

Seat
No.

--	--	--	--	--	--



AOI1319

Elements of Electrical Engineering (Old) (1120)

P. Pages : 2

Time : Two Hours

Max. Marks : 50

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Figures to the right indicate full marks.
5. Use of non-programmable calculator is allowed.
6. Assume suitable additional data if necessary.
7. Neat diagrams must be drawn wherever necessary.

UNIT - I

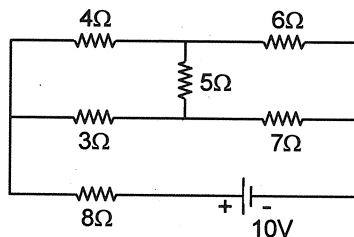
1. Attempt any two.

a) Derive star to Delta transformation.

5

b) Calculate the current in 5Ω Resistor in the ckt. shown using Kirchhoff's Laws.

5



c) The resistance of the field coils of a dynamo is 173Ω at 16°C . After working for 6 hours on full Load, the resistance of the coil increases to 212Ω , calculate the mean temp. rise of field coils. Assume $\alpha_0 = 0.00426/^\circ\text{C}$.

5

UNIT - II

2. Attempt any two.

a) Define magnetic circuit and hence derive the Ohm's Law for magnetic circuit. Also define mmf and Reluctance.

5

b) An iron ring of cross - sectional area 6 cm^2 is wound with a wire of 100 turns and has a saw cut of 2mm. Calculate the magnetising current required to produce a magnetic flux of 0.1 mwb if mean length of magnetic path is 30cm and relative permeability of iron is 470.

5

- c) Compare Electric and magnetic circuit with respect to their similarities and dissimilarities. 5

UNIT - III

3. Attempt any two.

- a) Derive the following relations for an alternating quantities. 5
 i) Average value. ii) Form factor. iii) Peak factor.
- b) The following four currents are fed into a common conductor. 5
 $i_1 = 50 \sin wt$; $i_3 = 40 \cos wt$
 $i_2 = 25 \sin (wt + \pi/3)$; $i_4 = 30 \sin (wt - \pi/2)$
 find the expression for the resultant in the form.
 $i = I_m \sin (wt \pm \phi)$
- c) Explain the Generation of $1 - \phi$ Alternating voltage and currents. Also state their different equations. 5

UNIT - IV

4. Attempt any two.

- a) If $V = V_m \sin (wt)$ is applied across pure inductive circuit the derive the corresponding equation of alternating current. also find average power over a cycle & Hence Draw the required current and voltage waveforms & phasor diagram. 5
- b) Draw the voltage triangle, Impedance Triangle, and power triangle for R - L series circuit and define the terms Inductive Reactance and Impedance. 5
- c) Two Impedances $z_1 = (10 + j5) \Omega$ and $z_2 = (8 + j6) \Omega$ are in parallel and connected to a 200 volt, 50Hz supply. Find (i) the supply current (ii) circuit P.F. and (iii) power consumed by the circuit.

UNIT - V

5. Attempt any two.

- a) What is Earthing ? State it's type and explain pipe Earthing with neat sketch. Also state the Factors on which Earth Resistance depends. 5
- b) Define the term fuse ? State their types and explain with neat diagram the H.R.C. fuse. 5
- c) Draw the wiring diagram of Fluorescent Tube and Explain it's operation. 5
