802.11 wireless medium access standard.

- It has been designed with less overhead to meet IoT requirements. IEEE 802.11 standards (also known as Wi-Fi) are the most commonly used wireless standards.
- They have been widely used and adopted for all digital devices including laptops, mobiles, tablets, and digital TVs.
- However, the original WiFi standards are not suitable for IoT applications due to their frame overhead and power consumption.
- Hence, IEEE 802.11 working group initiated 802.11ah task group to develop a standard that supports low overhead, power friendly communication suitable for sensors and motes

IoT Protocols

3) WirelessHART: WirelessHART is a datalink protocol that operates on the top of IEEE 802.15.4 PHY and adopts Time Division Multiple Access (TDMA) in its MAC.

- It is a secure and reliable MAC protocol that uses advanced encryption to encrypt the messages and calculate the integrity in order to offer reliability.
- The architecture, as shown in Figure below, consists of a network manager, a security manager, a gateway to connect the wireless network to the wired networks, wireless devices as field devices, access points, routers and adapters.
- The standard offers end-to-end, per-hop or peer-to- peer security mechanisms.
- End to end security mechanisms enforce security from sources to destinations while per-hop mechanisms secure it to next hop only.

IoT Protocols

IoT Protocols

4) Z-Wave: Z-Wave is a low-power MAC protocol designed for home automation and has been used for IoT communication, especially for smart home and small commercial domains.

- It covers about 30- meter point-to-point communication and is suitable for small messages in IoT applications, like light control, energy control, wearable healthcare control and others.
- It uses CSMA/CA for collision detection and ACK messages for reliable transmission.
- It follows a master/slave architecture in which the master control the slaves, send them commands, and handling scheduling of the whole network

IoT Protocols

5) Bluetooth Low Energy: Bluetooth low energy or Bluetooth smart is a short range communication protocol with PHY and MAC layer widely used for in-vehicle networking.

- Its low energy can reach ten times less than the classic Bluetooth while its latency can reach 15 times.
- Its access control uses a contentionless MAC with low latency.
- It follows master/slave architecture and offers two types of frames: adverting and data frames.
- The Advertising frame is used for discovery and is sent by slaves on one or more of dedicated advertisement channels.
- Master nodes sense advertisement channels to find slaves and connect them. After connection, the master tells the slave it's waking cycle and scheduling sequence.
- Nodes are usually awake only when they are communicating and they go to sleep otherwise to save their power

IoT Protocols

6) Zigbee Smart Energy: It is designed for a large range of IoT applications including smart homes, healthcare systems.

- It supports a wide range of network topologies including star, peer-to-peer, or cluster-tree.
- A coordinator controls the network and is the central node in a star topology, the root in a tree or cluster topology and may be located anywhere in peer-to-peer.
- ZigBee standard defines two stack profiles: ZigBee and ZigBee Pro.
- These stack profiles support full mesh networking and work with different applications allowing implementations with low memory and processing power.
- ZigBee Pro offers more features including security using symmetric-key exchange, scalability using stochastic address assignment, and better performance using efficient many-to-one routing mechanisms.

Sensor Network

- Sensor network is an infrastructure-less wireless network that is deployed in a large number of wireless sensors in an ad-hoc manner that is used to monitor the system, physical or environmental conditions.
- Sensor nodes are used in WSN with the onboard processor that manages and monitors the environment in a particular area.
- They are connected to the Base Station which acts as a processing unit in the WSN System.
- Base Station in a WSN System is connected through the Internet to share data.

Sensor Network

➤ **Applications of sensor network:**
- Internet of Things (IOT)
- Surveillance and Monitoring for security, threat detection
- Environmental temperature, humidity, and air pressure
- Noise Level of the surrounding
- Medical applications like patient monitoring
- Agriculture
- Landslide Detection

➤ **Challenges of WSN:**
- Quality of Service
- Security Issue
- Energy Efficiency
- Network Throughput
- Performance
- Ability to cope with node failure

Sensor Network

Components of Sensor Network:

- **Sensors:**
  Sensors in WSN are used to capture the environmental variables and which is used for data acquisition. Sensor signals are converted into electrical signals.
- **Radio Nodes:**
  It is used to receive the data produced by the Sensors and sends it to the WLAN access point. It consists of a microcontroller, transceiver, external memory, and power source.
- **WLAN Access Point:**
  It receives the data which is sent by the Radio nodes wirelessly, generally through the internet.
- **Evaluation Software:**
  The data received by the WLAN Access Point is processed by a software called as Evaluation Software for presenting the report to the users for further processing of the data which can be used for processing, analysis, storage, and mining of the data.

Machine to Machine (M2M) communication

- In this the interaction or communication takes place between machines by automating data/programs.
- In this machine level instructions are required for communication. Here communication takes place without human interaction.
- The machines may be either connected through wires or by wireless connection.
- An M2M connection is a point-to-point connection between two network devices that helps in transmitting information using public networking technologies like Ethernet and cellular networks.
- IoT uses the basic concepts of M2M and expands by creating large "cloud" networks of devices that communicate with one another through cloud networking platforms.

Machine to Machine (M2M) communication

➤ Advantages: –
- This M2M can operate over cellular networks and is simple to manage.
- It can be used both indoors and outdoors and aids in the communication of smart objects without the need for human interaction.
- The M2M contact facility is used to address security and privacy problems in IoT networks. Large-scale data collection, processing, and security are all feasible.

➤ **Disadvantages –**
- However, in M2M, use of cloud computing restricts versatility and creativity.
- Data security and ownership are major concerns here.

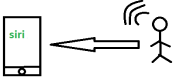## Machine to Machine (M2M) communication

➤ Examples:
- Smart Washing machine sends alerts to the owners' smart devices after completion of washing or drying of clothes.
- Smart meters tracks amount of energy used in household or in companies and automatically alert the owner.

Other types of IoT Communication:
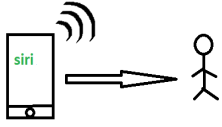
➢ **Human to Machine (H2M) :**

- In this human gives input to IOT device i.e as speech/text/image etc.
- IOT device (Machine) like like sensors and actuators then understands input, analyses it and responds back to human by means of text or Visual Display.
- This is very useful as these machines assist humans in every everyday tasks. It is a combo of software and hardware that includes human interaction with a machine to perform a task.
- This H2M has a user-friendly interface that can be quickly accessed by following the instructions.
- It responds more quickly to any fault or failure. Its features and functions can be customized.

siri

Other types of IoT Communication:

❖ Examples:

- Facial recognition.
- Bio-metric Attendance system.
- Speech or voice recognition.

➢ **Machine to Human (M2H) :**

- In this machine interacts with Humans. Machine triggers information(text messages/images/voice/signals) respective / irrespective of any human presence.
- This type of communication is most commonly used where machines guide humans in their daily life.
- It is way of interaction in which humans co-work with smart systems and other machines by using tools or devices to finish a task.

Other types of IoT Communication:

siri

❖Examples:
•Fire Alarms
•Traffic Light
•Fitness bands
•Health monitoring devices

Other types of IoT Communication:

➢**Human to Human (H2H) :**

- This is generally how humans communicate with each other to exchange information by speech, writing, drawing, facial expressions, body language etc.
- Without H2H, M2M applications cannot produce the expected benefits unless humans can immediately fix issues, solve challenges, and manage scenarios.

Prof. Avinash K. Ikhar

Course Coordinator /
Academic Incharge

Dr. Pravin Kshirsagar

HOD (ETC)

53

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

JAIDEV EDUCATION SOCIETY'S
J D COLLEGE OF ENGINEERING AND MANAGEMENT
KATOL ROAD, NAGPUR
Website: www.jdcoem.ac.in   E-mail: info@jdcoem.ac.in
(An Autonomous Institute, with NAAC "A" Grade)
Affiliated to DBATU, RTMNU and MSBTE Mumbai

VISION	MISSION
To be a center of excellence imparting professional education satisfying societal and global needs.	1. Transforming students into lifelong learners through, quality teaching, training and exposure to concurrent technologies. 2. Fostering conducive atmosphere for research and development through well-equipped laboratories and qualified personnel in collaboration with global organizations.

Academic Year 2022-23

MBA Semester- III

Sub: COMPENSATION AND BENEFITS MANAGEMENT- HRM3

Subject Code: (3T3)

Module 4 : STATUTORY PROVISIONS RELATED TO FRINGE BENEFITS

1. EARNED LEAVE:

Earned leave is mandatory for employees working in government sector but this leave is not mandatory and it is a voluntary benefit given to employees working in private and corporate sector. Irrespective of casual leaves, medical leaves and optional holidays, earned leaves can be availed by the employees for personal works. Unlike casual leaves some organizations may not grant single earned leave. If an employee wants to avail this sort of leave he/she needs to request for three or more in one stretch. In order to avail Leave under this benefit, he/she must inform controlling/superior officer in advance.

Why is it earned leave?

Unlike casual leaves, medical leaves and optional holidays, an employee can encash the unused earned leaves how many he/she has not availed or unutilized during the calendar year that is from 1st January to 31st December. But encashment of earned leaves is allowed only at the time of retirement of an employee or separation of employee other than suspension or dismissal from organization. Besides, few organizations allow to encash maximum of 300 earned leaves from total earned leaves accumulated at the time of retirement or separation of an employee, but not all unused earned leaves are allowed to encash.

2. SOCIAL SECURITY BENEFITS—

The word 'Social' is adjectival form of society, i.e. anything relating to the society. The word 'Security' is the measure of safety or protection from the danger or loss. Thus the phrase 'Social Security' refers to the measures of safety provided by the society to the needy for their protection

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

and releasing them 'free from want'. Social Security can be defined as measures providing protection to working class against contingencies like retirement, resignation, retrenchment, maternity benefits, paternity leave, old age, unemployment, death, disablement and other similar conditions.

The establishment of International Labour Organisation (ILO) ever since its inception in the year 1919 helped evolution of social Security legislation in the field of industrial relations. Various ILO Conventions dealing with Social Security of Women, Children, and employees in almost all types of industries are found enacted by various member-countries in their Social Security legislations.

Types   of   Social   Security
Social Security concept is divided into two branches, namely, Social Assistance and Social Insurance.

Difference between Social Assistance and Social Insurance

Briefly speaking, the difference between Social Assistance and Social Insurance as the two types of Social Security can be summarized as under:-

1. In case of Social Assistance, there is no contribution made by the employees and the financial burden is shared by the employer. Government or social organizations. Whereas in case of Social Insurance, the workman himself is also contributing his share in the financial responsibility.

2. In case of Social Assistance, it is gratuitously provided to the workman by the society, i.e. Government, employer or social organisation and therefore it cannot be claimed as a matter of right. Whereas in case of Social Insurance, it is a right of the workman to receive the social protection as he is also contributing towards the financial fund of such Schemes.

3. In case of Social Assistance the benefit cannot always be claimed through Court's intervention unless such scheme is provided as a statutory duty. Whereas in case of Social Insurance, it is a legal right of the workman also to claim it through the Court of Law.

Social Security for employees in India

Social Assistance is that measure of social action in which relief or protection is given by way of "assistance without taking any contribution from the workman" and such social assistance is to be found in the Governmental Scheme for various welfare measures for medical, financial or legal assistance gratuitously viz, Old-age pension, unemployment benefit, or various schemes for free medical treatment to the poor worker. Whereas in the case of 'Social Insurance', the scheme is prepared where in the concerned workman also pays his contribution to such schemes and get

benefit in case of any calamity, disease or accidents. The good examples of these two types of Social Security can be found in the 'Employee's Compensation Act, 1923' which is a non-contributory assistance given to the affected employees and the financial responsibility is shared by the employer. Whereas the Employees' State Insurance Act, 1948 (ESI) is the measure of Social Security wherein the employees also contribute their share. The Employees Provident Fund and Miscellaneous Provisions Act, 1952 is also a Scheme in which financial responsibility is shared between employers, employees and the Government.

With reference to India, the Constitution levies responsibility on the State to provide social security to citizens of the country. The State, here, discharges duty as an agent of the society in order to help those who are in adverse situations or otherwise needs protection owing to above mentioned contingencies. Article 41, 42 and 43 of the Constitution do talk about the same. Also, the Concurrent List of the Constitution of India mentions issues like-

- Social Security and insurance, employment and unemployment.

- Welfare of Labour including conditions of work, provident funds, employers' liability, workmen's compensation,invalidity and old age pension and maternity benefits.

Below mentioned are the important employment laws on the Social Security benefits within India meant for the employees working in various industries and it is compulsory for employer to provide Social Security benefits to his employees according to this acts. If any contrivance with laws mentioned below by the employer shall be made liable for punishment by the Legislature.

A. Employee benefits through State Insurance Act, 1948

Employees State insurance provides following benefits to the employees whoever got covered according to The Employees State insurance Act 1948.

Applicability

Under Section 2(12) the Act is applicable to non-seasonal factories employing 10 or more persons.

Note: However the threshold for Coverage of establishments is still 20 Employees in Maharashtra and Chandigarh. The existing wage limit for coverage under the Act is Rs.21,000/- per month (w.e.f. 01/01/2017).

Contribution

Currently, the contribution rate is 0.75% of wages of Employee and 3.25% payable by Employers for first 24 months (w.e.f. 1.7.2019) Employees in receipt of a daily average wage upto Rs.137/- are exempted from payment of contribution. Employers will however contribute their own share in respect of these employees.

Contribution Period	Corresponding Cash Benefit
1st April to 30th September	1st January to 30th June in the following Year
1st October to 31st March	1st July to 31st December in the following Year

Benefits

- **Medical benefit:** ESIC provides reasonable Medical Care for self and family from day one of entering into insurable employment.

- **Sickness benefit:** ESIC provides 70% of average daily wages in cash during medical leave, upto 91 days in two consecutive benefit periods. The employee needs to contribute for at least 78 days in the previous 6 months to be eligible for the benefit.

- **Disablement benefit:** ESIC provides continuous monthly payment till injury lasts for temporary disablement and for whole life for permanent disablement.

  Temporary disablement benefit (TDB) : From day one of entering insurable employment & irrespective of having paid any contribution in case of employment injury. Temporary Disablement Benefit at the rate of 90% of wage is payable so long as disability continues.

  Permanent disablement benefit (PDB): The benefit is paid at the rate of 90% of wage in the form of monthly payment depending upon the extent of loss of earning capacity as certified by a Medical Board

- **Dependants Benefit (DB)**: DB paid at the rate of 90% of wage in the form of monthly payment to the dependants of a deceased Insured person in cases where death occurs due to employment injury or occupational hazards.

- **Funeral Expenses:** An amount of Rs.15,000/- is payable to the dependents or to the person who performs last rites from day one of entering insurable employment.

- **Maternity benefit:** ESIC provides 100% of average daily wages in cash up to 26 weeks in confinement and 6 week in case of miscarriage, during maternity leave and 12 weeks for commissioning mother and adopting mother.

- **Unemployment allowance:** ESIC Provides monthly cash allowance for a duration of maximum 24 months at the rate of 50% of wages in case of involuntary loss of employment or permanent invalidity due to non-employment injury for employees contributing for 3 years or more.

b) Maternity Benefit

Applicability

The Maternity Benefit Act, 1961 regulates the employment of women in factories, mines, the circus industry, plantations and shops or establishments employing 10 or more persons except the employees who are covered under the Employees' State Insurance (ESI) 1948 for certain periods before and after child-birth and provides for maternity and other benefits.

Eligibility:

Women must have worked for a period of at least 80 days in the establishment as an employee.

- Under the Maternity Benefit Act, 1961, women employees are entitled to maternity benefit at the rate of average daily wage for the period of their actual absence up to 12 weeks due to the delivery. However, THE MATERNITY BENEFIT (AMENDMENT) ACT, 2017 NO .6 of 2017 passed, extends this period to 26 weeks. The leave can be availed from 8 weeks before expected date of delivery. However, a woman with two or more children will be entitled to 12 weeks of maternity leave, which can be availed from 6 weeks before delivery.

- **Additional Leave:** In cases of illness arising due to pregnancy, etc., they are entitled to additional leave with wages for a period of one month.

- **Miscarriage or Medical Termination of Pregnancy:** In case of miscarriage or medical termination of pregnancy, a woman shall, on production of such proof, be entitled to leave with salary for a period of 6 weeks immediately following the day of her miscarriage or her medical termination of pregnancy.

- **Leave for Tubectomy operation:** In case of Tubectomy operation, a woman shall, on production of such proof as may be prescribed, be entitled to leave with wage or salary for a period of 2 weeks immediately following the day of her Tubectomy operation.

- **Paid Leave to adoptive/ commissioning mothers:** Entitled to 12 weeks paid leave for adopting a child below the age of 3 months. Commissioning biological mothers who used her egg to create an embryo planted in any other woman.
  According to the 2016 Working Mother and AVTAR 100 Best Companies for Women in India, 70% of the companies offer paid leave to adoptive mothers. Only a few companies in India are treating adoption on a par with maternity leave. Among the jet-setting few is Accenture, which on Monday announced that it will provide 22 weeks leave irrespective of whether the child is biological, adopted or birthed through surrogacy. And among these, the ones that are most adoption friendly are IT majors, banks, insurers, FMCG players and automotive, chemical companies.

- **Medical Allowance:** Section 8 of the Maternity Benefit Act, 1961 provides that every woman entitled to maternity benefit shall also be entitled to receive from her employer medical bonus of Rs. 1000/-, if no pre-natal confinement and post-natal care is provided for by the employer free of charge.

- **Creche Facility:** mandatory for every establishment employing 50 or more employees. Women employees allowed visiting crèche 4 times during the day (including rest intervals).

- **Work from home:** after 26 weeks leave option can be exercised depending on the nature of work on mutually agreed terms with the employer.

c) **Paternity Leave:**

Though it is the mother who actually delivers the child, father plays an equally important role. A father is expected to be emotionally and physically available for both, mother and child, before

and after the delivery. In fact, legally accepting and providing two months of paternal leave has resulted in a reduced divorce rate in Sweden.

In India, the Central Government in 1999 by notification under Central Civil Services (Leave) Rule 551 (A) made provisions for paternity leave for a male Central Government employee (including an apprentice and probationer) with less than two surviving children for a period of 15 days to take care of his wife and new born child. He can avail this leave 15 days before or within 6 months from the date of delivery of child. If such leave is not availed within the period, it shall be treated as lapsed. For paternity leave he shall be paid leave salary equal to the pay last drawn immediately before proceeding on leave. Also, the same rule applies when a child is adopted.

CA Technologies has rolled out a new parent leave policy to promote greater work-life-balance for parents across all countries for its employees. The company is offering all employees globally — male and female — a minimum of 12 weeks paid leave during the first 12 months following the birth or adoption of their child.

Male employees will be eligible for the paternity leave if they have 12 months service at the date the child is born, or for adoptive parents where a child is matched or newly placed with them. "Employees can opt to take a shorter period of leave if they choose, and salaries and benefits will continue to be paid in the normal way," the company release stated.

d) Payment of Gratuity Act, 1972

Applicability

Factories, mines, plantations, oilfields, port, railway company or establishments employing 10 or more persons on any day of the preceding 12 months.

Eligibility:
The employee must have been in continuous service for a period of 5 years. However, this is not necessary in case of death or disablement.

Benefits:
Payment on termination of the employment relation like on superannuation, resignation, disability due to accident or disease, death, retirement
The act provides for payment of gratuity @ 15 days' wages for every completed year of service or part thereof, in excess of seven months.

(Basic +DA) ×15× No of completed years of service or part thereof in excess of 6 months

26

Maximum amount of gratuity payable under the Act is Rs. 20, 00,000.

Gratuity benefits for Govt. Employees:

Retirement Gratuity:

This is payable to the retiring Government servant. A minimum of 5 years' qualifying service and eligibility to receive service gratuity/pension is essential to get this one time lump sum benefit. Retirement gratuity is calculated @ 1/4th of a month's Basic Pay plus Dearness Allowance drawn on the date of retirement for each completed six monthly period of qualifying service. There is no minimum limit for the amount of gratuity. The retirement gratuity payable for qualifying service of 33 years or more is 16 times the Basic Pay plus DA, subject to maximum of Rs. 20 lakhs.

(Basic +DA) × (Total of completed six monthly period of qualifying service)

4

Death Gratuity:

This is a one-time lump sum benefit payable to the nominee or family member of a Government servant dying in harness. There is no stipulation in regard to any minimum length of service rendered by the deceased employee. Entitlement of death gratuity is regulated as under:

Qualifying Service	Rate
Less than one year	2 times of basic pay
One year or more but less than 5 years	6 times of basic pay
5 years or more but less than 11 years	12 times of basic pay
11 years or more but less than 20 years	20 times of basic pay
20 years or more	Half of emoluments for every completed 6 monthly period of qualifying service subject to a maximum of 33 times of emoluments.

Maximum amount of Death Gratuity admissible is Rs. 20 lakhs w.e.f. 1.1.2016

Service Gratuity:

A retiring Government servant will be entitled to receive service gratuity (and not pension) if total qualifying service is less than 10 years. Admissible amount is half month's basic pay last drawn plus DA for each completed 6 monthly period of qualifying service. This one time lump sum payment is distinct from retirement gratuity and is paid over and above the retirement gratuity.

(Basic +DA) × (Total of completed six monthly period of qualifying service)

2

e) Pension benefit after retirement/superannuation (A superannuation pension shall be granted to a Government servant who is retired on his attaining the age of 60 years.

The minimum eligibility period for receipt of pension is 10 years. A Central Government servant retiring in accordance with the Pension Rules is entitled to receive superannuation pension on completion of at least 10 years of qualifying service.

In the case of Family Pension the widow is eligible to receive pension on death of her spouse after completion of one year of continuous service or before even completion of one year if the Government servant had been examined by the appropriate Medical Authority and declared fit for Government service.

W.e.f 1.1.2006, Pension is calculated with reference to average emoluments namely, the average of the basic pay drawn during the last 10 months of the service or last basic pay drawn whichever is beneficial. Full pension with 10/20 years of qualifying service is 50% of the average emoluments or last basic pay drawn whichever is beneficial.

Before 1.1.2006, for qualifying service of less than 33 years, amount of pension was proportionate to the actual qualifying service broken into completed half-year periods. For example, if total qualifying service is 30 years and 4 months (i.e. 61 half-year periods), pension will be calculated as under:-

Pension amount = R/2(X)61/66

where R represents average reckonable emoluments for last 10 months of qualifying service or the last pay drawn as opted by the govt servant.

Minimum pension presently is Rs. 9000 per month. Maximum limit on pension is 50% of the highest pay in the Government of India (presently Rs. 1,25,000) per month. Pension is payable up to and including the date of death.

Commutation of Pension

A Central Government servant has an option to commute a portion of pension, not exceeding 40% of it, into a lump sum payment. No medical examination is required if the option is exercised within one year of retirement. If the option is exercised after expiry of one year, he/she will have to under-go medical examination by the specified competent authority.

Lump sum payable is calculated with reference to the Commutation Table. The monthly pension will stand reduced by the portion commuted and the commuted portion will be restored on the expiry of 15 years from the date of receipt of the commuted value of pension. Dearness Relief, however, will continue to be calculated on the basis of the original pension (i.e. without reduction of commuted portion).

The formula for arriving for commuted value of Pension (CVP) is CVP = 40 % (X) Commutation factor* (X) 12

* The commutation factor will be with reference to age next birthday on the date on which commutation becomes absolute as per the New Table annexed to the CCS (Commutation of Pension) Rules, 1981.

In India, states like Andhra Pradesh government had removed the pension scheme for government employees those who had joined after 2004, November with the motive to cut down the state expenditure and retain revenues.

f) Employees' Provident Fund

Employees' Provident Fund is compulsory for every company in which 20 or more people are employed.

The Employees' Provident Funds and Miscellaneous Provisions Act, 1952

To go into the background of Provident Fund, it is basically a social security provision and provides some financial stability post retirement to employees.

The government-run scheme is a savings scheme which is good for people who are looking for risk-free, guaranteed-return plans for retirement. Employees' Provident Fund is applicable to every employee who works under following establishments and takes salary less than or equals to Rs. 15000/- per month.

- Every establishment which is engaged in any one or more of the industries specified in Schedule I of the Act or any activity notified by Central Government in the Official Gazette. (**List of Industries/Establishments**)

- Employing 20 or more persons.

- Cinema Theatres employing 5 or more persons.

Contributions

By employee 12% of his/her salary

By employer 12% which is an amount equal to an employee contribution.

Withdrawal of Employee's Provident Fund
(In Case of unemployment)
Employee who is a member can now withdraw 75% of their funds after one month of unemployment and maintain their PF account with the body. The retirement fund body also gave an option to its members to withdraw the remaining 25% of their fund after two months of unemployment.

On retirement from service after attaining the age of 55 years. A member who has not attained the age of 55 years at the termination of the service shall withdraw the full amount standing to his/her credit.

In cases of migration from India for a permanent settlement abroad, the withdrawal is allowed. In cases of taking employment abroad, withdrawal is allowed.

In case of permanent disablement
A member can withdraw the total amount from the retirement kitty on retirement on account of permanent and total incapacity for work due to bodily or mental infirmity. This incapacity has to be certified by a medical practitioner. A member who is suffering from tuberculosis or leprosy even if contracted after leaving the service of an establishment on grounds of illness but before the payment has been authorized, shall be deemed to have been permanently incapacitated for work.
India: can withdraw 75% money from PF account in case of unemployment

The Employees' Provident Fund Organisation (EPFO) announced that its members can withdraw 75% of their funds after one month of unemployment and maintain their PF account with the body. The retirement fund body also gave an option to its members to withdraw the remaining 25% of their fund after two months of unemployment. When applying for the withdrawal offline, you are required to fill out the Composite Claim Form which serves the purpose of three forms- **Form 19 (For Final PF Settlement), Form 10C (For Pension Withdrawal) and Form 31 (For Part Withdrawal of PF amount).**

g) Employee's Deposit Linked Insurance Scheme (EDLI)

The EDLI scheme was launched in 1976, and is available to all employers who provide EPF provision to their employees. The scheme offers life insurance coverage to the employees. All the employees who subscribe to the EPF scheme automatically get enrolled in the EDLI scheme.

– EDLI contribution by Employee: none.

– EDLI contribution by Employer: 0.50% (subject to a maximum of Rs.75)

EDLI scheme features and benefits:

- The claim amount under the insurance scheme is 30 times the salary, according to a BankBazaar report. Salary is calculated as (DA + Basic Salary)

- There is also a bonus of Rs 1.5 lakh which will also be paid along with the claim amount.

- The quantum of coverage is directly linked to the salary of the employee.

Claim of EDIL

Only in case of the death of employee who is a contributor to EPF. The EDLI claim is only admissible if the deceased person was in active service at the time of death.

Example:
Let us assume person X was employed and was an active contributor in EPF, EPS and EDLI schemes. His monthly salary was Rs 15,000. Mr. X died on duty. Now when his nominee files for the EDLI claim, it will be (30 x Rs 15,000) + (Rs 1,50,000), which is Rs 6,00,000.

h) General provident fund (GPF)

General Provident fund is a Social Security benefit specifically for the purpose of state and central government employees working in the India. To become a member of general provident fund, employee has to subscribe for its membership by way of contribution from his monthly salary.

Rate   of   Subscription
The amount of subscription is fixed by the subscriber himself. However, it cannot be less than 6% of the basic pay and not more than the basic pay(For class IV employees the percentage is…..). The minimum subscription is determined on the basic pay drawn on 31st March of the preceding financial year. **Subscription may be enhanced twice and/or reduced once during the financial year.**

BENEFITS TO THE MEMBERS OF THE GENERAL PROVIDENT FUND

1) Advance for Purchase of Dwelling Site.
2) Advance for Purchase of Dwelling House/Flat.
3) Advance for Construction of a House.
4) Advance for Repayment of Housing Loan to State Government Housing Board or any other Government recognised Housing Finance Body.
5) Advance for Illness viz. Hospitalization for more than a month major surgical operations or suffering from T.B.,leprosy, paralysis, cancer, heart ailment etc.
6) Advance for Marriage of Self/Son/Daughter/Sister/Brother.
7) Advance for Post Matriculation Education of Son/Daughter.
8) Advance for Damage to the property Due to Natural Calamity (Flood/Earth Quake).
9) Advance for Member affected by cut in the supply of electricity.
10) Advance for Member who is physically handicapped.

The employees can withdraw their money and receive payments within 15 days. Employees can withdraw GPF for select purposes after completing 10 years of service, as against 15 years of service earlier. The money can be withdrawn for purpose of education (which includes primary, secondary and higher education), marriage of self and family members, in emergencies such as illness, buying property, cars and servicing bank loans.

key

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501

1. The relaxed rule for **GPF withdrawal benefit central government employees** as subscribers can withdraw the outstanding money for purpose of children education - including primary, secondary and higher education, covering all streams and institutions.

2. Money can also be withdrawn for expenses such as marriage and other ceremonies of self or family members and dependents, illness of self, family members or dependents and purchase of consumer durables.

3. Government has permitted GPF withdrawal of up to twelve months pay or three-fourth (75%) of the outstanding money in the General Provident Fund, whichever is less. In some cases such as for illness, the withdrawal may be allowed up to 90 per cent of the amount standing at credit of the subscriber.

4. 3/4th or 75% of the total outstanding amount in GPF can be withdrawn for purpose of buying a house, repayment of outstanding housing loan, purchase of land for building a house, constructing a house, reconstructing or making additions on a house already acquired and renovating, additions or alterations of ancestral house.

5. GPF money can also be withdrawn for the purpose of purchasing vehicles, repayment of car loans, repair and overhauling of vehicles and making deposit to book a vehicle.

6. For purchase of vehicle, a central government employee can withdraw 75 % of the amount at disposal in the GPF account or 75 per cent of the cost of vehicle whichever is less.

7. Employees can also withdraw 90% of the money without giving any reason from their provident fund accounts two years before retirement from the job. Earlier the employees were allowed to withdraw 90 per cent of money only a year before their retirement.

8. In further relaxation, head of department of the concerned employee will have the power to sanction withdrawal from the provident fund accounts and no documentary proof will be required to be furnished. An employee would be required to give a simple declaration for the purpose of withdrawal.

9. In case of emergencies such as illness of employee or his or her family member the money from the GPF can be withdrawn within 7 days.

10. The notification on GPF was dated March 7, 2017.

NIGHT-SHIFT ALLOWANCE

According to the labour law, mandates the employer to pay double wage to the worker who works beyond the prescribed working hours or for extra working hours. In addition to the payment of double wage for extra working hours, Night-shift allowance is paid to the workers who does job at night-shift or who does job beyond the prescribed day working hours. Under this

allowance, employee will pay some amount for the purpose of transportation/commuting from his residence to workplace.

In fact, especially in the software companies, many employees who are working at night-shifts are complaining about non-payment of night-shift allowance, but it has mentioned as paid in their salary payslip.

Conveyance allowance

Conveyance allowance is one of the compulsory employee benefits provided for meeting an expenditure incurred by an employee (especially government employee) for commuting from home to office and office to home. In order to claim conveyance allowance by an employee, he or she should reside and work in towns only.

13.Expenditure towards funeral in case of death of an employee.

It is mandatory for an organisation to pay expenditure towards funeral in case of death of an employee while in the course of employment. According to the Section 4(4) of Employee's compensation act 1923, employer is liable to pay funeral expenditure to the dependents of an employee who was killed or if dependents do not exist in such case, funeral expenditure should be paid to the person who actually incurred such expenditure.

Subject In-charge

Bhushan R.Mahajan
Head of Department,
DOME
JD College EM Department
Mechanical Engineering
J D College of Engineering & Management
Nagpur

Principal
J D College of Engineering & Management
Khandala, Katol Road
Nagpur-441501