PURNEA COLLEGE OF ENGINEERING
Purnea

COURSE FILE

OF

POWER SYSTEM-II

B.Tech 6th SEM EE 2022-2026

Faculty Name: Priyanka Rani

Assistant Professor, EE Department

CONTENT

VISION OF THE INSTITUTE

To consistently strive for excellence in engineering education by producing skilled, trained and knowledge-driven engineers who fit into the current and future requirements of industries, organizations, and society thereby contributing to the growth of the country.

MISSION OF THE INSTITUTE

- To improve teaching-learning process while making the existing curriculum more contemporary and in keeping with the requirements of the industry.
- To create an environment for fostering research and development.
- To develop students' soft skills, ethical values, leadership qualities, reasoning and analytical abilities and motivate them to address engineering needs of neighbouring areas.

Vision of EE Department

To produce competent electrical engineers with ethical values addressing the challenges in the field of education, industry and research for the sustainable growth of nation.

Mission of EE Department

- To create an environment for quality technical education and produce engineers who will contribute meaningfully to the growth and development of the country.
- To engage the students in research & development in cutting edge and sustainable technologies.
- To develop professional skills, ethical values and leadership qualities to address the needs of neighboring areas in terms of engineering and technical support.

Program Outcomes

Students who complete the B.Tech. degree in EE will be able to:

PO1: **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations

PO4: **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

PO8: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

After successful completion of program, graduates will be able to

PEO 1	To develop the ability among students to understand the concept of Mathematics, Physics and core electronics subjects which will facilitate understanding of new technology.
PEO 2	Exhibit professionalism, ethical attitude, communication skills, team work in their profession and adapt to current trends by engaging in lifelong learning.
PEO 3	Build new technologies that support to find solution of real-world problems and society.

Program Specific Outcomes of EE:

PSO-1: Identify, analyze, and solve real-life problems by applying the knowledge in Electrical Engineering.

PSO-2: Design and develop electrical systems with the help of automation tools to excel in the field of Electrical engineering.

PSO-3: Find solutions to global issues faced by the society through engineering and technology innovations by upholding professional ethics and social values.

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Institute name	Purnea College of Engineering, Purnea		
Program Name	**B.Tech. EE**		
Course Name	Power System II		
Lecture / Tutorial (per week)	3-0	**Course Credits**	3
Course Coordinator Name	Mrs Priyanka Rani		

Institute / College Name:	PURNEA COLLEGE OF ENGINEERING			
Program Name	B.Tech. EE			
Course Code	103601			
Course Name	**Power System II**			
Lecture / Tutorial / Practical (per week):		3 – 0 - 0	**Course Credits**	3
Session	Jan 2025 – May 2025 (July 2025 – December 2025 University Delay)		**Semester**	7
Course Coordinator Name	Priyanka Rani			

B. Tech. VI Semester (EE) EE Power System II

L T P/D	Total	Max Marks: 100	
3-0-2	4	Final Exam:	70 Marks
		Sessional:	20 Marks
		Internals:	10 Marks.

Text/References:

1. J. Grainger and W. D. Stevenson, "Power System Analysis", McGraw Hill Education, 1994.
2. O. I. Elgerd, "Electric Energy Systems Theory", McGraw Hill Education, 1995.
3. A. R. Bergen and V. Vittal, "Power System Analysis", Pearson Education Inc., 1999.
4. D. P. Kothari and I. J. Nagrath, "Modern Power System Analysis", McGraw Hill Education, 2003.
5. B. M. Weedy, B. J. Cory, N. Jenkins, J. Ekanayake and G. Strbac, "Electric Power Systems", Wiley,2012.

Course Description

This course is designed to introduce the concepts and phenomenon of different sources of Power Generation and to give an idea about the fundamental concepts of electrical power transmission and distribution, both AC & DC. It also imparts knowledge of electrical and mechanical aspects of design of transmission line. It willgive clear understanding of underground cables to the student.

Course Outcomes

Upon completing the course the students will be able to:

CO1	Able to understand the Generation, transmission and Distribution of Power System
CO2	Able to understand the various Power system components
CO3	Able to understand the concept of Power System Network
CO4	Able to understand the basic protection scheme and insulation coordination
CO5	Able to understand the concepts of HVDC Power transmission and renewable energy sources

CO-PO Mapping

COURSE OUTCOMES		POs / PSOs	Classroom Session (Hrs)
CO1	Able to develop mathematical models for analysis and develop programs for power system studies	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO10, PO12, PSO1, PSO2, PSO3,	7
CO2	Able to select proper methodologies of load flow studies for the power network	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2, PSO3,	8
CO3	Able to develop the understanding of contingency Analysis	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12, PSO1, PSO2, PSO3,	10
CO4	Able to understand the monitoring and control of Power System	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO11, PO12, PSO1, PSO2, PSO3,	8
CO5	Able to apply concepts of Stability analysis	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO12, PSO1, PSO2, PSO3,	7

Cognitive Level (CL):
R-Remember, U-Understand, Ap- Apply, An-Analyse, E-Evaluate and C-Create

CO-PO Mapping

CO	PO 1	PO 2	PO 3	PO 4	P0 5	P0 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	1	2	1	1	1	1	0	0	0	0	3	3	2	1
CO2	3	2	2	2	1	1	1	0	0	0	0	3	3	2	2
CO3	2	2	2	2	2	1	1	0	0	0	0	2	3	3	2
CO4	1	2	2	2	1	1		0	0	0	0	1	3	2	3
CO5	1	1	1	1	1	1	1	0	0	0	0	1	2	2	3
Average	2	1.6	1.8	1.6	1.2	1	1	0	0	0	0	1	2.8	2.2	2.2

1-weak, 2-moderate, 3-strong

1. Text Books:

S.No.	Name of Authors/ Books / Publishers
1.	TB1: Elements of Power System Analysis by Stevenson (McGraw Hill)
2.	TB2: Modern Power System by N J Nagrath & Kothari (TMH)
3.	TB3: Elective Power System by Soni, Bhatnagar
4.	TB4: Electrical Power system by C. L. Wadhwa

2. Reference Books

RB1: Principles of Power Systems by V.K Mehta
RB2: Extra High Voltage AC transmission by Rakosh Das Begamudre

Gate Syllabus:

Basic concepts of electrical power generation, ac and dc transmission concepts, Models and performance of transmission lines and cablesSeries and shunt compensation, Electric field distribution and insulators, Distribution systems, Per-unit quantities, Symmetrical components, Symmetrical and unsymmetrical fault analysis, Principles of over- current, differential, directional and distance protection.

Other readings and relevant websites

S. No.	Link of journals, Magazines, websites and Research papers
1.	https://www.youtube.com/watch?v=uy9lZCdkQIM&list=PLD4ED2FAF3C155625
2.	http://nptel.ac.in/courses/108105067/#
3.	https://www.youtube.com/watch?v=fBm1dr_gRBk
4.	http://nptel.ac.in/courses/117105140/
5.	http://www.sakshieducation.com/Engineering/listS.aspx?cid=12&sid=666&chid=1112&tid= 548
6.	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-061-introduction-to-electric-power-systems-spring-2011/#

Syllabus

Topics	**No. of Lectures**	**Weightages**
Evolution of Power Systems and Present-Day Scenario. Structure of a power system: Bulk Power Grids and Micro-grids. Generation: Conventional and Renewable Energy Sources. DistributedEnergy Resources. Energy Storage. Transmission and Distribution Systems: Line diagrams, transmission and distribution voltage levels and topologies (meshed and radial systems). Synchronous Grids and Asynchronous (DC) interconnections. Review of Three-phase systems. Analysis of simple three-phase circuits. Power Transfer in AC circuits and Reactive Power.	**7**	12%
Overhead Transmission Lines and Cables: Electrical and Magnetic Fieldsaround conductors, Corona. Parameters of lines and cables. Capacitance and Inductance calculations for simple configurations. Travelling-wave Equations. Sinusoidal Steady state representation of Lines: Short, medium and long lines. Power Transfer, Voltage profile and Reactive Power. Characteristics of transmission lines. Surge Impedance Loading. Series and Shunt Compensation of transmission lines. **Transformers**: Three-phase connections and Phase-shifts. Three- winding transformers, auto- transformers, Neutral Grounding transformers. Tap-Changing in transformers. Transformer Parameters. Single phase equivalent of three-phase transformers.	**9**	34%

Synchronous Machines: Steady-state performance characteristics. Operation when connected to infinite bus. Real and Reactive Power Capability Curve of generators. Typical waveform under balanced terminal short circuit conditions – steady state, transient and sub-transient equivalent circuits. Loads: Types, Voltage and Frequency Dependence of Loads. Per-unit System and per-unit calculations.		
Generation of Over-voltages: Lightning and Switching Surges. Protection against Over-voltages, Insulation Coordination. Propagationof Surges. Voltages produced by traveling surges. Bewley Diagrams.	**6**	10%
Method of Symmetrical Components (positive, negative and zero sequences). Balanced and Unbalanced Faults. Representation of generators, lines and transformers in sequence networks. Computation of Fault Currents. Neutral Grounding. Switchgear: Types of Circuit Breakers. Attributes of Protection schemes, Back-up Protection. Protection schemes (Over-current, directional, distance protection, differential protection) and their application.	**10**	22%
DC Transmission Systems: Line-Commutated Converters (LCC) andVoltage Source Converters (VSC). LCC and VSC based dc link, Real Power Flow control in a dc link. Comparison of ac and dc transmission. Solar PV systems: I-V and P-V characteristics of PV panels, power electronic interface of PV to the grid. Wind Energy Systems: Power curve of wind turbine. Fixed and variable speed turbines. Permanent Magnetic Synchronous Generators and Induction Generators. Power Electronics interfaces of wind generators to the grid.	**8**	22%

This document is approved by

Designation	**Name**	**Signature**
Course Coordinator	Mrs Priyanka Rani	
H.O.D	Mr. Manoj Kumar Rajak	
Principal	Dr. Manoj Kumar	
Date		

Evaluation and Examination Blue Prints:

Internal assessment is done through quiz tests, presentations, assignments and project work. Two sets of question papers are asked from each faculty and out of these two, without the knowledge of faculty, one question paper is chosen for the concerned examination. The components of evaluations along with theirweightage followed by the University is given below:

Sessional Test	10% + 5% (Weekly Evaluation) + 5% (Weekly Evaluation) Internals
End term examination	70%

Course Plan

Lecture Number	Topics	Web Links for video lectures	Text Book	Page numbers
1 -7	Power Flow Analysis:		1	1-30
	Review of Structure of a Power System and its components.Analysis of Power Flows: Formation of Bus admittance matrix. Real and reactive power balance equations at a node.Load and generator specifications.Application of Numerical Methods for solution of the power flow equations.Computational issues in Large scale Power systems.	https://www.youtube.com/watch?v=97FGAxNHhMw&list=PLL7liBDYa4YYxfxExUu16ezu_90dJacIM&index=2	20%	
8-16	Stability Constraints in Synchronous grid:		2	39 -64
	Swing Equation of a synchronous machine connected to an infinite bus.Power angle curve. Description of the phenomena of loss of synchronism in a single machine infinite bus system following a disturbance like three-phase fault. Analysis using numerical integration of swing equations as well as the Equal Area Criterion. Impact of Stability Constraints on power system operation. Effect of generation rescheduling and series compensation of transmission lines on stability	https://www.youtube.com/results?search_query=stability+constraints+in+synchronous+grids	20%	
17-22	Control of Frequency and Voltage		2	88 -103

	Turbines and speed governors, Frequency dependence of loads, droop control and power sharing.AGC,Generation and Absorption of reactive power by various components of a Power system. Excitation system control in synchronous generators, AVR,shunt compensators,SVC, STATCOM, Tap changing transformers. Power flow control using embedded dc links, phase shifters.	https://www.youtube.com/watch?v=qEJrx5cRA_Y&list=PLxvazjO2EJGoFv2zffAwBm2Bn7F_qa9Gh	20%	
23- 32	Monitoring and Control:		2	107 – 126
	Overview of energy control centre functions: SCADA systems. Phasor measurement units and wide area measurement systems. Contingency Analysis. Preventive Control and Emergency control.	https://www.youtube.com/watch?v=eIHfSBkdejw&list=PLbRMhDVUMngeJSl9wldApgLKaxOBZguzN	20%	
33 - 40	Fault Analysis and Protection Systems		2	128 - 130
	Method of Symmetrical Components. Balanced and unbalanced faults.Representation of generators,lines and transformers in sequence networks. Computation of Fault Current. Neutral Grounding.	https://www.youtube.com/watch?v=8tHYFABhlgw&list=PLqJ0Y2s60r-4fN43VhcdTx2pMHYL4lBrC&index=2	20%	

Students are also advised to go through the NPTEL lectures available on its official website.

Time Table:

6th Semester EE									ROOM NO. 203
Day/ time	10:00-10:50	10:50-11:40	11:40-12:30	12:30-01:20	01:20-02:00	02:00 to 05:00			
MON					LUNCH BREAK				
TUE			PS II						
WED									
THU			PS II						
FRI			PS II						
SAT									

Students' List

S.NO.	Registration No.	Name
1	21103131003	Raman Kumar Verma
2	21103131008	Pallavi Joshi
3	21103131009	Sakshi Mehta
4	21103131011	Muskan Kumari
5	21103131014	Vaibhav Bharti
6	21103131015	Mritunjay Mohan
7	21103131016	Md Jawed
8	21103131018	Ashish Kumar Sharma
9	21103131019	Manish Kumar
10	21103131020	Ranju Kumari
11	21103131022	Dipti Suman
12	21103131023	Md Sharique Akhtar
13	21103131025	Md Kaif Khan
14	21103131028	Sahil Raj
15	21103131029	Sidhartha Yadav
16	21103131031	Prashant Kumar Singh
17	21103131032	Divyanshu Gaurav
18	21103131034	Abhimanyu Kumar
19	21103131035	Surya Pratap Singh
20	21103131036	Dipali Raj
21	21103131037	Anvi Singh
22	21103131038	Avinash Kumar
23	21103131039	Aditya Kumar Pandit
24	21103131042	Aditya Raj
25	21103131043	Abhishek Kumar
26	21103131044	Niharika
27	21103131048	Sefali Shailja
28	21103131049	Pragya Kumari
29	21103131051	Shalini Kumari
30	21103131052	Poonam Kumari
31	21103131054	Aditi Anjana
32	21103131055	Aditya Narayan
33	21103131056	Pramod Kumar Das
34	22103131901	Nandani Priya
35	22103131902	Alok Raj

36	**22103131903**	**Manisha Kumari**
37	**22103131905**	**Aman Kumar**
38	**22103131906**	**Rahul Kumar Yadav**
39	**22103131908**	**Raju Kumar**
40	**22103131909**	**Asmita Kumari**

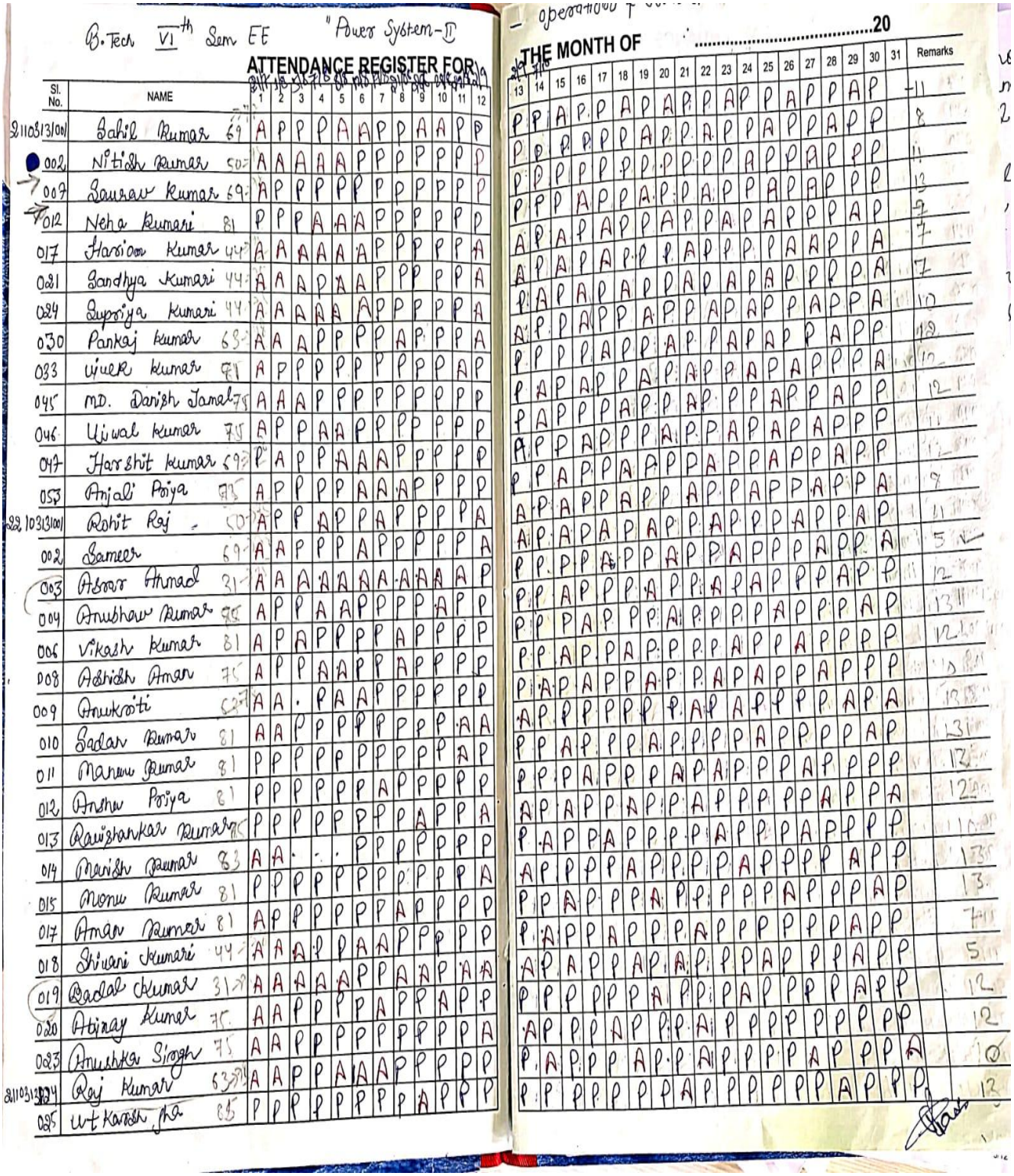
Evaluation Scheme:

Internal assessment is done through quiz tests, presentations and assignments. The components of evaluations along with their weightage followed by the University is given below:

Sessional Test	10% + 5% (Weekly Evaluation) + 5% (Weekly Evaluation)
Attendance	5%
Assignment	5%
End term examination	70%

This Document is approved by:

Designation	**Name**	**Signature**
Course Coordinator	Mrs. Priyanka Rani	
HOD	Mr. Manoj Kumar Rajak	
Date	24/07/2025	

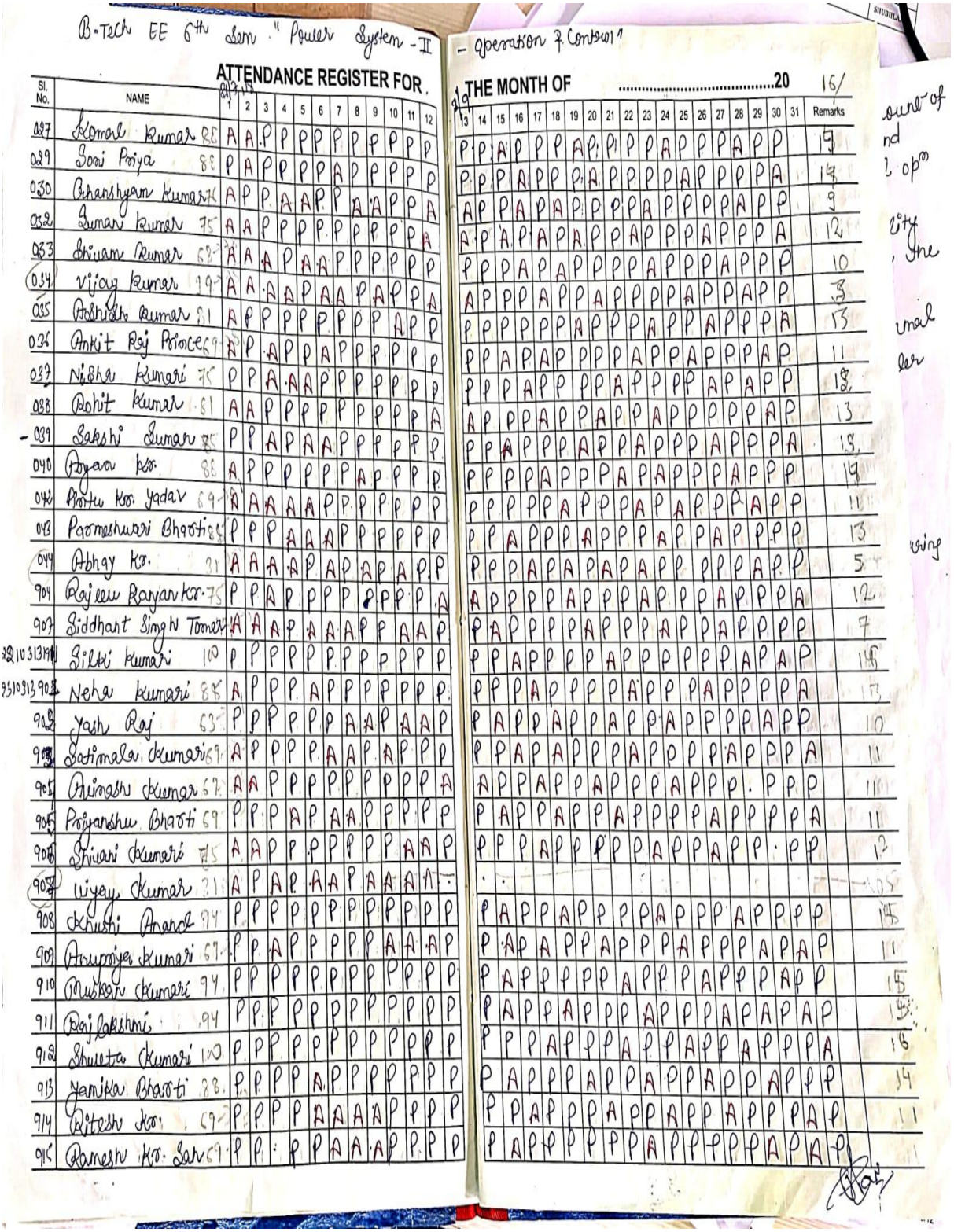


B. Tech VI th Sem EE "Power System-II

ATTENDANCE REGISTER FOR

THE MONTH OF 20

Sl. No.	NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Remarks
2111031001	Sahil Kumar	A	P	P	P	A	A	P	P	A	A	P	P	P	P	A	P	P	A	P	A	P	P	A	P	P	A	P	P	A	P		11
002	Nitish Kumar	A	A	A	A	A	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	P		8
007	Saurav Kumar	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	P		11
012	Neha Kumari	P	P	P	A	A	A	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	A	P	P	P	P		13
017	Haricom Kumar	A	A	A	A	A	A	P	P	P	P	P	A	A	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	A	P		9
021	Sandhya Kumari	A	A	A	P	A	A	P	P	P	P	P	A	A	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		7
024	Supriya Kumari	A	A	A	A	A	A	P	P	P	P	P	A	A	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		7
030	Pankaj Kumar	A	A	A	P	P	P	P	A	P	P	P	A	A	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		7
033	Vivek Kumar	A	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		10
045	MD. Danish Jamal	A	A	A	P	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		10
046	Ujjwal Kumar	A	P	P	A	A	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
047	Harshit Kumar	P	A	P	P	A	A	A	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
053	Anjali Priya	A	P	P	P	P	A	A	A	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		11
22103131001	Rohit Raj	A	P	P	A	P	P	A	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		9
002	Sameer	A	A	P	P	P	A	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		5
003	Asrar Ahmad	A	A	A	A	A	A	A	A	A	A	A	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
004	Anubhav Kumar	A	P	P	A	A	P	P	P	P	A	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		13
006	Vikash Kumar	A	P	A	P	P	P	P	A	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
008	Ashish Aman	A	P	P	A	A	P	P	A	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
009	Anukriti	A	A	.	P	A	A	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		13
010	Sadan Kumar	A	A	P	P	P	P	P	P	P	P	A	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
011	Manoj Kumar	P	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
012	Anshu Priya	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
013	Ravishankar Kumar	P	P	P	P	P	P	P	A	P	P	A	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
014	Manish Kumar	A	A	.	.	.	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		13
015	Monu Kumar	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		13
017	Aman Kumar	A	P	P	P	P	P	P	A	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		7
018	Shivani Kumari	A	A	A	P	P	A	A	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		5
019	Badal Kumar	A	A	A	A	A	P	P	A	A	P	A	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
020	Abhay Kumar	A	A	P	P	P	P	A	P	P	A	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		12
023	Anushka Singh	A	A	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		10
21103131024	Raj Kumar	A	A	P	P	A	A	A	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		13
025	Utkarsh Jha	P	P	P	P	P	P	P	P	A	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A		13



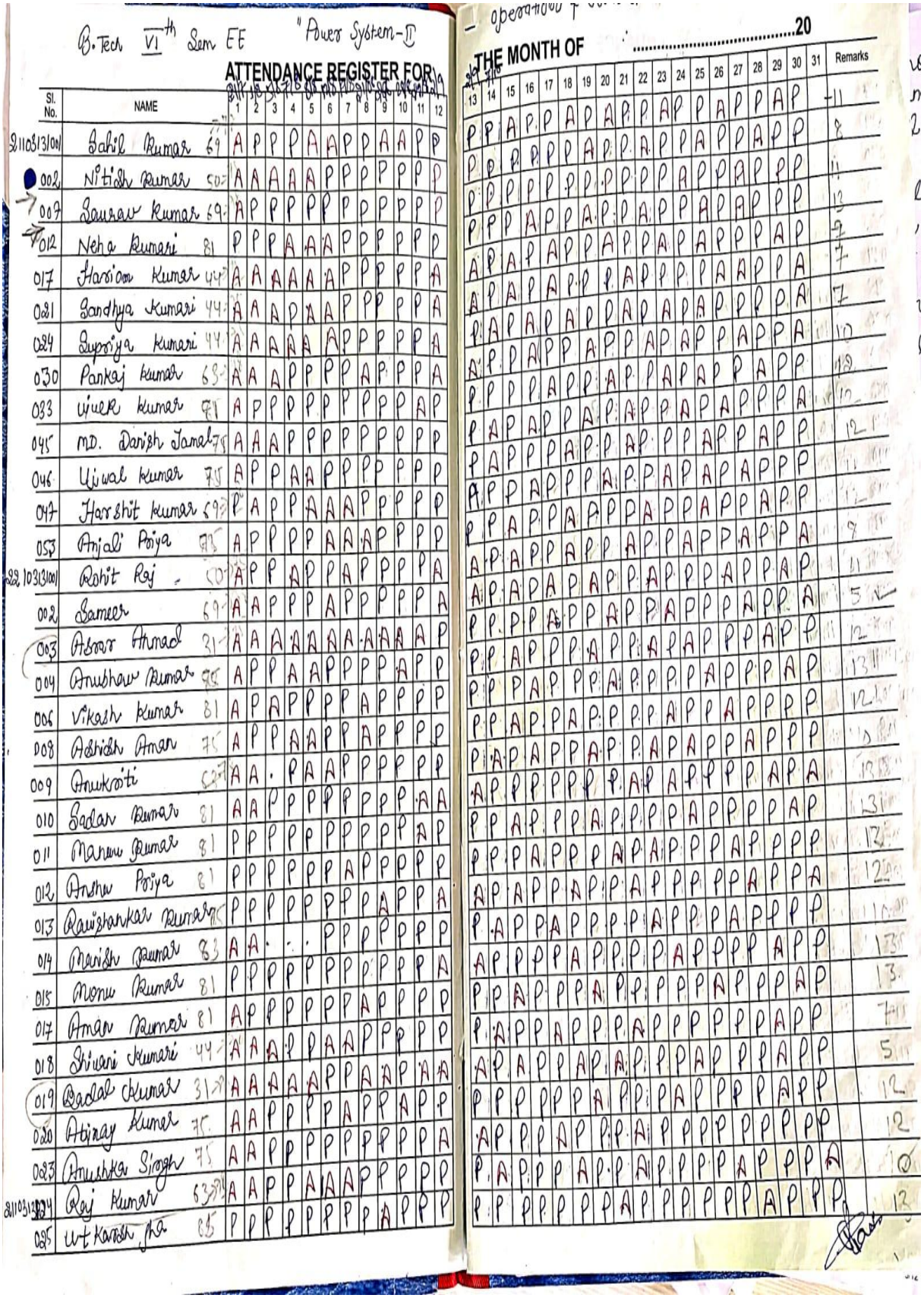
B.Tech EE 6th Sem. "Power System - II

ATTENDANCE REGISTER FOR.

THE MONTH OF 20 16/

Sl. No.	NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Remarks
027	Komal Kumar	A	A	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	P	P	A	P	P	P	A	P	P		15
029	Soni Priya	P	A	P	P	P	P	A	P	P	P	P	P	P	P	P	A	P	P	P	P	A	P	P	P	A	P	P	P	A			14
030	Bhanshyam Kumar	A	P	P	A	A	P	P	A	A	P	P	P	A	P	P	A	P	A	P	P	P	P	A	P	P	P	P	A	P	P		9
032	Suman Kumar	A	A	P	P	P	P	P	P	P	P	P	A	A	P	A	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	12
053	Shivam Kumar	A	A	A	P	A	A	P	P	P	P	P	P	P	P	P	A	P	A	P	P	P	A	P	P	P	A	P	P	P	P		10
034	Vijay Kumar	A	A	A	A	P	A	A	P	A	P	P	A	A	P	P	A	P	P	P	A	P	P	P	A	P	P	A	P	P	P		13
035	Ashish Kumar	A	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A	P	P	P	A	P	P	A	P	P	P	A			13
036	Ankit Raj Prince	A	P	A	P	P	A	P	P	P	P	P	P	P	P	A	P	A	P	P	P	A	P	P	A	P	P	P	A	P			11
037	Nisha Kumari	P	P	A	A	A	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	P	A	P	P	P	A	P	P			18
038	Rohit Kumar	A	A	P	P	P	P	P	P	P	P	P	A	A	P	P	A	P	P	P	A	P	P	P	P	A	P	P	A	P			13
039	Sakshi Kumari	P	P	A	P	A	A	P	P	P	P	P	P	P	A	P	P	A	P	P	P	A	P	P	P	A	P	P	P	A			15
040	Jayan kr.	A	P	P	P	P	P	P	A	P	P	P	P	P	P	A	P	P	P	A	P	P	P	A	P	P	P	A	P	P			14
042	Pintu Kr. Yadav	A	A	A	A	A	P	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	A	P	P	P	A	A	P			11
043	Parmeshwari Bharti	P	P	P	A	A	A	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	P	A	P	P	P	A	P	P			13
044	Abhay Kr.	A	A	A	A	P	A	P	A	P	A	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	P	A	P			5
904	Rajeev Ranjan Kr.	P	P	A	P	P	P	P	P	P	P	P	A	P	P	A	P	P	P	A	P	P	P	A	P	P	P	A	P	P	A		12
907	Siddhant Singh Tomer	A	A	A	P	A	A	A	P	P	A	A	P	P	A	P	P	P	P	A	P	P	P	A	P	P	P	P	P	P			7
32103139	Silki Kumari	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	P	P	P	A	P	A	P				16
35103139	Neha Kumari	A	P	P	P	A	P	P	P	P	P	P	P	P	P	A	P	P	P	P	A	P	P	P	A	P	P	P	P	A			13
902	Yash Raj	P	P	P	P	P	P	A	A	P	A	A	P	P	A	P	A	P	P	A	P	P	P	A	P	P	P	A	A	P			10
903	Satimala Kumari	A	P	P	P	P	A	A	P	A	P	P	P	P	P	A	P	P	P	A	P	P	P	A	P	P	P	A					11
905	Avinash Kumar	A	A	P	P	P	P	P	P	P	P	P	A	A	P	P	A	P	P	A	P	P	P	A	P	P	P	.	P	P	P		11
905	Priyanshu Bharti	P	P	P	A	P	A	A	P	P	P	P	P	P	A	P	A	P	P	A	P	P	P	A	P	P	P	P	P	A			11
908	Shivani Kumari	A	A	P	P	P	P	P	P	P	A	A	P	P	P	P	A	P	P	A	P	P	A	P	P	.	P	P					12
907	Vijay Kumar	A	P	A	P	A	A	P	A	A	A	A	A	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		05
908	Khushi Anand	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	P	A	P	P	P	A	P	P	P				15
909	Anupriya Kumari	P	P	A	P	P	P	P	P	A	A	A	P	P	A	P	P	A	P	P	P	A	P	P	P	A	P	A	P				11
910	Muskan Kumari	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	P	P	P	A	P	P	P	A	P	P	P	A	P				15
911	Raj Lakshmi	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	P	A	P	A	P	A	P						15
912	Shwetta Kumari	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	P	A							16
913	Yamika Bharti	P	P	P	P	A	P	P	P	P	P	P	P	P	A	P	P	P	A	P	P	A	P	P	A	P	P						14
914	Jitesh Kr.	P	P	P	P	A	A	A	A	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	P	A	P						11
915	Ramesh Kr. Sah	P	P	P	P	A	A	A	P	P	P	P	P	P	A	P	P	A	P	P	P	P	A	P	A	P							11

- Operation & Control



B.Tech VI th Sem EE "Power System-II

ATTENDANCE REGISTER FOR THE MONTH OF 20

Sl. No.	NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Remarks
2110313001	Sahil Kumar 69	A	P	P	P	A	A	P	P	A	A	P	P	P	P	A	P	P	A	P	A	P	P	A	P	P	A	P	P	A	P		11
002	Nitish Kumar 50	A	A	A	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		8
007	Saurav Kumar 69	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		11
012	Neha Kumari 81	P	P	P	A	A	A	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	P	A	P	P	A	P		13
017	Hariom Kumar 44	A	A	A	A	A	A	P	P	P	P	P	A	A	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		9
021	Sandhya Kumari 44	A	A	A	P	A	A	P	P	P	P	P	A	A	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		7
024	Supriya Kumari 44	A	A	A	A	A	A	P	P	P	P	P	A	A	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		7
030	Pankaj Kumar 69	A	A	A	P	P	P	A	P	P	P	A	P	A	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		10
033	Vivek Kumar 81	A	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		10
045	MD. Danish Jamal 75	A	A	A	P	P	P	P	P	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
046	Ujwal Kumar 75	A	P	P	A	A	P	P	P	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
047	Harshit Kumar 69	P	A	P	P	A	A	A	P	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		11
053	Anjali Priya 75	A	P	P	P	P	A	A	A	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		8
2211031001	Rohit Raj 50	A	P	P	A	P	P	A	P	P	P	P	A	A	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		11
002	Sameer 69	A	A	P	P	P	A	P	P	P	P	P	A	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		5
003	Abrar Ahmad 31	A	A	A	A	A	A	A	A	A	A	A	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
004	Anubhav Kumar 75	A	P	P	A	A	P	P	P	P	A	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		13
006	Vikash Kumar 81	A	P	A	P	P	P	P	A	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
008	Ashish Aman 75	A	P	P	A	A	P	P	A	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		5
009	Anukriti 53	A	A	.	P	A	A	P	P	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
010	Sadan Kumar 81	A	A	P	P	P	P	P	P	P	P	A	A	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		13
011	Manav Kumar 81	P	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
012	Anshu Priya 81	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
013	Ravishankar Kumar 81	P	P	P	P	P	P	P	P	A	P	P	A	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		11
014	Nevish Kumar 83	A	A	.	.	.	P	P	P	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		13
015	Monu Kumar 81	P	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		13
017	Aman Kumar 81	A	P	P	P	P	P	P	A	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		7
018	Shivani Kumari 44	A	A	A	P	P	A	A	P	P	P	A	A	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		5
019	Badal Kumar 31	A	A	A	A	A	P	P	A	A	P	A	A	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
020	Abiraj Kumar 75	A	A	P	P	P	P	A	P	P	A	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		12
023	Anushka Singh 75	A	A	P	P	P	P	P	P	P	P	P	A	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		10
2211031024	Raj Kumar 63	A	A	P	P	A	A	A	P	P	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		13
025	Utkarsh Jha 85	P	P	P	P	P	P	P	P	A	P	P	P	P	P	A	P	A	P	A	P	P	A	P	P	P	A	P	P	A	P		13

LECTURE PLAN

Topics	Lecture	CO covered
Basic Concepts	**1-7**	
Evolution of Power Systems and Present-Day Scenario. Structure of a power system:	1	CO 3
Bulk Power Grids and Micro-grids.	2	CO 1
Generation: Conventional and Renewable Energy Sources	3	CO 3
Distributed Energy Resources. Energy Storage. Transmission and Distribution Systems:	4	CO1
Line diagrams, transmission and distribution voltage levels and topologies (meshed and radial systems)..	5	CO2
Synchronous Grids and Asynchronous (DC) interconnections. Review of Three-phase systems.	6	CO3
Analysis of simple three phase circuits. Power Transfer in AC circuits and Reactive Power	7	C03
Power System Components	**8-16**	
Overhead Transmission Lines and Cables: Electrical and Magnetic Fields around conductors, Corona. Parameters of lines and cables	8	CO 2
Capacitance and Inductance calculations for simple configurations. Travelling-wave Equations	9	CO 2
Sinusoidal Steady state representation of Lines: Short, medium and long lines	10	CO 2
Power Transfer, Voltage profile and Reactive Power. Characteristics of transmission lines. Surge Impedance Loading. Series and Shunt Compensation of transmission lines.	11	CO 2
Transformers: Three-phase connections and Phase-shifts. Three-winding transformers, autotransformers, Neutral Grounding transformers.	12	CO 2
Tap-Changing in transformers. Transformer Parameters Single phase equivalent of three-phase transformers.	13	CO 2
Synchronous Machines: Steady-state performance characteristics. Operation when connected to an infinite bus. Real and Reactive Power Capability Curve of generators.	14	CO 2
Typical waveform under balanced terminal short circuit conditions – steady state, transient and subtransient equivalent circuits.	15	CO 4
Loads: Types, Voltage and Frequency Dependence of Loads. Per-unit System and per-unit calculations.	16	CO 4
Overvoltages and Insulation Requirements:	**17-22**	
Generation of Overvoltages	17	CO 4
Lightning and Switching Surges.	18	CO 4
Protection against Over-voltages,	19	CO 4
Insulation Coordination. Propagation of Surges	20	CO 4
Propagation of Surges. Voltages produced by traveling surges.	21	CO 4

Bewley Diagrams	22	CO 3
Fault Analysis and Protection Systems:	**23-31**	
Method of Symmetrical Components (positive, negative and zero sequences).	23	CO 2
Balanced and Unbalanced Faults.	24	CO 4
Representation of generators, lines in sequence networks	25	CO 3
Representation transformers in sequence networks	26	CO 3
Computation of Fault Currents. Neutral Grounding.	27	CO 4
Switchgear:Types of Circuit Breakers.	28	CO4
Attributes of Protection schemes, Back-up Protection.,	29	CO 4
Protection schemes (Over-current, directional	30	CO 4
distance protection, differential protection) and their application	31	CO 4
Per Unit System	32	CO 4
Introduction to DC Transmission & Renewable Energy Systems:	**33-40**	
DC Transmission Systems: Line-Commutated Converters (LCC) and Voltage Source Converters (VSC).	33	CO 5
LCC and VSC based dc link, Real Power Flow control in a dc link.	34	CO 5
Comparison of ac and dc transmission.	36	CO 5
Solar PV systems: I-V and P-V characteristics of PV panels, power electronic interface of PV to the grid.	37	CO 5
Wind Energy Systems: Power curve of wind turbine	38	CO 1
Fixed and variable speed turbines. Permanent Magnetic Synchronous Generators and Induction Generators.	39	CO 2
Power Electronics interfaces of wind generators to the grid.	40	CO 3

Power System II(Assignments)

Assignment 1

Date: 19/08/25

1. Derive the equations of various elements of Jacobian matrix in case of Newton Raphson method.

2. Give the comparisons and limitations of GS method and NR method.

3. With neat flow chart, explain the load flow study using Gauss-Seidel method.

Assignment 2

1. Derive the swing equation of a synchronous machine connected to an infinite bus.
2. Explain the working of Automatic Generation Control with diagram.
3. Explain the working of SCADA system.
4. Explain the working of STATCOM with diagram.

- Last date of Submission: 16/10/2025

B.Tech VIth SEM MID TERM EXAM, September 2024

Branch: EE Subject: Power System II
Time: 2 Hrs F.M: 20

CO1	**Able to develop mathematical models for analysis and develop programs for power system studies**
CO2	**Able to select proper methodologies of load flow studies for the power network**
CO3	**Able to develop the understanding of contingency Analysis**
CO4	**Able to understand the monitoring and control of Power System**
CO5	**Able to apply concepts of Stability analysis**

***Note**: Attempt Any Four question from the following and Each question carries 5 Marks:*

1. Determine Y_{bus} for the 3- Bus system. The line series impedances are as follows:
CO1

Line(bus to bus)	Impedance(pu)
1-2	(0.06 + j0.18)
1-3	(0.03 + j0.09)
2-3	(0.08 + j0.24)

2. Using Gauss-Seidel method give a flow chart for a load flow study. CO2
3. In a Three-phase system the currents in the lines a, b and c under abnormal condition of loading were as follows:

$I_a = 100\angle 30^o$, $I_b = 50\angle 300^o$, $I_c = 30\angle 180^o$

Calculate the Zero, Positive and Negative phase sequence currents in line a.
CO3

4. Give the Comparison Between the performance of GS method and NR Method.
CO1
5. Derive the fault Current for 3 phase transmission line under LG Fault condition.
CO5
6. What are the different types of symmetrical component? Explain it with suitable diagram.
CO5

पूर्णियाँ अभियंत्रण महाविद्यालय
पूर्णियाँ - ८५४३०३

PURNEA COLLEGE OF ENGINEERINGPURNEA-854303

MODERATION FORM
MID-SEMESTER QUESTION PAPER QUALITY ANALYSIS

Faculty Name: PRIYANKA RANI			Sem: VI
Subject Name: Power System-II			Max. Marks: 20
Subject Code: 103601			Duration: 2hrs
DEPARTMENT: Electrical Engineering			
S.No.	Assessment Parameters	Remarks	
1	Are the Course Outcomes defined for course, met in the questions asked	~~Yes~~ / No	
2	Are the CO in-line with Blooms Taxonomy level and specified in the Question Paper	~~Yes~~ / No	
3	Is the weightage of questions set for COs specified in the QP appropriate	Yes / No	CO 1: Yes CO 2: Yes CO 3: Yes CO 4: NO CO 5: Yes
4	Rate the strength of questions set	STRENGTH	remarks
		Easy	20%
		Medium	50%
		Tough	30%
5	Time specified is sufficient for the students to attempt them comfortably	~~Yes~~ / No	
6	Does the QP includes mandatory question	Yes / No ✓	
7	Does the QP includes innovative question	Yes / No	
8	Does the QP is in line with University QP format	Yes / No ✓	
Any Other Remarks			

Priyanka Rani 02/09/24	02/09/24	Priyanka Rani 02/09/24
Name & Signature of QP setting Faculty	Name & Signature of Moderating Faculty	Name & Signature of Departmental Academic Co-ordinator

UNIVERSITY QUESTION PAPER

Code : 031508

B.Tech 5th Semester Examination, 2016

Power System-II

Time : 3 hours *Full Marks : 70*

Instructions :

(i) The marks are indicated in the right-hand margin.

(ii) There are Nine questions in this paper.

(iii) Attempt five questions in all.

(iii) ***Question No. 1 is Compulsory.***

---

1. Write short answers of the following (any seven):

7×2=14

(a) What are superheater and reheater?

(b) On what factors does the power output of hydro-plant depends?

P.T.O.

(c) What is load duration curve ? What information does it provides?

(d) Name some of the categories of heat losses in a thermal plant.

(e) Define critical clearing angle in equal area criterion?

(f) Why ash handling plant necessary in thermal power plant?

(g) What is two par tariff?

(h) What is hydrograph? What information does it provides?

(i) List the different methods to improve transient stability

(j) Define the sequence impedances.

2 (a) Define the terms plant capacity factor and plant use factor and explain their importance in an electrical power system. Also explain the effect of the load factor on the cost of generation. 7

(b) The power station supplies the peak loads of 25 MW, 20 MW and 30 MW to three localities. The annual load factor is 0.60 pu and the diversity of the load at the station is 1.65 pu. Calculate 7

(a) The maximum demand on the station.

(b) The installed capacity.

(c) The energy supplied in a year

3. (a) Derive the sequence impedance of transmission lines. 7

(b) A set of unbalanced line currents in a three phase four wire system in as follows:

$$I_a = -j6 \text{ A}, I_b = (-8+j5) \text{ A and } I_c = 7 \text{ A}$$

Determine the zero sequence, positive sequence and negative sequence components of the current. 7

4. (a) Prove that a line-to-ground fault at the terminals for a synchronous generator with solidly grounded neutral is more severe than a three-phase fault. 7

(b) A 100 MVA, 11 KV, three-phase synchronous generator was subjected to different type of faults. The faults currents are as follows:

LG fault–4200 A; LL fault–2600 A; LLL fault-2000 A.

The generator neutral is solidly grounded. Find the per unit values of the three sequence reactances of the generator. 7

5. (a) Distinguish between steady state and transient stability of a power system and also discuss the factors on which these depends. 7

(b) A 100 MVA, 2 pole, 60 Hz generator has a moment of inertia of 50×10^3 kg-m^2. Determine the following: 7

(a) The energy stored in the rotor at the rated speed

(b) The angular Momentum M and

(c) The inertia constant H

9. (a) Explain the interconnection of sequence network for 7

(i) Line-to-line fault.

(ii) Double line-to-ground fault

(b) Explain the equal-area criterion for the stability of an alternator supplying infinite busbars via an inductive interconnector. 7

***

Code : 031508

B.Tech 5th Semester Exam., 2015

POWER SYSTEM—II

Time : 3 hours *Full Marks* : 70

Instructions :

(i) The marks are indicated in the right-hand margin.

(ii) There are ***NINE*** *questions in this paper.*

(iii) Attempt ***FIVE*** *questions in all.*

(iv) Question No. ***1*** *is compulsory.*

1. Write short answer of the following (any *seven*) : 2×7=14

(a) Why is pulverized fuel used?

(b) What is pondage?

(c) What is the necessity of power factor improvement?

(d) What is a single-line diagram?

(e) Define positive sequence impedance.

(f) Name the fault, which do not have zero sequence current flowing.

(g) Define stability limit.

(h) What for surge tank is provided?

(i) What is meant by per unit value of any quantity?

2. (a) What are the functions of economizer and superheater in a thermal power plant? 7

(b) A thermal power plant spends ₹ 25 lakhs in one year as coal consumption. The coal has heating value of 5000 kcal/kg and costs of ₹ 500 per ton. If the thermal efficiency is 35% and electrical efficiency is 90%, find the average load on the power plant. 7

3. (a) What are the factors of selection of site for hydroelectric station? 7

(b) Give a general layout of a hydroelectric power plant. Explain the function of different components in plant. 7

4. (a) Define the following terms in connection with a power supply system : 7

Connected load; Maximum demand; Demand factor and Load factor.

(b) A generating station has a connected load of 450 MW and a maximum demand of 250 MW; the units generated being 615×10^6 per annum. Calculate the demand factor and load factor. 7

5. (a) A synchronous generator rated 500 kVA, 440 V, 0·1 per unit, sub-transient reactance is supplying a passive load of 400 kW at 0·8 lagging power factor. Calculate the initial symmetrical r.m.s. current for a 3-phase fault at the generator terminals. 7

(b) What are current limiting reactors? In what positions are they connected employed in large stations? 7

6. (a) Explain how an unsymmetrical system of 3-phase current can be resolved into three symmetrical component systems. 7

(b) The phase voltage across a certain unbalanced 3-phase load are given as :

$E_A = 176 - j132$, $E_B = -128 - j96$, $E_C = -160 + j100$

Determine the positive, negative and zero sequence components for above voltages. 7

7. (a) Draw the sequence network diagram for the single line to ground fault at the terminal of an unloaded generator. 7

(b) A 10 MVA, 13·8 kV alternator has positive, negative and zero sequence reactance's of 30%, 40% and 5% respectively. What value of resistance must be put in the generator neutral so that the fault current for a line to ground fault of zero fault impedance will not exceed the rated line current? 7

8. (a) Deduce an expression for the maximum steady state power which can be transmitted over a line (neglecting capacitance of the line) if the voltage at each end is kept constant. 7

(b) Derive the swing equation of a synchronous machine swinging against an infinite bus. Clearly state the assumptions made in deducing the swing equation. 7

9. Write short notes on (any *two*) : 7×2=14

(a) Pumped hydroplant

(b) Transient stability

(c) Tariff

★ ★ ★

LIST OF WEAK STUDENTS

(Mid Sem marks less than or equal to 40%)

S. No.	Registration Number	Name	Marks (Mid Sem)
1			

CO ATTAINMENT THROUGH MID SEMESTER EXAM

Mid Term Marks

Sl No	Registration No	Name	Mid Term Marks (20)
1	21103131001	Sahil Kumar	12
2	21103131002	Nitish Kumar	11
3	21103131004	Raj Kumar	15
4	21103131007	Saurav Kumar	19
5	21103131012	Neha Kumari	13
6	21103131017	Hariom Kumar	17
7	21103131021	Sandhya Kumari	13
8	21103131024	Supriya Kumari	11
9	21103131030	Pankaj Kumar	14
10	21103131033	Vivek Kumar	13
11	21103131045	Md Danish Jamal	14
12	21103131046	Ujjwal Kumar	15
13	21103131047	Harshit Kumar	13
14	21103131053	Anjali Priya	10
15	22103131001	Rohit Raj	13
16	22103131002	Sameer	12
17	22103131003	Asrar Ahmad	8
18	22103131004	Anubhav Kumar	17
19	22103131006	Vikash Kumar	19
20	22103131008	Ashish Aman	19
21	22103131009	Anukriti	11
22	22103131010	Sadan Kumar	19
23	22103131011	Mannu Kumar	18
24	22103131012	Anshu Priya	18
25	22103131013	Ravishankar Kumar	16
26	22103131014	Manish Kumar	16
27	22103131015	Monu Kumar	10
28	22103131017	Aman Kumar	19
29	22103131018	Shivani Kumari	10
30	22103131019	Badal Kumar	17
31	22103131020	Abhinay Kumar	14
32	22103131023	Anushka Singh	19
33	22103131025	Utkarsh Jha	18
34	22103131027	Komal Kumar	17
35	22103131029	Soni Priya	19

36	**22103131030**	**Ghanshyam Kumar**	14
37	**22103131032**	**Suman Kumar**	16
38	**22103131033**	**Shivam Kumar**	16
39	**22103131034**	**Vijay Kumar**	16
40	**22103131035**	**Ashish Kumar**	16
41	**22103131036**	**Ankit Raj Prince**	19
42	**22103131037**	**Nisha Kumari**	19
43	**22103131038**	**Rohit Kumar**	18
44	**22103131039**	**Sakshi Suman**	18
45	**22103131040**	**Aryan Kumar**	17
46	**22103131042**	**Pintu Kumar Yadav**	14
47	**22103131043**	**Parmeshwari Bharti**	19
48	**22103131044**	**Abhay Kumar**	18
49	**22103131904**	**Rajeev Ranjan Kumar**	17
50	**22103131907**	**Siddhant Singh Tomar**	14
51	**22103131911**	**Silki Kumari**	17
52	**23103131901**	**Neha Kumari**	19
53	**23103131902**	**Yash Raj**	17
54	**23103131903**	**Satimala Kumari**	11
55	**23103131904**	**Avinash Kumar**	19
56	**23103131905**	**Priyanshu Bharti**	12
57	**23103131906**	**Shivani Kumari**	15
58	**23103131907**	**Vijay Kumar**	10
59	**23103131908**	**Khushi Anand**	19
60	**23103131909**	**Anupriya Kumari**	7
61	**23103131910**	**Muskan Kumari**	19
62	**23103131911**	**Rajlakshmi**	19
63	**23103131912**	**Shweta Kumari**	19
64	**23103131913**	**Yamika Bharti**	18
65	**23103131914**	**Ritesh Kumar**	15
66	**23103131915**	**Ramesh Kumar Sah**	11
67	**23103131916**	**Krishan Kumar**	11
68	**23103131917**	**Kundan Kumar Yadav**	18
69	**23103131918**	**Kanhaiya Kumar**	16
70	**23103131919**	**Vikas Kumar Ram**	18
			15.4

Course Attainment Through Mid Term

Sl No	Registration No	Name	Mid Term						
			CO1	CO1	CO2	CO3	CO5	CO5	Final Marks
			1	2	4				
1	2110313 1001	Sahil Kumar	0	3.5			5	3.5	12
2	2110313 1002	Nitish Kumar	3.5	2			4	4	11
3	2110313 1004	Raj Kumar	5	2		4		4	15
4	2110313 1007	Saurav Kumar	5	4		3.5	5	4.5	19
5	2110313 1012	Neha Kumari		3		2.5	3.5	4	13
6	2110313 1017	Hariom Kumar		5		3.5	4.5	4	17
7	2110313 1021	Sandhya Kumari		2.5		3.5	2	5s	13
8	2110313 1024	Supriya Kumari	2	3		2.5		3	11
9	2110313 1030	Pankaj Kumar		2.5		2.5	4.5	4.5	14
10	2110313 1033	Vivek Kumar		3	2.5		4	3.5	13
11	2110313 1045	Md Danish Jamal		4		3.5	3	3	14
12	2110313 1046	Ujjwal Kumar	2.5	5		3.5		3.5	15
13	2110313 1047	Harshit Kumar	2	4			4	3	13
14	2110313 1053	Anjali Priya		4.5		2.5	3		10
15	2210313 1001	Rohit Raj	3	4		2.5	3		13
16	2210313 1002	Sameer	5	2		2.5	2		12
17	2210313 1003	Asrar Ahmad		3	2		2.5		8
18	2210313 1004	Anubhav Kumar		4		3.5	5	4	17
19	2210313 1006	Vikash Kumar		5		3.5	5	5	19

20	**2210313 1008**	**Ashish Aman**	**5**	**5**			**4**	**4.5**	**19**
21	**2210313 1009**	**Anukriti**	**5**			**5**	**1**		**11**
22	**2210313 1010**	**Sadan Kumar**	**5**	**4**		**5**		**5**	**19**
23	**2210313 1011**	**Mannu Kumar**	**5**			**3.5**	**5**	**4.5**	**18**
24	**2210313 1012**	**Anshu Priya**	**4.5**	**5**			**4.5**	**4**	**18**
25	**2210313 1013**	**Ravishankar Kumar**	**5**	**4**		**3.5**	**3.5**		**16**
26	**2210313 1014**	**Manish Kumar**	**4**	**5**		**2.5**		**4.5**	**16**
27	**2210313 1015**	**Monu Kumar**		**3.5**		**2**	**2**	**2.5**	**10**
28	**2210313 1017**	**Aman Kumar**		**5**		**3.5**	**5**	**5**	**19**
29	**2210313 1018**	**Shivani Kumari**	**1**			**3.5**	**5**		**10**
30	**2210313 1019**	**Badal Kumar**		**5**	**4**	**3.5**		**4**	**17**
31	**2210313 1020**	**Abhinay Kumar**		**5**			**4.5**	**4**	**14**
32	**2210313 1023**	**Anushka Singh**		**4.5**		**5**	**5**	**4.5**	**19**
33	**2210313 1025**	**Utkarsh Jha**	**5**	**5**		**3.5**		**4.5**	**18**
34	**2210313 1027**	**Komal Kumar**	**5**	**4**		**3.5**		**4**	**17**
35	**2210313 1029**	**Soni Priya**		**5**		**3.5**	**5**	**5**	**19**
36	**2210313 1030**	**Ghanshyam Kumar**		**4**	**5**	**2**		**3**	**14**
37	**2210313 1032**	**Suman Kumar**	**3.5**	**5**		**3**		**4.5**	**16**
38	**2210313 1033**	**Shivam Kumar**	**4.5**	**3.5**		**3.5**	**4.5**		**16**
39	**2210313 1034**	**Vijay Kumar**		**4**		**3.5**	**4**	**4**	**16**
40	**2210313 1035**	**Ashish Kumar**		**4**		**2**	**5**	**5**	**16**
41	**2210313 1036**	**Ankit Raj Prince**		**5**		**5**	**4.5**	**4.5**	**19**

42	**2210313 1037**	**Nisha Kumari**	**5**	**4.5**			**5**	**4.5**	**19**
43	**2210313 1038**	**Rohit Kumar**		**5**		**2.5**	**5**	**5**	**18**
44	**2210313 1039**	**Sakshi Suman**		**4**		**5**	**4.5**	**4**	**18**
45	**2210313 1040**	**Aryan Kumar**		**5**	**4**	**3**		**5**	**17**
46	**2210313 1042**	**Pintu Kumar Yadav**	**0**	**5**			**5**	**4**	**14**
47	**2210313 1043**	**Parmeshwari Bharti**		**5**		**4.5**	**5**	**4.5**	**19**
48	**2210313 1044**	**Abhay Kumar**		**5**		**3**	**5**	**4.5**	**18**
49	**2210313 1904**	**Rajeev Ranjan Kumar**	**5**	**4**		**4**		**4**	**17**
50	**2210313 1907**	**Siddhant Singh Tomar**	**5**	**3.5**		**3**		**4**	**14**
51	**2210313 1911**	**Silki Kumari**	**4**	**3**			**4.5**	**5**	**17**
52	**2310313 1901**	**Neha Kumari**	**5**	**4.5**		**5**	**4.5**		**19**
53	**2310313 1902**	**Yash Raj**	**5**	**3.5**		**3.5**		**5**	**17**
54	**2310313 1903**	**Satimala Kumari**	**4**	**3.5**		**3.5**			**11**
55	**2310313 1904**	**Avinash Kumar**		**4.5**		**5**	**5**	**4.5**	**19**
56	**2310313 1905**	**Priyanshu Bharti**		**3**		**4**	**2**	**3**	**12**
57	**2310313 1906**	**Shivani Kumari**	**3**	**4**		**3**	**5**		**15**
58	**2310313 1907**	**Vijay Kumar**		**4**			**3**	**2.5**	**10**
59	**2310313 1908**	**Khushi Anand**	**5**			**4.5**	**5**	**4.5**	**19**
60	**2310313 1909**	**Anupriya Kumari**		**2**	**4.5**				**7**
61	**2310313 1910**	**Muskan Kumari**	**4.5**		**4.5**		**5**	**5**	**19**

62	**2310313 1911**	**Rajlakshmi**	**5**	**4.5**		**5**	**4.5**		**19**
63	**2310313 1912**	**Shweta Kumari**		**4**		**5**	**5**	**5**	**19**
64	**2310313 1913**	**Yamika Bharti**							**18**
65	**2310313 1914**	**Ritesh Kumar**	**3**	**4.5**		**3**		**4**	**15**
66	**2310313 1915**	**Ramesh Kumar Sah**		**5**	**2**		**1**	**3**	**11**
67	**2310313 1916**	**Krishan Kumar**	**1**	**4**		**3.5**	**2.5**		**11**
68	**2310313 1917**	**Kundan Kumar Yadav**	**5**			**3.5**	**5**	**4.5**	**18**
69	**2310313 1918**	**Kanhaiya Kumar**	**5**	**4**		**3.5**	**3**		**16**
70	**2310313 1919**	**Vikas Kumar Ram**		**4**		**3.5**	**5**	**5**	**18**
			2.1	**3.6**	**0.4**	**2.7**	**3.0**	**3.2**	**15.4**

CO ATTAINMENT THROUGH ATTENDANCE

Sl No	Registration No	Name	Attendance Marks (5)
1	21103131001	Sahil Kumar	5
2	21103131002	Nitish Kumar	5
3	21103131004	Raj Kumar	5
4	21103131007	Saurav Kumar	5
5	21103131012	Neha Kumari	5
6	21103131017	Hariom Kumar	4
7	21103131021	Sandhya Kumari	4
8	21103131024	Supriya Kumari	4
9	21103131030	Pankaj Kumar	5
10	21103131033	Vivek Kumar	4
11	21103131045	Md Danish Jamal	5
12	21103131046	Ujjwal Kumar	5
13	21103131047	Harshit Kumar	5
14	21103131053	Anjali Priya	4
15	22103131001	Rohit Raj	5
16	22103131002	Sameer	5
17	22103131003	Asrar Ahmad	3
18	22103131004	Anubhav Kumar	5
19	22103131006	Vikash Kumar	5
20	22103131008	Ashish Aman	5
21	22103131009	Anukriti	3
22	22103131010	Sadan Kumar	5
23	22103131011	Mannu Kumar	5
24	22103131012	Anshu Priya	5
25	22103131013	Ravishankar Kumar	5
26	22103131014	Manish Kumar	5
27	22103131015	Monu Kumar	5
28	22103131017	Aman Kumar	5
29	22103131018	Shivani Kumari	4
30	22103131019	Badal Kumar	4
31	22103131020	Abhinay Kumar	5
32	22103131023	Anushka Singh	5
33	22103131025	Utkarsh Jha	5
34	22103131027	Komal Kumar	5

35	**22103131029**	**Soni Priya**	5
36	**22103131030**	**Ghanshyam Kumar**	5
37	**22103131032**	**Suman Kumar**	5
38	**22103131033**	**Shivam Kumar**	4
39	**22103131034**	**Vijay Kumar**	3
40	**22103131035**	**Ashish Kumar**	5
41	**22103131036**	**Ankit Raj Prince**	5
42	**22103131037**	**Nisha Kumari**	5
43	**22103131038**	**Rohit Kumar**	5
44	**22103131039**	**Sakshi Suman**	5
45	**22103131040**	**Aryan Kumar**	5
46	**22103131042**	**Pintu Kumar Yadav**	4
47	**22103131043**	**Parmeshwari Bharti**	5
48	**22103131044**	**Abhay Kumar**	3
49	**22103131904**	**Rajeev Ranjan Kumar**	5
50	**22103131907**	**Siddhant Singh Tomar**	4
51	**22103131911**	**Silki Kumari**	5
52	**23103131901**	**Neha Kumari**	5
53	**23103131902**	**Yash Raj**	5
54	**23103131903**	**Satimala Kumari**	4
55	**23103131904**	**Avinash Kumar**	4
56	**23103131905**	**Priyanshu Bharti**	5
57	**23103131906**	**Shivani Kumari**	4
58	**23103131907**	**Vijay Kumar**	4
59	**23103131908**	**Khushi Anand**	5
60	**23103131909**	**Anupriya Kumari**	4
61	**23103131910**	**Muskan Kumari**	5
62	**23103131911**	**Rajlakshmi**	5
63	**23103131912**	**Shweta Kumari**	5
64	**23103131913**	**Yamika Bharti**	5
65	**23103131914**	**Ritesh Kumar**	4
66	**23103131915**	**Ramesh Kumar Sah**	5
67	**23103131916**	**Krishan Kumar**	4
68	**23103131917**	**Kundan Kumar Yadav**	5
69	**23103131918**	**Kanhaiya Kumar**	5
70	**23103131919**	**Vikas Kumar Ram**	5
			4.6

CO ATTAINMENT THROUGH ASSIGNMENT

Sl No	Registration No	Name	Assignment					Assignment
			CO1	CO2	CO3	CO4	CO5	Final Marks
1	21103131001	Sahil Kumar	0.5	1.5	0.5	0.5	1	4
2	21103131002	Nitish Kumar	0.5	1	0.5	0.5	0.5	3
3	21103131004	Raj Kumar	0.5	1	0.5	0.5	0.5	3
4	21103131007	Saurav Kumar	0.5	2	0.5	0.5	1.5	5
5	21103131012	Neha Kumari	0.5	1.5	0.5	0.5	1	4
6	21103131017	Hariom Kumar	0.5	1	0.5	0.5	0.5	3
7	21103131021	Sandhya Kumari	0.5	1.5	0.5	0.5	1	4
8	21103131024	Supriya Kumari	0.5	1.5	0.5	0.5	1	4
9	21103131030	Pankaj Kumar	0.5	1	0.5	0.5	0.5	3
10	21103131033	Vivek Kumar	0.5	1.5	0.5	0.5	1	4
11	21103131045	Md Danish Jamal	0.5	1	0.5	0.5	0.5	3
12	21103131046	Ujjwal Kumar	0.5	1	0.5	0.5	0.5	3
13	21103131047	Harshit Kumar	0.5	1	0.5	0.5	0.5	3
14	21103131053	Anjali Priya	0.5	1.5	0.5	0.5	1	4
15	22103131001	Rohit Raj	0.5	1.5	0.5	0.5	1	4
16	22103131002	Sameer	0.5	1.5	0.5	0.5	1	4
17	22103131003	Asrar Ahmad	0.5	1.5	0.5	0.5	1	4
18	22103131004	Anubhav Kumar	0.5	1.5	0.5	0.5	1	4
19	22103131006	Vikash Kumar	0.5	1.5	0.5	0.5	1	4
20	22103131008	Ashish Aman	0.5	1	0.5	0.5	0.5	3
21	22103131009	Anukriti	0.5	1.5	0.5	0.5	1	4
22	22103131010	Sadan Kumar	0.5	2	0.5	0.5	1.5	5
23	22103131011	Mannu Kumar	0.5	1.5	0.5	0.5	1	4

24	**22103131012**	**Anshu Priya**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
25	**22103131013**	**Ravishankar Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
26	**22103131014**	**Manish Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
27	**22103131015**	**Monu Kumar**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
28	**22103131017**	**Aman Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
29	**22103131018**	**Shivani Kumari**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
30	**22103131019**	**Badal Kumar**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**3**
31	**22103131020**	**Abhinay Kumar**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
32	**22103131023**	**Anushka Singh**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
33	**22103131025**	**Utkarsh Jha**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
34	**22103131027**	**Komal Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
35	**22103131029**	**Soni Priya**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
36	**22103131030**	**Ghanshyam Kumar**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**3**
37	**22103131032**	**Suman Kumar**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
38	**22103131033**	**Shivam Kumar**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**3**
39	**22103131034**	**Vijay Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
40	**22103131035**	**Ashish Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
41	**22103131036**	**Ankit Raj Prince**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
42	**22103131037**	**Nisha Kumari**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
43	**22103131038**	**Rohit Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
44	**22103131039**	**Sakshi Suman**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
45	**22103131040**	**Aryan Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
46	**22103131042**	**Pintu Kumar Yadav**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
47	**22103131043**	**Parmeshwari Bharti**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
48	**22103131044**	**Abhay Kumar**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**4**

49	**22103131904**	**Rajeev Ranjan Kumar**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**3**
50	**22103131907**	**Siddhant Singh Tomar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
51	**22103131911**	**Silki Kumari**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
52	**23103131901**	**Neha Kumari**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
53	**23103131902**	**Yash Raj**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
54	**23103131903**	**Satimala Kumari**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
55	**23103131904**	**Avinash Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
56	**23103131905**	**Priyanshu Bharti**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
57	**23103131906**	**Shivani Kumari**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
58	**23103131907**	**Vijay Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
59	**23103131908**	**Khushi Anand**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
60	**23103131909**	**Anupriya Kumari**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**3**
61	**23103131910**	**Muskan Kumari**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
62	**23103131911**	**Rajlakshmi**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
63	**23103131912**	**Shweta Kumari**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
64	**23103131913**	**Yamika Bharti**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
65	**23103131914**	**Ritesh Kumar**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
66	**23103131915**	**Ramesh Kumar Sah**	**0.5**	**1**	**0.5**	**0.5**	**0.5**	**3**
67	**23103131916**	**Krishan Kumar**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
68	**23103131917**	**Kundan Kumar Yadav**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
69	**23103131918**	**Kanhaiya Kumar**	**0.5**	**2**	**0.5**	**0.5**	**1.5**	**5**
70	**23103131919**	**Vikas Kumar Ram**	**0.5**	**1.5**	**0.5**	**0.5**	**1**	**4**
			0.5	**1.5**	**0.5**	**0.5**	**1.0**	**4.1**

CLASS AVERAGE IN CONTINUOUS INTERNAL EVALUATION

CO	Mid Term Exam (20)	Assignment (5)	Attendance (5)	Class Average
CO1	5.7	0.5	4.6	68.54%
CO2	0.4	1.5	4.6	60.26%
CO3	2.7	0.5	4.6	72.14%
CO4	0.0	0.5	4.6	87.32%
CO5	6.2	1.0	4.6	74.57%

CO attainment through End semester

Sl No	Registration No	Name	END SEM Marks(70)
1	21103131001	Sahil Kumar	25
2	21103131002	Nitish Kumar	32
3	21103131004	Raj Kumar	30
4	21103131007	Saurav Kumar	60
5	21103131012	Neha Kumari	38
6	21103131017	Hariom Kumar	49
7	21103131021	Sandhya Kumari	33
8	21103131024	Supriya Kumari	34
9	21103131030	Pankaj Kumar	43
10	21103131033	Vivek Kumar	26
11	21103131045	Md Danish Jamal	52
12	21103131046	Ujjwal Kumar	25
13	21103131047	Harshit Kumar	26
14	21103131053	Anjali Priya	40
15	22103131001	Rohit Raj	31
16	22103131002	Sameer	37
17	22103131003	Asrar Ahmad	33
18	22103131004	Anubhav Kumar	47
19	22103131006	Vikash Kumar	27
20	22103131008	Ashish Aman	46
21	22103131009	Anukriti	40
22	22103131010	Sadan Kumar	41
23	22103131011	Mannu Kumar	58
24	22103131012	Anshu Priya	48
25	22103131013	Ravishankar Kumar	47
26	22103131014	Manish Kumar	53
27	22103131015	Monu Kumar	39
28	22103131017	Aman Kumar	53
29	22103131018	Shivani Kumari	36
30	22103131019	Badal Kumar	11
31	22103131020	Abhinay Kumar	14
32	22103131023	Anushka Singh	41
33	22103131025	Utkarsh Jha	46
34	22103131027	Komal Kumar	47
35	22103131029	Soni Priya	54

36	**22103131030**	**Ghanshyam Kumar**	42
37	**22103131032**	**Suman Kumar**	52
38	**22103131033**	**Shivam Kumar**	48
39	**22103131034**	**Vijay Kumar**	33
40	**22103131035**	**Ashish Kumar**	52
41	**22103131036**	**Ankit Raj Prince**	53
42	**22103131037**	**Nisha Kumari**	50
43	**22103131038**	**Rohit Kumar**	62
44	**22103131039**	**Sakshi Suman**	42
45	**22103131040**	**Aryan Kumar**	41
46	**22103131042**	**Pintu Kumar Yadav**	30
47	**22103131043**	**Parmeshwari Bharti**	46
48	**22103131044**	**Abhay Kumar**	47
49	**22103131904**	**Rajeev Ranjan Kumar**	42
50	**22103131907**	**Siddhant Singh Tomar**	27
51	**22103131911**	**Silki Kumari**	56
52	**23103131901**	**Neha Kumari**	49
53	**23103131902**	**Yash Raj**	54
54	**23103131903**	**Satimala Kumari**	39
55	**23103131904**	**Avinash Kumar**	31
56	**23103131905**	**Priyanshu Bharti**	40
57	**23103131906**	**Shivani Kumari**	47
58	**23103131907**	**Vijay Kumar**	**32**
59	**23103131908**	**Khushi Anand**	61
60	**23103131909**	**Anupriya Kumari**	61
61	**23103131910**	**Muskan Kumari**	67
62	**23103131911**	**Rajlakshmi**	62
63	**23103131912**	**Shweta Kumari**	59
64	**23103131913**	**Yamika Bharti**	40
65	**23103131914**	**Ritesh Kumar**	42
66	**23103131915**	**Ramesh Kumar Sah**	39
67	**23103131916**	**Krishan Kumar**	51
68	**23103131917**	**Kundan Kumar Yadav**	49
69	**23103131918**	**Kanhaiya Kumar**	50
70	**23103131919**	**Vikas Kumar Ram**	43
			42.9

Direct CO Attainment
(30% of Continuous internal evaluation + 70 % of end semester exam)

CO	CIE (Class Avg. %)	ESE (Class Avg. %) (Same Value Assumed for all Cos)	Direct CO Attained (.30 OF CIE + .70 OF ESE)
CO1	68.54%	61.24%	63.43%
CO2	60.26%	61.24%	60.95%
CO3	72.14%	61.24%	64.51%
CO4	87.32%	61.24%	69.07%
CO5	74.57%	61.24%	65.24%

Total CO Attainment
(90% of Direct CO Attainment + 10 % of Indirect CO Attainment)

CO	Direct attained CO %	Indirectly Attained CO % (Course End Survey)	Total CO Attained%
CO1	63.43%	71.71%	64.26%
CO2	60.95%	71.43%	62.00%
CO3	64.51%	82.00%	66.26%
CO4	69.07%	85.14%	70.68%
CO5	65.24%	85.14%	67.23%

CO Attainment Analysis

CO	Target %	Attainment gap(%)	Action Proposed to bridge the gap	Modification of target where achieved
CO1	65.00%	64.26%	0.74%	65.00%
CO2	65%	62.00%	3%	65%
CO3	65%	66.26%	-1%	66.26%
CO4	75%	70.68%	4%	75%
CO5	70%	67.23%	3%	70.00%

PO/PSO Attainment

PO/PSO	CO	Mapping Strength	PO / PSO Attainment (rounded) (in %)
PO1	CO1, CO2, CO3, CO4, CO5,	3	100
PO2	CO1, CO2, CO3, CO4, CO5,	3	100
PO3	CO1, CO2, CO3, CO4, CO5,	3	100
PO4	CO1, CO2, CO3, CO4, CO5,	3	100
PO5	CO1, CO2, CO3, CO4, CO5,	3	100
PO6	CO1, CO2, CO3, CO4, CO5,	3	100
PO7	CO1, CO2, CO3, CO5,	3	80
PO8	CO2, CO3, CO4,	2	65
PO9	CO2, CO3, CO4,	2	65
PO10	CO1, CO2, CO3,	2	63
PO11	CO2, CO3, CO4,	2	65
PO12	CO1, CO2, CO3, CO4, CO5,	3	100
PSO1	CO1, CO2, CO3, CO4, CO5,	3	100
PSO2	CO1, CO2, CO3, CO4, CO5,	3	100

	PO												**PSO**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
Mapping Strength	3	3	3	3	3	3	3	2	2	2	2	3	3	3	3
Attainment	**2**	**2**	**2**	2	2	2	2	2	2	2	2	**2**	**2**	2	**2**

COURSE END SURVEY

Sl No	Registration No	Name	COURSE END SURVEY				
			CO1	CO2	CO3	CO4	CO5
1	21103131001	Sahil Kumar	3	3	5	5	5
2	21103131002	Nitish Kumar	4	4	4	5	5
3	21103131004	Raj Kumar	2	2	3	3	3
4	21103131007	Saurav Kumar	4	4	4	4	4
5	21103131012	Neha Kumari	4	3	5	5	5
6	21103131017	Hariom Kumar	4	4	4	5	5
7	21103131021	Sandhya Kumari	2	2	3	3	3
8	21103131024	Supriya Kumari	4	4	4	4	4
9	21103131030	Pankaj Kumar	4	4	5	5	5
10	21103131033	Vivek Kumar	4	4	4	4	4
11	21103131045	Md Danish Jamal	4	4	5	5	5
12	21103131046	Ujjwal Kumar	4	4	4	5	5
13	21103131047	Harshit Kumar	2	2	3	3	3
14	21103131053	Anjali Priya	4	4	4	5	5
15	22103131001	Rohit Raj	2	2	3	3	3
16	22103131002	Sameer	4	3	4	4	4
17	22103131003	Asrar Ahmad	4	3	5	5	5
18	22103131004	Anubhav Kumar	4	4	4	4	4
19	22103131006	Vikash Kumar	4	4	4	4	4
20	22103131008	Ashish Aman	4	4	5	5	5
21	22103131009	Anukriti	4	4	4	5	5
22	22103131010	Sadan Kumar	2	2	3	3	3
23	22103131011	Mannu Kumar	4	5	4	4	4
24	22103131012	Anshu Priya	4	4	5	5	5
25	22103131013	Ravishankar Kumar	2	2	3	3	3
26	22103131014	Manish Kumar	4	3	4	4	4
27	22103131015	Monu Kumar	2	2	3	3	3
28	22103131017	Aman Kumar	4	3	4	4	4
29	22103131018	Shivani Kumari	4	4	5	5	5
30	22103131019	Badal Kumar	4	4	4	4	4
31	22103131020	Abhinay Kumar	4	4	4	4	4
32	22103131023	Anushka Singh	4	4	5	5	5
33	22103131025	Utkarsh Jha	4	4	4	5	5
34	22103131027	Komal Kumar	2	2	3	3	3

35	**22103131029**	**Soni Priya**	4	5	4	4	4
36	**22103131030**	**Ghanshyam Kumar**	4	4	5	5	5
37	**22103131032**	**Suman Kumar**	4	4	5	5	5
38	**22103131033**	**Shivam Kumar**	4	4	4	5	5
39	**22103131034**	**Vijay Kumar**	2	2	3	3	3
40	**22103131035**	**Ashish Kumar**	4	5	4	4	4
41	**22103131036**	**Ankit Raj Prince**	4	4	5	5	5
42	**22103131037**	**Nisha Kumari**	2	2	3	3	3
43	**22103131038**	**Rohit Kumar**	4	3	4	4	4
44	**22103131039**	**Sakshi Suman**	4	4	5	5	5
45	**22103131040**	**Aryan Kumar**	4	4	4	4	4
46	**22103131042**	**Pintu Kumar Yadav**	4	4	4	4	4
47	**22103131043**	**Parmeshwari Bharti**	4	4	5	5	5
48	**22103131044**	**Abhay Kumar**	4	4	4	5	5
49	**22103131904**	**Rajeev Ranjan Kumar**	2	2	3	3	3
50	**22103131907**	**Siddhant Singh Tomar**	4	5	4	4	4
51	**22103131911**	**Silki Kumari**	4	4	5	5	5
52	**23103131901**	**Neha Kumari**	2	2	3	3	3
53	**23103131902**	**Yash Raj**	4	3	4	4	4
54	**23103131903**	**Satimala Kumari**	4	4	5	5	5
55	**23103131904**	**Avinash Kumar**	4	4	4	4	4
56	**23103131905**	**Priyanshu Bharti**	4	4	4	4	4
57	**23103131906**	**Shivani Kumari**	4	4	5	5	5
58	**23103131907**	**Vijay Kumar**	4	4	4	5	5
59	**23103131908**	**Khushi Anand**	2	2	3	3	3
60	**23103131909**	**Anupriya Kumari**	4	5	4	4	4
61	**23103131910**	**Muskan Kumari**	4	4	5	5	5
62	**23103131911**	**Rajlakshmi**	4	4	4	4	4
63	**23103131912**	**Shweta Kumari**	4	4	4	4	4
64	**23103131913**	**Yamika Bharti**	4	4	5	5	5
65	**23103131914**	**Ritesh Kumar**	4	4	4	5	5
66	**23103131915**	**Ramesh Kumar Sah**	2	2	3	3	3
67	**23103131916**	**Krishan Kumar**	4	5	4	4	4
68	**23103131917**	**Kundan Kumar Yadav**	4	4	5	5	5
69	**23103131918**	**Kanhaiya Kumar**	4	4	5	5	5
70	**23103131919**	**Vikas Kumar Ram**	4	4	4	5	5
			3.6	**3.6**	**4.1**	**4.3**	**4.3**

One Bright student Assignment & Mid Sem Answer Sheet

One Mediocre student Assignment & Mid Sem Answer Sheet

One Weak student Assignment & Mid Sem Answer Sheet

Remedial Methods For Weak Students

Weak students often require additional support to achieve learning outcomes and perform at par with their peers. The following remedial methods can be adopted to enhance their understanding, engagement, and academic performance:

1. Diagnostic Assessment

- Conduct initial assessments to identify students' strengths, weaknesses, and learning gaps.
- Use quizzes, written tests, or oral questioning to pinpoint specific areas needing improvement.

2. Personalized Learning Plans

- Develop individual learning plans based on the diagnostic assessment.
- Include achievable goals, targeted exercises, and timelines for improvement.

3. Extra Classes / Tutorials

- Organize remedial classes outside regular teaching hours.
- Focus on topics that students find difficult, providing step-by-step explanations and practical examples.

4. Peer Tutoring

- Pair weak students with stronger peers for guidance and support.
- Encourages collaborative learning and helps weak students clarify doubts in a comfortable setting.

5. Simplified Study Material

- Provide simplified notes, summaries, flowcharts, and diagrams for better understanding.
- Use visual aids and practical examples to explain complex concepts.

6. Interactive Teaching Methods

- Use interactive methods such as group discussions, problem-solving sessions, and hands-on experiments.
- Encourage students to ask questions and actively participate in learning activities.

7. Continuous Feedback

- Provide regular feedback on assignments, tests, and class participation.
- Highlight areas of improvement and suggest strategies to overcome difficulties.

8. Mentoring and Counseling
    - Assign faculty mentors to provide guidance, motivation, and academic counseling.
    - Address emotional and motivational challenges that may affect learning.
9. Use of Technology
    - Encourage the use of online tutorials, e-learning modules, and educational apps for self-paced learning.
    - Provide access to recorded lectures for revision at any time.
10. Assessment and Remediation
    - Conduct frequent formative assessments to track progress.
    - Provide additional remedial support for topics that continue to be problematic.
11. Encouraging Self-study and Practice
    - Motivate students to practice exercises, previous year questions, and sample papers.
    - Promote time management and effective study habits.
12. Monitoring Progress
    - Maintain a record of students' performance and improvements.
    - Adjust remedial strategies as per individual progress