22208

12425

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

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) Assume suitable data, if necessary.

Marks

SECTION – I

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

(a) Define power and energy.

(b) State Faraday's law of electromagnetic induction.

(c) Define power factor and write mathematical formula for it.

(d) A current wave is expressed by an equation i = 6 sin628t. Find the RMS value of current.

(e) Define transformation ratio of transformer.

(f) State the difference between step up and step down transformer.

(g) List the various losses that occur in a transformer.

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

(a) Compare statically and dynamically induced emf on the basis of

(i) Movement of coil or magnet

(ii) Current through electromagnet

(iii) Expression for induced voltage

(iv) Applications

(b) Draw a balanced 3-phase delta connected load. Show various line and phase quantities on it. Also write relationship between line and phase values of voltage and currents.

(c) Explain the working principle of single phase transformer.

(d) (i) Define FHP motor.

(ii) Give the classification of single phase induction motor.

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

(a) Draw and explain B-H curve.

(b) A sinusoidal voltage with equation V = 70.7 sin 314 t volt is applied to a load. Calculate :

(i) Maximum voltage

(ii) RMS voltage

(iii) Frequency

(iv) Average voltage

(v) Form factor

(vi) Peak factor

(c) A 1-phase, 1 KVA, 230/115 V transformer is used in a laboratory. Calculate :

(i) Primary winding current

(ii) Secondary winding current

(iii) Turns ratio

(iv) Current ratio

SECTION – II

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

(a) List different types of resistors.

(b) Compare analog and digital IC's.

(c) Draw symbol and state one application of Zener diode.

(d) State application of light emitting diode. (any two)

(e) Draw the symbol of PNP and NPN transistor.

(f) List different transistor configuration.

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

(a) Find the resistor value from the given colour code.

(i) Red, Blue, Yellow, Gold

(ii) Brown, Black, Brown, Gold

(b) Explain working principle of light emitting diode.

(c) Draw and explain V-I characteristics of P-N junction diode.

(d) Explain transistor as switch.

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

(a) Explain ideal and practical current source with suitable diagram.

(b) Compare half wave rectifier and full wave bridge rectifier on the basis of

(i) Number of diodes used

(ii) PIV

(iii) Circuit diagram

(iv) Ripple factor

(v) Efficiency

(vi) Output frequency

(c) Draw the output characteristics of CE configuration and explain Cut-off, Saturation and Active region.