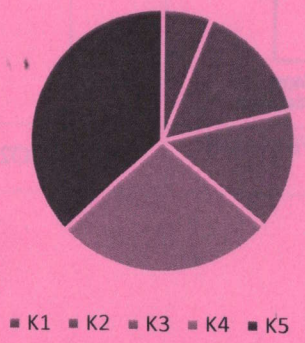
CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

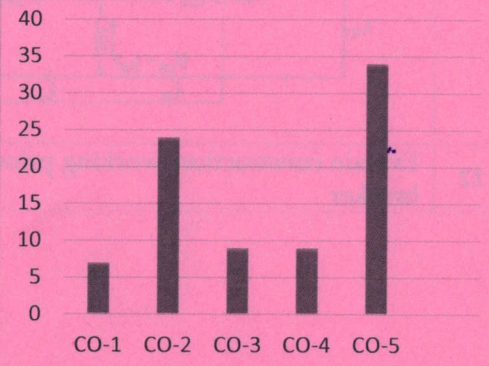
Course Outcomes	CO1	Identify the system protection schemes, and the use of wide-area measurements
	CO2	Understand & relate the different components of a protection system.
	CO3	Provide standards and specifications related to switchgear andprotection.
	CO4	Analyze the basic principles of digital protection
	CO5	Evaluate fault current due to different types of fault in a network.
	CO6	Design the protection schemes for different power system components.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Cource Outcome wise Marks Distribution



ARKA JAIN University Jharkhand | NAAC GRADE A ACCREDITED UNIVERSITY

[18-11-2025]
END SEM EXAMINATION
School of Engineering & IT

Program	**Electrical & Electronic Engineering**	**Branch**	**B. Tech**
Subject Name	**Power System Protection**	**Session**	**Odd, 2025-26**
Semester	**VII**	**Year**	**Nov, 2025**

Time: 3 Hour
Max. Marks : 70

- Start writing from 2nd page onwards; **don't Write on the 1st Page Backside**
- **Answer all Questions of Section A (Compulsory)**
- **Answer Any Four out of Six of Section B**
- **Answer Any Three out of Five of Section C**
- **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s)**.

Knowledge Level (KL)	**K1** : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

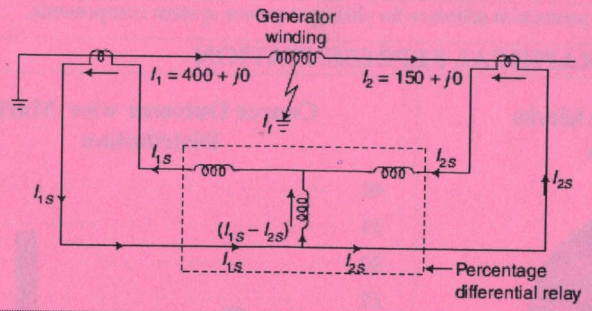
Q. N 1	QUESTIONS	Marks	COs	KL
i	Distinguish between Symmetrical faults and Unsymmetrical faults	2	CO1	K2
ii	What are primary and backup protections?	2	CO2	K1
iii	Difference between numerical and electromechanical relay	2	CO3	K2
iv	A 11000/110 potential transformer is used along with a voltmeter. If the voltmeter rating is 87.5 V Estimate the Value of line voltage	2	CO4	K5
v	Write down the advantages of numerical relay	2	CO3	K2
vi	Why the secondary of current transformer are not open circuited	2	CO3	K4
vii	Write down the properties of SF6 gas	2	CO2	K1
viii	Define PSM and TSM	2	CO4	K1
ix	What happens if Abnormal Running Conditions takes place in generator	2	CO5	K2
x	What do you mean by stator faults and write down its classification	2	CO5	K2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain working principle of percentage differential relay	05	CO1	K4
3	What are the advantages of static relays over electromechanical relays?	05	CO2	K2
4	What are the merits of induction cup construction over the induction disc construction?	05	CO2	K4
5	The current rating of an overcurrent relay is 5 A. The relay has a plug setting of 150% and time multiplier setting (TMS) of 0.4. The CT ratio is 400/5. Determine the operating time of the relay for a fault current of 6000 A. At TMS 1, operating time at various PSM are given in the given Table	05	CO5	K5
6	Write a short note on induction disc type relay	05	CO3	K3
7	Explain the role of microprocessors and digital signal processors (DSPs) in modern protection schemes.	05	CO4	K4

PSM	2	4	5	8	10	20
operating time in sec	10	5	4	3	2.8	2.4

Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
8	Derive the torque equation of induction relays	10	CO2	K4
9	A three-phase, 11 kV/132 kV, D-Y connected power transformer is protected by differential protection. The CTs on the LV side have a current ratio of 500/5. What must be the current ratio of the CTs on the HV side and how should they be connected.	10	CO5	K5
10	For a 132 kV system, the reactance and capacitance up to the location of the circuit breaker is 3 ohms and 0.015 micro faraday respectively. Calculate the following: (a) The frequency of transient oscillation (b) The maximum value of restriking voltage across the contacts of the circuit breaker (c) The maximum value of RRRV	10	CO5	K5
11	A generator winding is protected by using a percentage differential relay whose characteristic is having a slope of 10%. A ground fault occurred near the terminal end of the generator winding while generator is carrying load. As a consequence, the currents flowing at each end of the winding are shown in the Fig. Assuming CT ratios of 500/5 amperes, the relay operate to trip the circuit breakers. 	10	CO5	K5
12	Explain construction ,working principle of SF6 circuit breaker	10	CO2	K3

JGI	**ARKA JAIN University** Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY		**[25-11-2025] END SEM EXAMINATION School of Engineering & IT**
Program	**Electrical & Electronic Engineering**	**Branch**	**B Tech**
Subject Name	**Analog and Digital Communication**	**Session**	**Odd, 2025-26**
Semester	**VII**	**Year**	**Nov, 2025**
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside** • **Answer all Questions of Section A (Compulsory)** • **Answer Any Four out of Six of Section B** • **Answer Any Three out of Five of Section C** • **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s)**.		
Knowledge Level (KL)	**K1 :** Remembering	**K3 :** Applying	**K5 :** Evaluating
	K2 : Understanding	**K4 :** Analysing	**K6 :** Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	Define Modulation and Modulation Index in AM.	2	CO1	K1
ii	Draw the block diagram of Digital Communication.	2	CO2	K2
iii	A carrier wave has amplitude Ac=10 V. It is modulated by a signal with amplitude Am=5 V Find the modulation index.	2	CO4	K2
iv	Define AWGN.	2	CO3	K3
v	Explain the Multiplexing. List out the name of different type of Multiplexing.	2	CO3	K2
vi	Explain Frequency modulation with diagram.	2	CO1	K3
vii	Define Amplitude Shift Keying (ASK) with neat diagram. Why ASK is called ON-OFF keying.	2	CO3	K2
viii	Define the Nyquist theorem.	2	CO5	K3
ix	Describe Equalization and it's use in Digital Communication	2	CO4	K2
x	Explain Aliasing Effect with neat diagram.	2	CO4	K2

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Explain Amplitude modulation with neat diagram. Drive the mathematical expression for Amplitude modulation.	05	CO1	K3
3	Describe Pre emphasis in FM. Draw the Pre emphasis circuit diagram and List out its Characteristics.	05	CO3	K3
4	Compare FDM and TDM.	05	CO5	K3
5	A carrier signal has power Pc=100 W. The modulation index is m=0.6, Find the (i) Total power in the AM wave (ii) Sideband power	05	CO2	K6
6	Explain Delta Modulation with neat diagram.	05	CO5	K4
7	Draw the spectrum of ASK, FSK and PSK.	05	CO1	K3

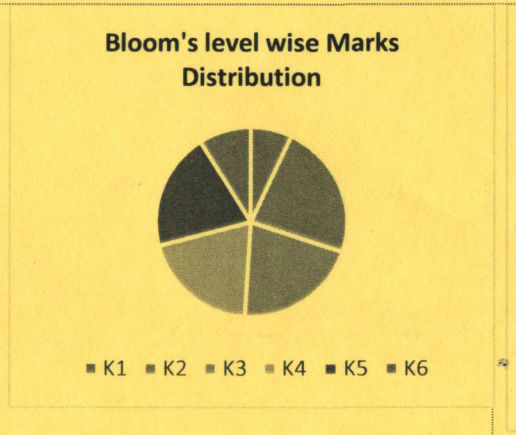
Section C (Answer any THREE out of FIVE) – 20 Marks
(Each question Carry 10 Marks)

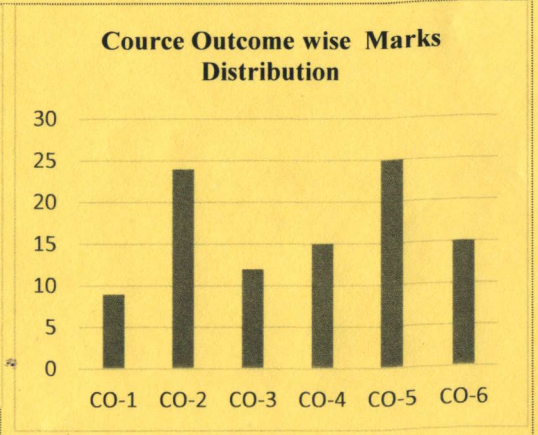
Q. No.	QUESTIONS	Marks	COs	KL
8	A modulating signal m(t)=10cos(2π×103t) is amplitude modulated with a carrier signal c(t)=50cos(2π×105t). Find the modulation index, the carrier power, and the power required for transmitting AM wave.	10	CO1	K5
9	Explain the Pulse Code Modulation with neat block diagram.	10	CO4	K4
10	Describe the Coherent process of generation and detection of ASK.	10	CO2	K4
11	Draw the Spectrum for DSB-SC, SSB-SC & VSB modulation in AM and find the bandwidth required for each.	10	CO3	K4
12	Explain the Terms Sampling and Quantization with neat diagram. Write the use of Nyquist theorem in recovery of original signal.	10	CO5	K6

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Recall the behaviour of a communication system in presence of noise.
	CO2	Compare different Analog modulation schemes for their efficiency and bandwidth
	CO3	Apply different digital modulation schemes and compute the bit error performance
	CO4	Explain different Analysis and Detection of Characteristics of PMS
	CO5	Interpret pulsed modulation system and analyse their system performance
	CO6	Build an innovative technique for Carrier Recovery for Digital modulation..

GRAPHICAL REPRESENTATION





ARKA JAIN University, Jharkhand — NAAC GRADE A, ACCREDITED UNIVERSITY			[22-11-2025] END SEM EXAMINATION School of Engineering & IT
Program	Electrical & Electronic Engineering	Branch	B. Tech
Subject Name	Electrical Drives	Session	Odd, 2025-26
Semester	VII	Year	Nov, 2025
Time: 3 Hour Max. Marks : 70	• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside** • **Answer all Questions of Section A (Compulsory)** • **Answer Any Four out of Six of Section B** • **Answer Any Three out of Five of Section C** • **Possession of Mobile Phone** or any kind of **Written Material, Arguments with the Invigilator or Discussion with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Paper(s)**.		
Knowledge Level (KL)	**K1 :** Remembering	**K3 :** Applying	**K5 :** Evaluating
	K2 : Understanding	**K4 :** Analysing	**K6 :** Creating

Section A (Each question Carry 02 Marks from Q1-i to x – 20 Marks)

Q. N 1	QUESTIONS	Marks	COs	KL
i	List out some advantages of electric drives.	2	CO1	K1
ii	Define synchronous speed.	2	CO6	K3
iii	Name any two starters which can be used with only slip-ring induction motor	2	CO2	K2
iv	What are the advantages and disadvantages of Group drive	2	CO2	K2
v	Mention the Starters used to start an Induction motor.	2	CO6	K3
vi	Why the armature core in D.C machines is constructed with laminated steel sheets instead of solid steel sheets?	2	CO2	K1
vii	Compare electrical and mechanical braking	2	CO6	K2
viii	What is meant by plugging?	2	CO1	K2
ix	What are the types of Single phase induction motors?	2	CO4	K2
x	What are the classes of duties?	2	CO4	K1

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	Write short notes on Multi quadrant Dynamics.	05	CO1	K4
3	Explain with neat circuit diagram, the star-delta starter method of starting squirrel cage induction motor.	05	CO2	K4
4	Explain the various methods of braking of induction motors	05	CO3	K6
5	Draw and describe class B and Class C chopper drive.	05	CO4	K4
6	Compare semi converter drives and full converter drives on the basis of i) Quadrant operation ii) Regenerative braking iii) Power flow iv) harmonic contents	05	CO5	K3
7	A semi converter operated from single phase 230 volt, 50 Hz supply drives a 10HP, 200 volt, 1500rpm, separately excited DC motor. The rated armature current is 40A, the motor parameters Ra=05ohm, La=10mH. KaØ constant =0.2V/rpm. Find out the following parameters α = 300 i) Average Armature Voltage, ii) Back emf of motor iii) Speed of motor iv) Motor torque.	05	CO6	K4

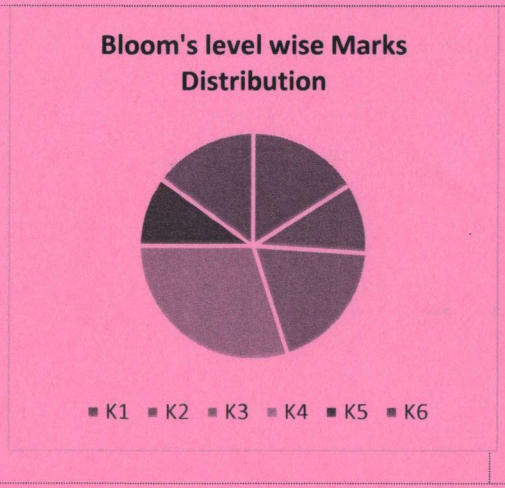
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

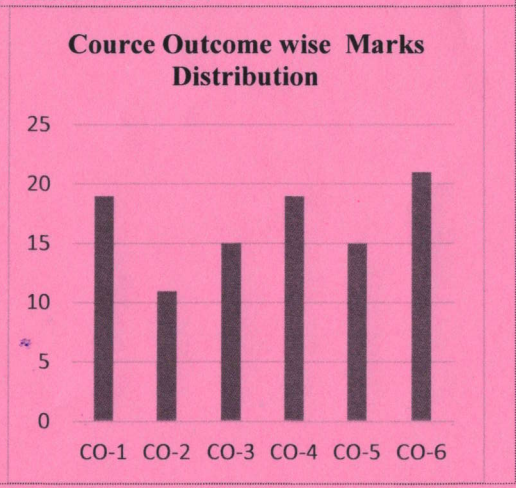
Q. No.	QUESTIONS	Marks	COs	KL
8	Explain the operation & applications of BLDC Motor.	10	CO1	K1
9	Explain the Construction & operation of Permanent Magnet DC Motor.	10	CO3	K6
10	Explain the pole changing, stator frequency variation methods for controlling the speed of AC motor?	10	CO6	K3
11	With neat diagram & waveforms, explain operation of D.C. chopper using power MOSFET.	10	CO5	K4
12	Explain with neat diagram the method of speed control of dc drives using rectifiers.	10	CO4	K5

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Select a suitable DC Motor and Power Electronic Converter package from description of drive requirement – involving load estimation, load cycle considerations, thermal aspects and motor converter matching.
	CO2	Understand the characteristics of dc motors and properties chopper fed DC derive.
	CO3	Apply the principles of speed-control of dc motors.
	CO4	Analyze the characteristics of Induction motor and Scalar control or constant V/f control of induction motor
	CO5	Examine& describe Operation of multi –quadrant dc machines and choppers.
	CO6	Design the power electronic converters used for dc motor and induction motor speed control.

GRAPHICAL REPRESENTATION





JGI ARKA JAIN University Jharkhand — NAAC GRADE A ACCREDITED UNIVERSITY			[20-11-2025] END SEM EXAMINATION School of Engineering & IT
Program	**Electrical & Electronic Engineering**	**Branch**	**B. Tech**
Subject Name	**Power Plant Engineering**	**Session**	**Odd, 2025-26**
Semester	**VII**	**Year**	**Nov, 2025**
Time: 3 Hour Max. Marks : **70**	• Start writing from 2nd page onwards; **don't Write on the 1st Page Backside** • **Answer all Questions of Section A (Compulsory)** • **Answer Any Four out of Six of Section B** • **Answer Any Three out of Five of Section C** • **Possession of Mobile Phones** or any kind of **Written Material, Arguments with the Invigilator or Discussing with Co-Student** will comes under **Unfair Means** and will **Result** in the **Cancellation of the Papers.**		
Knowledge Level (KL)	**K1 :** Remembering	**K3 :** Applying	**K5 :** Evaluating
	K2 : Understanding	**K4 :** Analysing	**K6 :** Creating

Section A (Each question Carry 02 Marks from Q1-i to -x) – 20 Marks

Q. N 1	QUESTIONS	Marks	COs	KL	PO
i	What is a super heater, and its function?	2	CO1	K1	PO2
ii	Write down the merits and demerits of thermal power plants?	2	CO1	K3	PO1
iii	What is the purpose of a draught system in a thermal power plant?	2	CO2	K3	PO3
iv	What do you mean by Feed Water Treatment in thermal power plant?	2	CO2	K5	PO4
v	Write down the advantages of chain grate stoker	2	CO3	K1	PO3
vi	What is the function of Economizer	2	CO3	K2	PO2
vii	Define Otto cycle	2	CO4	K1	PO4
viii	Define the term nuclear fission?	2	CO4	K2	PO4
ix	What is the source of geothermal energy?	2	CO5	K4	PO5
x	Define the term "Load factor".	2	CO5	K6	PO6

Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 5 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	What is a binary cycle in the context of power generation?	5	CO3	K3	PO1
3	Explain different components and operation of gas turbine power plant.	5	CO3	K1	PO1
4	Draw and explain construction and working principle of Boiling Water Reactor (BWR)?	5	CO5	K4	PO4
5	Explain the functioning of Hydro-electric Power Plant with its layout diagram.	5	CO5	K5	PO2
6	Write down the difference between Francis and kaplan turbine.	5	CO6	K1	PO5
7	Explain briefly about pulverised fuel handling system	5	CO4	K6	PO6

Section C (Answer any THREE out of FIVE) – 30 Marks-
(Each question Carry 10 Marks)

Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Describe briefly about the fuel and ash handling in thermal power plant	10	CO3	K3	PO1
9	Explain in detail about combined cycle power plant. State the advantages and disadvantages of open cycle and closed cycle gas turbine power plant.	10	CO2	K4	PO4
10	Draw and explain block diagram of nuclear power plant.	10	CO5	K2	PO4
11	A generating station has a maximum demand of 25MW, a load factor of 60%, a plant capacity factor of 50% and a plant use factor of 72%. Find (i) The reserve capacity of the plant (ii) The daily energy produced and (iii) Maximum energy that could be produced daily if the plant while running as per schedule, were fully loaded.	10	CO6	K3	PO5
12	Write about principle of nuclear energy and chain reaction. Draw and explain the construction and working principle of Pressurized Water Reactor (PWR)?	10	CO4	K6	PO6

CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

Course Outcomes	CO1	Define the working principle of Gas turbine power plant, its layout, safety principles and compare it with plants of other types.
	CO2	Understand the working principle and basic components of the nuclear power plant and the economic and safety principles involved with it.
	CO3	Utilize economics of power plants and list factors affecting the power plants.
	CO4	Analyse the working and operation of steam power plants and the different systems comprising the plant and discuss about its economic and safety impacts.
	CO5	Determine performance of different power plants based on load variations.

GRAPHICAL REPRESENTATION