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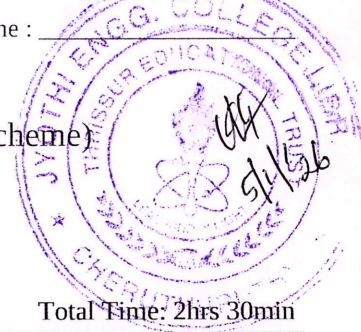
Name : _____



Jyothi Engineering College(Autonomous)

B. Tech Degree S1 (R) Examination, December 2025 (2025 Scheme)

25EST104- INTRODUCTION TO ELECTRICAL AND ELECTRONICS ENGINEERING



Total Mark: 60

Total Time: 2hrs 30min

General Instructions

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

CO MARK

Part 1: Electrical Engineering (30 Marks)

PART 1-A

Answer All Questions. Each question carries 3 marks

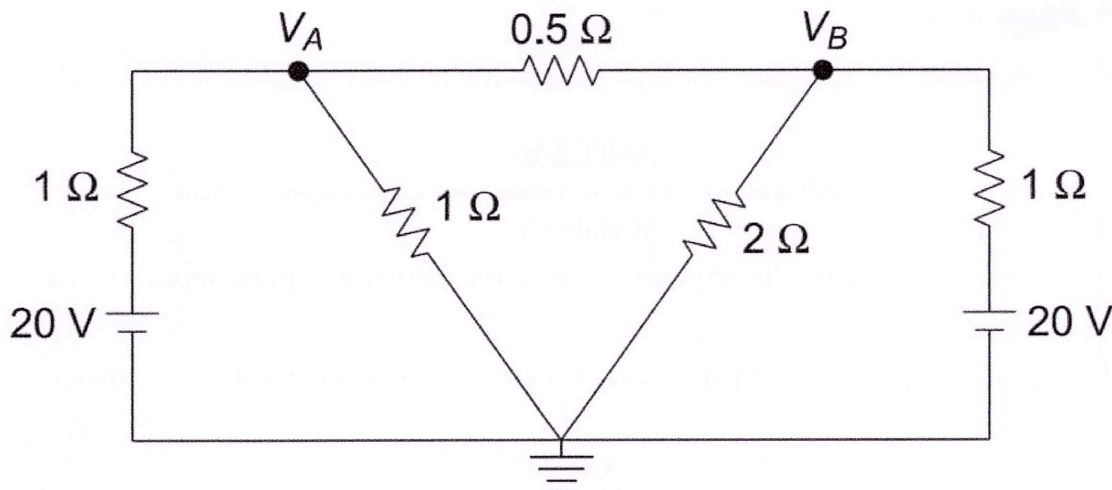
1. A delta network consists of three equal resistors of 2Ω each. Find the equivalent star resistances. CO2 (3)
2. State and explain Kirchoff's voltage and current laws. CO1 (3)
3. A three-phase motor when connected to a 400 V, 50 Hz supply, draws 5 A, at 0.8 pf lagging. What is the active power consumed by the motor? CO3 (3)
4. Define the terms self-inductance, mutual inductance, and coefficient of coupling. CO1 (3)

PART 1-B

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

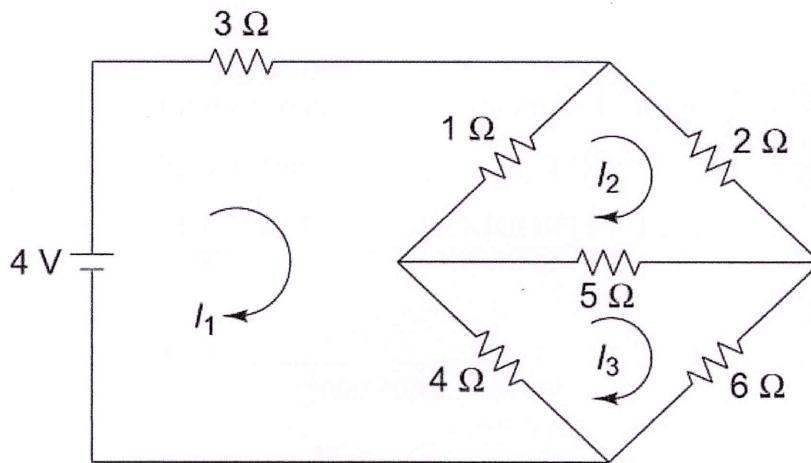
Module - 1

5. Calculate the current through 2Ω resistor for the network shown in figure by using nodal analysis. CO2 (9)



OR

6. Find the value of current supplied by the battery. CO2 (9)



Module - 2

7. A balanced Y-connected load of $8 + j6 \Omega$ per phase is connected to a three-phase 400 V supply. Find the line current, power factor, active power, apparent power and reactive power. CO3 (9)

OR

8. A series RLC circuit with $R = 5\Omega$, $L = 0.1\text{H}$ and $C = 5\text{mF}$ is supplied from a 100V, 10Hz supply. Find the impedance, power factor, current drawn from the supply, active power, reactive power and apparent power. CO3 (9)

PART 2: ELECTRONICS ENGINEERING (30 Marks)

PART 2-A

Answer All Questions. Each question carries 3 marks

9. Why does the depletion region of a PN junction widen with an increase in reverse bias? CO4 (3)
10. Draw the symbols of a regular diode and a Zener diode. Mention any two differences between them. CO4 (3)
11. What are Lissajous patterns? CO5 (3)
12. What is the role of the RF amplifier in a superheterodyne receiver? Explain briefly. CO5 (3)

PART 2-B

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

Module - 3

13. a) With a neat waveform, explain the response of collector current to a pulse input when a transistor is used as a switch. CO4 (5)
- b) Draw the circuit diagram and explain how Zener diode can be used as a voltage regulator. CO4 (4)

OR

14. a) With necessary circuit diagram and waveforms, explain the working of a Full wave bridge rectifier. CO4 (5)
- b) Calculate the resistance value with tolerance, and determine the minimum and maximum values, for the colour bands: Yellow, Violet, Brown, Silver. CO4 (4)

Module - 4

15. a) Draw and explain the block diagram of a Digital Multimeter (DMM). CO5 (5)

b) Explain the term 'modulation index' in a radio communication system. An AM modulated carrier wave has maximum and minimum amplitudes of 600 mV and 450 mV respectively. Calculate modulation index. CO5 (4)

OR

16. a) With the help of a neat diagram, describe the concept of Frequency Modulation (FM) and explain how the carrier frequency varies with the modulating signal. CO5 (5)

b) List the applications of IoT in healthcare. CO5 (4)
