D **803B1** **Total pages: 2**

Register No: …… Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FRESHER ODD (SEMESTER 1) B.TECH DEGREE EXAMINATION (R), NOVEMBER 2024

Food Technology

(2024 SCHEME)

Course Code	**:**	**24EST1005-G**
Course Name	**:**	**Fundamentals of Electrical and Electronics Engineering**
Max. Marks	**:**	**60** **Duration:2.5 Hours**

PART I: ELECTRICAL ENGINEERING

Part I to be answered in pages 1 to 15

PART A

(Answer all questions. Each question carries 3 marks)

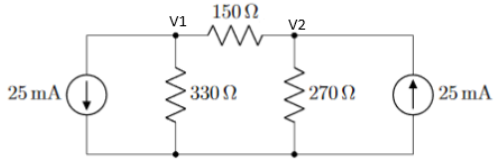
1. Write the equation for temperature co-efficient of resistance.
2. Explain the two types of EMF produced according to Faraday's Law.
3. Distinguish between analog and digital modes of operation of measuring devices.
4. Distinguish between direct and indirect methods of measurement.

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

5. Find the node voltages V_1 and V_2 6



OR

6. How much more current can be safely drawn from a 120 V outlet fused at 15 A, if a 600 W curling iron and a 1200W hair dryer are already operating in the circuit? 6

MODULE II

7. a) Explain self induced EMF. 3
   b) Two identical coils P & S each having 500 turns lie in parallel planes.Current in coil P changing at the rate of 500 A/second induces emf of 12 Volts in coil S.Calculate the mutual inductance between the two coils.If the self inductance of each coil is 50 mH,calculate the flux produced in coil P per ampere of current and coeficient of coupling between the two coils. 3

OR

8. An iron ring of cross-sectional area $1cm^2$ is wound with a coil of 2000 turns. Calculate the magnetising current required to produce a flux of 0.1 mWb in the iron path if mean length of the path is 30 cm and relative permeability of iron is 2500. Neglect magnetic leakages and fringing. 6

MODULE III

9.	a) Define cycle and frequency in an ac circuit. b) Derive the average and RMS value of a sinusoidal voltage waveform.	2 4
	OR	
10.	Classify the instruments based on their measurements.	6

PART II: ELECTRONICS ENGINEERING

Part II to be answered in pages 16 to 30

PART A

(Answer all questions. Each question carries 3 marks)

11. Explain the working of PN junction in semiconductors?
12. Identify the significance of a "cell" in mobile communication?
13. What is the purpose of a load cell?
14. Explain the working principle of a solenoid?

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE IV

15.	Can you discuss how the operating point of a transistor influences its amplification capabilities in a common emitter configuration?	6
	OR	
16.	Compare the characteristics and applications of PNP and NPN transistors in electronic circuits.	6

MODULE V

17.	Can you describe the main blocks in a typical DC power supply block diagram and explain the function of each block?	6
	OR	
18.	Compare the principles of Amplitude modulation and frequency modulation with the help of waveforms.	6

MODULE VI

19.	Explain the working principle of an LVDT. How it is used as position sensor?	6
	OR	
20.	How do light sensors convert light energy into electrical signals? Explain the underlying principles using the example of solar cell.	6

****