Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (R) Examination May 2025 (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

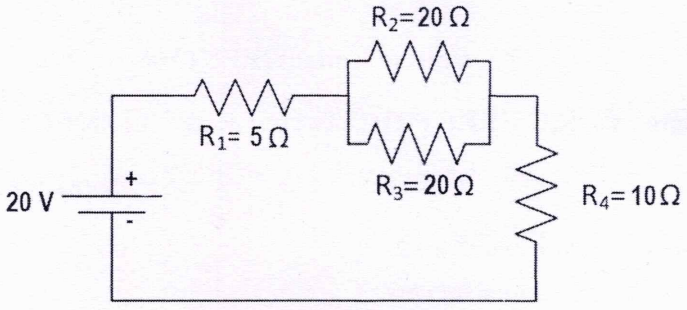
		CO	Marks
1	State and explain Kirchhoff's laws.	CO1	3
2	Prove that for a sinusoidal voltage, RMS value is 0.707 times its maximum value.	CO1	3
3	Explain 3-phase, 3- wire and 3-phase, 4- wire AC power supply schemes.	CO2	3
4	List the different types of DC motors and state the application of each type.	CO3	3

PART 1-B
Module (1&2)

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

Module 1

			CO	Marks
5	a)	Explain the generation of AC voltage using a neat diagram.	CO1	4

	b)	For the circuit shown in figure, determine (i) the current drawn from the 20V source and (ii) the power dissipated in the 5 Ω resistor. 	CO1	5
6	a)	Derive the relationship between phase and line values for voltages and currents in a 3-phase star-connected system	CO1	5
	b)	A resistor of 10Ω and an inductor of 0.5H are connected in series across a 230 V, 50Hz, single-phase ac supply. Determine i) Inductive reactance ii) Impedance iii) Current drawn from the supply and iv) Voltage across the inductor.	CO1	4
		Module 2		
7	a)	Using a neat diagram, explain the working of a Wind Energy Conversion System.	CO2	5
	b)	Distinguish between Feeder, Distributor and Service mains in a secondary distribution system.	CO2	4
8	a)	Draw a neat schematic of a Hydroelectric power plant and explain its working.	CO2	5
	b)	With a neat sketch, explain Pipe earthing.	CO2	4

PART 2

ELECTRONICS ENGINEERING (30 Marks)

PART 2-A

Module (3 & 4)

Answer all questions. Each question carries 3 marks

			CO	Marks
1		Find the binary equivalent of (i) $(56)_{10}$ (ii)$(102)_{10}$	CO 4	3
2		Illustrate how the transistor works as an amplifier.	CO 4	3
3		Explain the working of Ultrasonic proximity sensors.	CO 5	3
4		Define Internet of Things (IoT) and explain its significance in modern technology.	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)	What are the different types of capacitors? Find the value of the capacitor coded as 104.	CO 4	5
	b)	Sketch the V-I characteristics of a PN junction diode and describe its biasing conditions.	CO 4	4
6	a)	Draw the block diagram of regulated power supply and explain each block.	CO 4	5
	b)	Explain base width modulation and its effects on the working of transistor.	CO 4	4

Module 4

7	a)	Explain the working of the sensor used to find the pressure of liquid or gas.	CO 5	5
	b)	Discuss the role of IoT in transforming traditional street lighting into smart street lighting. Explain the components and benefits that are associated with such a system.	CO 6	4
8	a)	Explain the working of a piezoelectric accelerometer.	CO 5	5
	b)	With the help of a block diagram, explain the architecture of IoT.	CO 6	4