Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (S) Examination January 2026 (2024 Scheme)

Course Code: GZEST204

Course Name: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Max. Marks: 60 Duration: 2 hours 30 minutes

- ***Use separate answer sheets for Part 1 and Part 2***
- ***No separate minimum marks are required to pass.***

PART 1

ELECTRICAL ENGINEERING (30 Marks)

PART 1-A
Module (1 & 2)

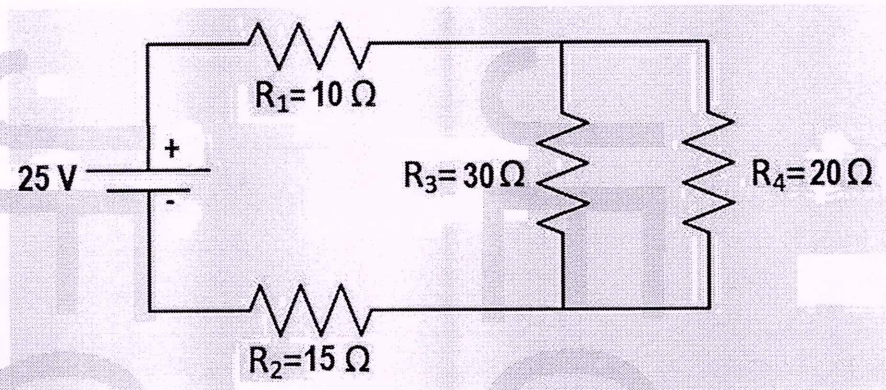
	Answer all questions. Each question carries 3 marks	CO	Marks
1	State and explain Faraday's laws of electromagnetic induction.	CO1	3
2	Prove that the power consumed is zero in a purely inductive circuit when an alternating sinusoidal voltage is applied.	CO1	3
3	Explain the need for earthing in electrical installations.	CO2	3
4	Illustrate the power stages in a DC motor using a neat block diagram.	CO3	3

PART 1-B
Module (1&2)

Answer any one full question from each module. Each question carries 9 marks

Module 1

5	a)	Determine the current drawn from the 25V source by the circuit shown below. Hence, determine the currents through resistors R_3 and R_4.	CO1	5



	b)	Define active power, reactive power, apparent power and power factor of an ac circuit.	CO1	4
6	a)	Derive the relationship between phase and line values for voltages and currents in a 3-phase Delta connected system.	CO1	5
	b)	A resistor of 5Ω, an inductor of 0.2 H and a capacitor of 100 μF are connected in series across a 230 V, 50 Hz, single-phase ac supply. Determine i) Inductive and capacitive reactances ii) Impedance iii) Current drawn from the supply and iv) Power factor of the circuit	CO1	4

Module 2

7	a)	With a neat sketch, describe the working of a Solar Photovoltaic system.	CO2	5
	b)	Explain the working principle of a Transformer.	CO2	4
8	a)	Draw a neat schematic diagram of a Nuclear power plant and explain its operation.	CO2	5
	b)	With a neat sketch, explain the working of RCCB.	CO2	4

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PART 2:

ELECTRONICS ENGINEERING (30 Marks)

PART 2-A
Module (3 & 4)

Answer all questions. Each question carries 3 marks

			CO	Marks
1		Draw AND gate and OR gate using NAND gates only, show its truth tables are same.	CO 4	3
2		Explain any three types of fixed capacitors.	CO 4	3
3		Explain the working of capacitive sensor	CO 5	3
4		Draw architecture of IOT	CO 6	3

PART 2-B
Module (3 & 4)

Answer any one full question from each module. Each question carries 9 marks

Module 3

5	a)	Explain the working of a transistor as an amplifier	CO 4	5
	b)	Explain the VI characteristics of a PN junction diode and describe its behavior in forward bias and reverse bias.	CO 4	4
6	a)	Explain the working of Bridge Rectifier with neat diagrams.	CO 4	5
	b)	Explain the working of a simple zener voltage regulator.	CO 4	4

Module 4

7	a)	Explain the working of Thermocouple.	CO 5	5
	b)	Explain the working principal of proximity sensor and discuss one application of it.	CO 5	4
8	a)	Explain how IOT is used in the implementation of smart street lighting and smart parking systems, and discuss the benefits of these applications in a smart city.	CO 6	9

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