



B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Second Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U18EII2201: Foundation in Electrical and Electronics Engineering

COURSE OUTCOMES

- CO1:** Analyse the given DC circuits and AC resonant circuits
CO2: Solve the given networks by applying circuit theorems.
CO3: Explain the characteristics and applications of various electronic devices.
CO4: Illustrate the concepts of electrical machines and transformers.

Time: Three Hours

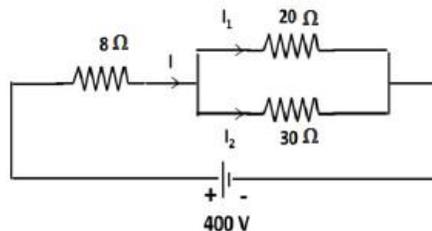
Maximum Marks: 100

Answer all the Questions:-

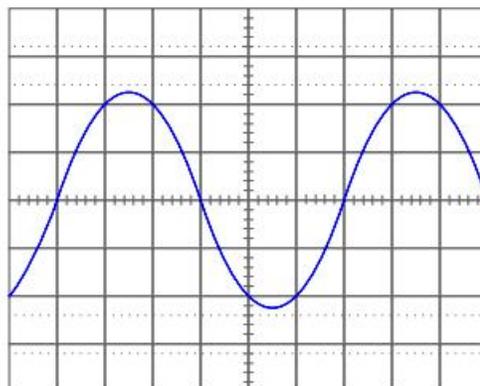
PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

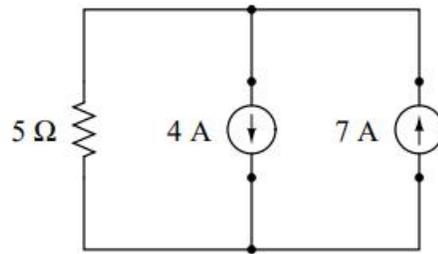
1. An $8\ \Omega$ resistor is connected to a parallel circuit consisting of $20\ \Omega$ and $30\ \Omega$ resistors as shown in the diagram. If $400\ \text{V}$ is applied to this circuit combination, determine the current through the $20\ \Omega$ resistor. CO1 [K₃]



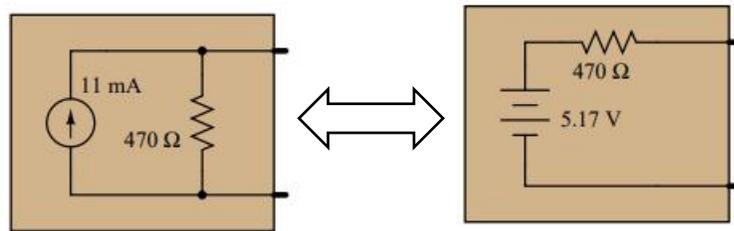
2. Determine the RMS amplitude of the sinusoidal waveform shown below, as displayed by an oscilloscope with a vertical sensitivity of $0.2\ \text{Volts per division}$. CO1 [K₃]



3. How will you perform Δ to Y transformation? Illustrate with an example. CO1 [K₂]
4. Apply superposition theorem to find the current through 5 Ω resistor. CO2 [K₃]



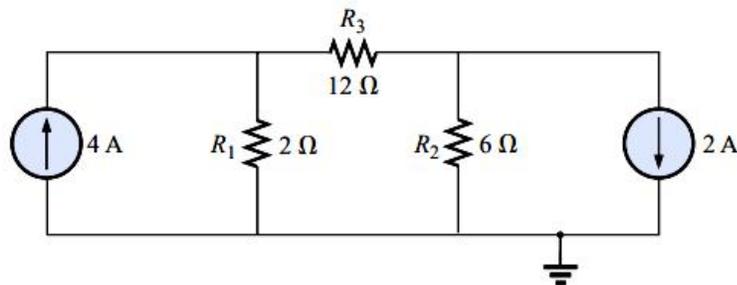
5. The following circuits are ideal. State True or False. Justify your answer. CO2 [K₃]



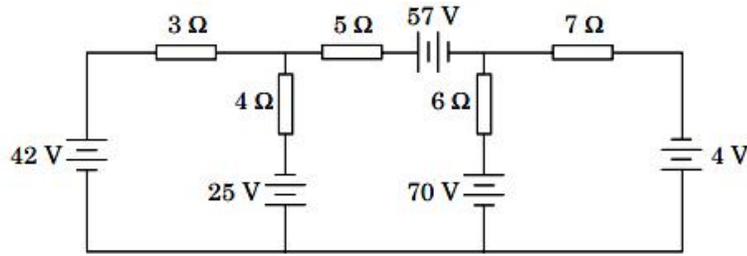
6. For maximum power transfer, the impedance of the speakers connected to an audio power amplifier should be _____ . CO2 [K₂]
7. What is knee voltage in a PN junction diode? State its value for silicon and germanium diodes. CO3 [K₁]
8. Compare LED and LCD. CO3 [K₁]
9. Single phase induction motors are not self-starting. Why? CO4 [K₂]
10. Mention the applications of DC shunt and DC series motors. CO4 [K₁]

**Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)**

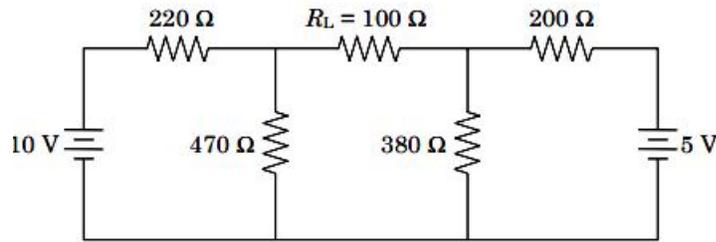
11. Determine the nodal voltages for the circuit shown below: 16 CO1 [K₃]



12. Find the current in 4 Ω resistor in the circuit shown below: 16 CO1 [K₃]



13. Obtain the Norton's model and hence find the current through $100\ \Omega$ load resistance in the circuit shown below: 16 CO2 [K₃]



14. a) Explain the input and output characteristics of a transistor operating in CB configuration with neat circuit diagram. 8 CO3 [K₂]
 b) Draw the V-I characteristics of SCR and explain the four operating modes with the aid of an application. 8 CO3 [K₂]
15. a) Compare PN Junction diode and zener diode. 8 CO3 [K₂]
 b) Describe the working principle of JFET with neat diagrams. 8 CO3 [K₂]
16. a) Derive the emf equation of a DC generator. 8 CO4 [K₂]
 b) Describe the construction and working of a three-phase induction motor with neat diagrams. 8 CO4 [K₂]