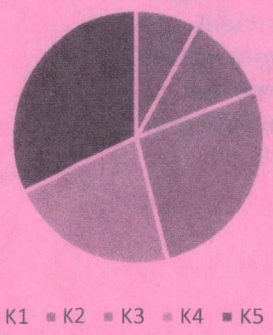
CO- Course Outcomes, **KL**- Knowledge Level, **PO** – Program Outcome

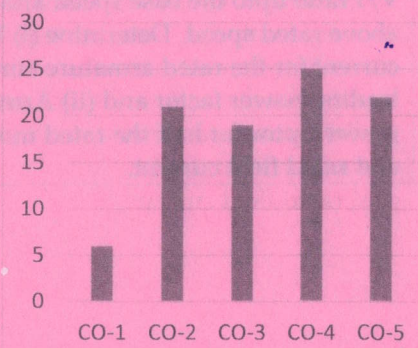
Course Outcomes	CO1	Recognize the operation of power electronic converters and their control strategies.
	CO2	Understand the vector control strategies for ac motor drives.
	CO3	Implement the control strategies using digital signal processors.
	CO4	Analyze the various drives for AC machines.
	CO5	Evaluate the performance parameters for AC drives.
	CO6	Improve the working and design details of frequency-controlled converters used in induction motor drives.

GRAPHICAL REPRESENTATION

Bloom's level wise Marks Distribution



Cource Outcome wise Marks Distribution



JGi	**ARKA JAIN University** Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	**[06-05-2025] END SEM EXAMINATION School of Engineering & IT**
Branch	**Electrical and Electronics Engineering**	**Program**	**B. Tech**
Subject Name	**Professional Elective - VI - Advanced Electric Drives**	**Session**	**Even, 2024-2025**
Semester	**VIII**	**Year**	**May, 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	Boost converter is used to _____	2	CO1	K1
ii	In 3-Φ Fully controlled rectifier calculate the average value of the voltage if the supply is 400 V and firing angle is 15°.	2	CO1	K2
iii	Type-A chopper is used for obtaining which type of mode?	2	CO2	K2
iv	Write the factors governing selection of Electric Motors	2	CO1	K2
v	How does active torque differ from passive torque?	2	CO2	K4
vi	What are the advantages of slip power recovery system?	2	CO3	K1
vii	When it is required to control the induction motor speed during declaration what kind of braking is preferable to employ?	2	CO3	K3
viii	What is meant by rotor resistance control?	2	CO2	K4
ix	Explain in brief two quadrant operation of a dc motor?	2	CO5	K1

x	What are the advantages of V/F control?	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	Explain power and torque capability curves of a synchronous motor drive. In variable frequency control of synchronous motor drive, why V/f ratio is maintained constant upto base speed and voltage constant above base speed.	05	CO2	K4
3	A 220 V, 1500 rpm, 50 A separately excited motor with armature resistance of 0.5 Ω is fed from a three-phase fully controlled rectifier. Available ac source has a line voltage of 440 V, 50 Hz. A star-delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when the converter firing angle is zero. Determine the value of firing angle when: (a) motor is running at 1200 rpm and rated torque and (b) when motor is running at -800 rpm and twice the rated torque.	05	CO5	K3
4	Draw and explain the speed torque characteristics of a variable stator voltage controlled induction motor. Why stator voltage control is not suitable for speed control of induction motor with constant load torque.	05	CO4	K4
5	What are the different methods for obtaining variable output voltage from an inverter? Explain.	05	CO3	K4
6	When a synchronous motor is operating in true synchronous mode, frequency must be varied in steps. Why?	05	CO5	K2
7	Explain the difference between the VSI fed induction motor drive and CSI fed induction motor drive.	05	CO4	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 speed control of separately excited DC motor using combined armature voltage and flux control method. Draw and explain the torque and power capability curves.S	10	CO4	K5
9	Explain the frame transformation from three phase to synchronous reference frame. What is its significance in induction motor drive?	10	CO3S	K3
10	Draw the bock diagram of microprocessor based control of permanent magnet synchronous motor drive	10	CO5	K3
11	A separately excited DC motor fed from a converter can be worked as generator when the firing angle is increased towards 900 and by reversing the armature terminal mechanically. Draw the circuit diagram. Can you realize the same by using a dual converter and without using a mechanical switch?	10	CO2	K5
12	A 5 MW, 3 phase, 11 kV, Y connected , 6 pole, 50 Hz, 0.9 leading power factor synchronous motor has Xs = 9 Ω and Rs = 0 Ω. Rated field current is 50 A. Machine is controlled by variable frequency control at constant V/f ratio upto the base speed and at constant voltage, above rated speed. Determine (i) Torque and field current for the rated armature current, 750 rpm and 0.8 leading power factor and (ii) Armature current and power factor for half the rated motor torque, 1500 rpm and rated field current.	10	CO3	K5

ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[08-05-2025] END SEM EXAMINATION School of Engineering & IT	
Program	Electrical and Electronics Engineering	Branch	B.Tech
Subject Name	Open Elective - VI - Electrical Materials	Session	Even, 2024-2025
Semester	VIII	Year	May, 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	Define dielectric strength and dielectric loss.	2	CO1	K1	PO2
ii	Enlist the types of magnetic material	2	CO1	K3	PO1
iii	What do you mean by doping for semiconductor materials	2	CO2	K3	PO3
iv	Why Magnetostriction is a Reversible Process?	2	CO2	K5	PO4
v	Define Villari effect	2	CO3	K1	PO3
vi	Enlist the types of semiconductors	2	CO3	K2	PO2
vii	What is the Curie point in ferromagnetic materials?	2	CO4	K1	PO4
viii	Define flux-Pinning	2	CO4	K2	PO4
ix	What do you mean by High-temperature semiconductor (HTS)	2	CO5	K4	PO5
x	Write down the application of Epoxy/Fiberglass	2	CO5	K6	PO6

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

Q. No.	QUESTIONS	Marks	COs	KL	PO
2	Explain the phenomenon of dielectric breakdown in solid dielectrics.	5	CO3	K3	PO1
3	Describe the different methods of carrier generation and recombination	5	CO3	K1	PO1
4	What is the difference between thermionic emission and photoelectric emission	5	CO5	K4	PO4
5	Discuss briefly about the atomic concept of ferromagnetism	5	CO5	K5	PO2
6	Write down the application of Semiconductors	5	CO6	K6	PO5
7	Explain the impact of moisture on insulating materials.	5	CO4	K4	PO6

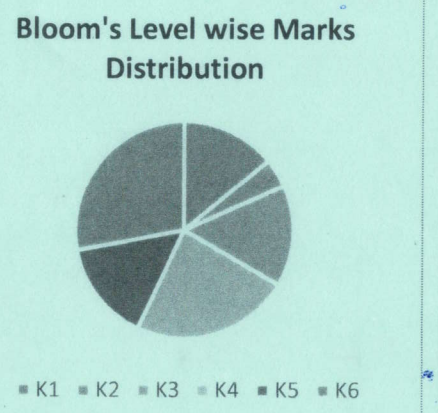
Section C (Answer any THREE out of FIVE) – 30 Marks
(Each question Carry 10 Marks)

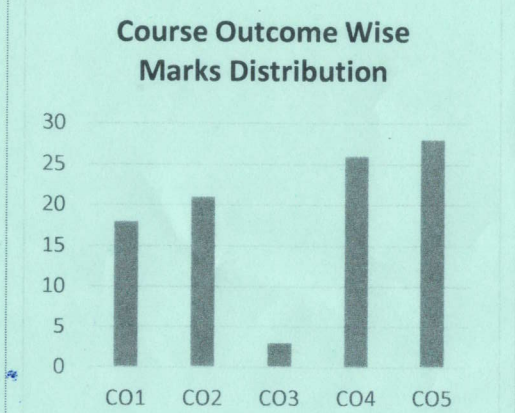
Q. No.	QUESTIONS	Marks	COs	KL	PO
8	Describe briefly about dielectric properties of insulating materials	10	CO3	K3	PO1
9	Explain briefly about B-H Curve of Hard & Soft Magnetic Materials	10	CO2	K4	PO4
10	Explain briefly about Fermi Energy and Carrier Concentration	10	CO5	K2	PO4
11	Describe briefly the Meissner Effect in Perfect Diamagnetic and Superconductor material	10	CO6	K3	PO5
12	Describe briefly various types of polarization in dielectrics	10	CO4	K6	PO6

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

Course Outcomes	CO1	Select insulating, conducting and magnetic materials used in electrical machines.
	CO2	Understand the properties of liquid, gaseous and solid insulating materials.
	CO3	Apply the physics behind the electrical engineering materials.
	CO4	Analyze the electrical properties and characteristics of various materials, used in the electrical appliances, devices & instruments.
	CO5	Create innovative research in the field of electrical engineering material science.

GRAFICAL REPRESENTATION





JGi ARKA JAIN University Jharkhand	NAAC GRADE A ACCREDITED UNIVERSITY	[10-05-2025] END SEM EXAMINATION School of Engineering & IT	
Branch	Electrical and Electronics Engineering	Program	B. Tech
Subject Name	Open Elective- V - VLSI circuits	Session	Even, 2024-2025
Semester	VIII	Year	May, 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	What are different generations of integration circuits?	2	CO1	K1
ii	What is threshold voltage of a MOSFET?	2	CO2	K2
iii	State the various silicon wafer preparations.	2	CO2	K2
iv	State enhancement mode operation of MOS.	2	CO3	K1
v	Draw a neat and clean diagram of the basic CMOS inverter circuit	2	CO5	K6
vi	What are the steps involved in twin-tub process?	2	CO3	K3
vii	What are the various colour coding used in stick diagram?	2	CO6	K1
viii	What is Latch – up?	2	CO4	K2
ix	How dynamic CMOS circuits are faster than static CMOS circuits?	2	CO4	K4
x	What is the basic difference between tasks and functions in VHDL?	2	CO6	K4

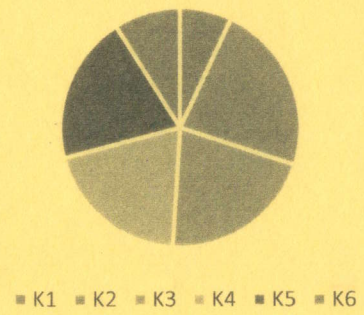
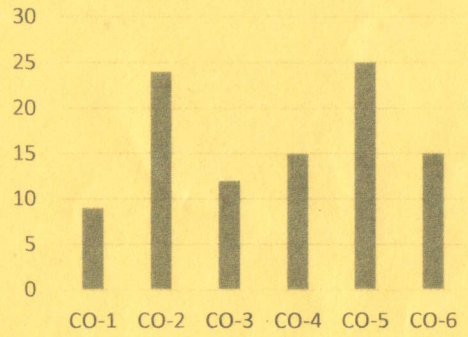
Section B (Answer any FOUR out of SIX) – 20 Marks
(Each question Carry 05 Marks)

Q. No.	QUESTIONS	Marks	COs	KL
2	With neat diagrams explain the steps involved in the p-well fabrication process.	05	CO2	K2
3	How do you calculate the sheet resistance and area of capacitance for a MOSFET?	05	CO4	K4
4	Briefly discuss about Verilog operators.	05	CO6	K3
5	Discuss the steps of n-well CMOS fabrication process with suitable diagram.	05	CO5	K3
6	How NOR and NAND gates are implemented using serial and parallel connected FETs.	05	CO5	K5
7	Explain about the chip design Hierarchy with neat diagrams.	05	CO3	K2

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

Q. No.	QUESTIONS	Marks	COs	KL
8	Explain in detail about the ideal I-V characteristics of nMOS and pMOS devices.	10	CO4	K4
9	Describe in details about the MOSFET switch model and square law model.	10	CO2	K2
10	What is the use of test bench in Verilog HDL? Write the Verilog code for D-flip flop.	10	CO6	K5
11	Construct the voltage transfer characteristics of CMOS inverter and explain the different regions of operation.	10	CO5	K6
12	Draw the implementation of complex logic expression using CMOS gate. $Y = \overline{(A+B+C).D}$. Implement and explain tristate inverter using CMOS.	10	CO3	K5

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

Course Outcomes	CO1	Recognize the scale of integration for VLSI design.
	CO2	Understanding the processes for VLSI fabrication.
	CO3	Solve the performance issues in circuit layout.
	CO4	Analyze circuits using both analytical and CAD tools.
	CO5	Interpret logic circuits with different design styles.
	CO6	Create appropriate automation algorithms for partitioning, floor planning, placement and routing.

GRAPHICAL REPRESENTATION