22232

11819

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

SECTION - I

Marks

1. Attempt any SIX of the following : **12**

(a) Define EMF and state its unit.

(b) Define (i) Permeability (ii) Reluctance

(c) Write the relation between RMS value and Average value.

(d) State the working principle of transformer.

(e) The frequency of an a.c. quantity is 60 Hz. Find the time period.

(f) Define FHP motor and list various types.

(g) Define transformation ratio of a transformer.

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

(a) Compare electric circuits and magnetic circuits on the basis of (i) Definition (ii) Diagram (iii) Analogy (iv) Dissimilarities

(b) Explain the working of auto-transformer and state any two advantages of it.

(c) Write the voltage & current equations, and draw the circuit, voltage & current waveforms and phasor diagram of a R-C series circuit when it is connected across AC supply.

(d) Derive the EMF equation of a transformer.

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

(a) A sinusoidal current is given by i = 15 sin (520t – 45°) Determine its (i) Amplitude (ii) RMS value (iii) Average value (iv) Frequency (v) Time period (vi) Phase

(b) Explain statically induced EMF and Dynamically induced EMF with neat diagrams.

(c) A 1 KVA, 2000/200 V, 50 Hz single phase transformer has maximum flux of 20 mWb. Find (i) Number of turns in primary (ii) Number of turns in secondary (iii) Primary full load current (iv) Secondary full load current.

SECTION - II

4. Attempt any FIVE of the following : **10**

(a) List different types of resistors and capacitors.

(b) Draw the circuit symbol of ideal current source and practical voltage source.

(c) Define filter and state it's types.

(d) Draw the block diagram of regulated power supply.

(e) State the applications of BJT.

(f) Draw the output characteristics of BJT in CE configuration and label various regions on it.

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

(a) Find the resistor value from the given colour code :-

(i) Orange, Red, Brown, Silver

(ii) Red, Black, Yellow, Gold

(b) Compare CE, CB and CC configurations of a transistor.

(c) Explain the construction of LED and state its principle of operation.

(d) List any 4 advantages and any 4 disadvantages of Integrated circuits.

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

(a) Explain the operation of a full wave bridge rectifier with π filter using a neat diagram. Draw input and output waveforms.

(b) (i) Derive the relation between alpha (α) and beta (β).

(ii) Compare PN junction diode with zener diode.

(c) Explain the operation of transistor as a switch and as an amplifier, with neat circuit diagrams.

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