

# 22310

**11920**

**3 Hours / 70 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answers with neat sketches wherever necessary.  
(4) Figures to the right indicate full marks.  
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

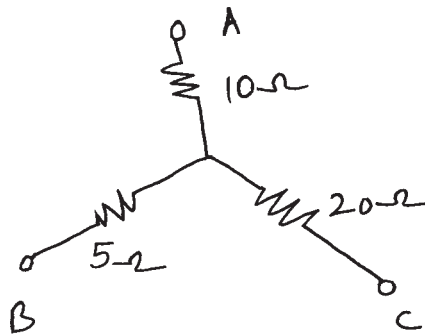
**SECTION - I**

- 1. Attempt any SIX of the following:** **12**
- Define self induced Emf. Write equation of self induced Emf.
  - State Lenz's Law.
  - Draw sinusoidal waveform showing various quantities associated with it.
  - Define RMS value and Average value of AC waveform.
  - State applications of single phase AC motors.
  - Write the Emf equation of transformer. State the meaning of each term in it.
  - Define -
    - Current
    - Potential difference
  - State Faradays laws of electromagnetic inductions.

P.T.O.

**2. Attempt any THREE of the following:****12**

- Draw and explain B-H curve.
- Obtain the delta connected equivalent for the star connected circuit (Fig. No. 1)

**Fig. No. 1**

- Draw and describe power triangle. State its significance.
- Compare magnetic and electric circuits (four points)
- Describe the construction and working principle of auto transformer.

**3. Attempt any TWO of the following:****12**

- Describe the operation of inductor with a sinusoidal AC voltage as input. Draw waveform for voltage across and current through the inductor. Draw its phasor representation.
- Describe the construction and working principle of single phase AC motor.
- State the different types of transformers. Describe the construction and general principle of transformer.

**SECTION - II**

- 4. Attempt any FIVE of the following: 10**
- a) Define active component. Give two examples.
  - b) State any four specifications of resistor.
  - c) Draw symbol of -
    - (i) PN junction diode
    - (ii) Zener diode
  - d) State the need for filter circuits in power supply.
  - e) Define  $\alpha$ . Give the relationship between  $\alpha$  and  $\beta$ .
  - f) Define the following with respect to BJT.
    - (i) Input resistance
    - (ii) Output resistance
  - g) Compare between active and passive components.
- 5. Attempt any THREE of the following: 12**
- a) Describe the operation of transistor as a switch with suitable diagram.
  - b) Draw and explain the operation of zener as a voltage regulator.
  - c) Define filter. State its types. Draw any one filter with input and output waveform.
  - d) (i) Draw the time domain and frequency domain representation of sine wave and triangular wave.
    - (ii) Define frequency and wavelength
  - e) (i) Discuss ideal and practical voltage source.
    - (ii) Compare CB, CC and CE configuration (two points)

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**Marks**

**6. Attempt any TWO of the following:**

**12**

- a) (i) Compare between analog and digital IC.
  - (ii) Find the value of resistor from the given color code.
    - (1) Brown, Black, Red, Silver
    - (2) Orange, Red, Brown, Gold
  - b) Draw circuit diagram and describe the working principle of full wave bridge rectifier. Draw it's waveforms.
  - c) Draw construction of BJT (NPN) and explain its working principle. State and explain the different operating regions.
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