Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S2 (R,S) Examinations April 2026 (2024 Scheme)

Course Code: GZEST204

Course Name: BASIC ELECTRICAL & 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	Derive the relation between line voltage and phase voltage in a balanced 3-phase star connected system.	CO1	3
3	Explain the need for earthing in an electrical installation.	CO2	3
4	Illustrate the working of a solar power plant with block diagram.	CO2	3

PART 1-B

Module (1&2)

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

Module 1

5	a)	Find the rms value, average value and form factor of a half wave rectified sine wave.	CO1	6
	b)	An alternating current of frequency 60 Hz has a maximum value of 120 A. Write down the equation for its instantaneous value. Reckoning time from the instant the current is zero and is becoming positive, find (a) the instantaneous value after 1/360 second and (b) the time taken to reach 96 A for the first time.	CO1	3
6	a)	The load in each branch of a delta-connected balanced 3-phase circuit consists of an	CO1	6

inductance of 0.0318 H in series with a resistance of 10 Ω. The line voltage is 400 V at 50 Hz. Calculate

(i) the line current

(ii) the total power in the circuit.

	b)	State and explain Kirchoff's laws.	CO1	3

Module 2

7	a)	Draw the schematic diagram of a hydroelectric power plant. Explain its working.	CO2	5
	b)	Explain the classification of DC motors. Mention the application of each motor.	CO3	4
8	a)	Illustrate the power stages in a DC motor and explain electrical, mechanical and overall efficiencies.	CO3	3
	b)	Explain the principle of operation of RCCB with schematic diagram.	CO2	3
	c)	Explain the principle of operation of a transformer.	CO2	3

PART 2 - ELECTRONICS ENGINEERING (30 Marks)

PART 2-A
Module (3 & 4)

		Answer all questions. Each question carries 3 marks	CO	Marks
1		A resistor is coded with RED, RED, ORANGE, GOLD. Find the maximum and minimum resistance values by considering the tolerance.	CO 4	3
2		Illustrate the working of a simple Zener voltage regulator.	CO 4	3
3		Briefly explain any three applications of strain gauge.	CO 5	3
4		Explain the working principle of capacitive proximity sensor.	CO 5	3

PART 2-B
Module (3 & 4)
Answer any one full question from each module. Each question carries 9 marks

Module 3

5	a)	With the help of relevant sketches, explain the regions of operation of a transistor.	CO 4	5
	b)	Realize AND gate and OR gate using NAND gate only.	CO 4	4
6	a)	Summarize the working of a full wave bridge rectifier with the help of neat diagrams. Also, discuss the next circuit, which can eliminate the ripples present in the rectified output.	CO 4	5
	b)	Describe the components and operation of a public address system (PAS) with block diagram.	CO 4	4

Module 4

7	a)	Explain the terms accuracy, precision, sensitivity, and resolution in the context of an instrumentation system with examples.	CO 5	5
	b)	Explain the functions of each layer in the architecture of IoT.	CO 6	4
8	a)	Discuss the working of a sensor that works on the principle of the Seebeck effect. Also, mention its applications.	CO 5	5
	b)	Briefly describe the basic concept of implementing a smart street light system using IoT.	CO 6	4

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