Seat
No.

Subject : Basic Electrical Engineering   Code : 59178 & 59934

First Year Engineering - SEM. – I and II

(New Syllabus : Introduced from July 2013)

Day and Date : Wednesday, 21-05-2014   Time : 10 a.m. to 1.00 p.m.

Total Marks: 100

Note: 1) All questions are compulsory

2) Assume suitable data wherever necessary

3) Figures to right indicate full marks

SECTION - I

Q.1. Answer any Two

a) Explain B-H curves for magnetic and non-magnetic materials.   08

b) An iron ring having mean length of iron path of 90cm is having air gap
1 mm wide. It is wound with coil having 1200 turns. Flux density of
1 Wb/sq. m is to be produced in air gap. Assuming relative permeability
of iron to be 1100 and neglecting leakage & fringing, calculate
current required to be sent through the coil.   08

c) Define the terms and state their units   08

1) potential difference,   2) Current,

3) power,   4) resistivity

Q.2. Answer any Two

a) Explain with neat diagram how sinusoidal voltage is induced in a coil
if it is rotated at constant angular velocity in uniform magnetic field.   02

b) A coil connected across 150 V, 50 Hz, 1 phase ac supply has power factor
of 0.8 lagging and dissipates 60 W in it. Calculate resistance and inductance
of the coil.   08

c) Define R.M.S. value? Derive expression for RMS value of alternating
current having sine waveform.   08

Q.3. Answer any Two

a) Explain construction & working of Compact fluorescent lamp (CFL).
Also state its advantages and disadvantages.   09

b) Why earthing is essential for electrical installations? Explain any one
method of earthing.   09

c) Describe construction and working of LED lamp. Also state its advantages
& disadvantages.   09

SECTION - II

Q. 4. Answer any TWO.

a) Why are the three phases of 3- Φ alternator are interconnected ? Briefly explain star & delta connections.
08

b) Explain why three phase systems have been adopted throughout the world. Find the relation between line value & phase value in case of a star connected load. Draw relevant connection diagram & phasor diagram.
08

c) Explain the different losses taking place in the transformer. Where do they occur? How can they be reduced?
08

Q. 5. Answer any TWO.

a) State the principle on which transformer works. Describe with a neat sketch constructional features of the core type transformer & the shell type transformer.
08

b) The primary winding of a single phase transformer is connected to a 230 V, 50 Hz supply. The secondary winding has 1500 turns. If the maximum value of core flux is 2.07 mWb, determine,

(i) The number of turns on the primary winding.

(ii) The secondary induced voltage.

(iii) The net cross sectional area if the flux density has a maximum value of 0.465 Tesla.
08

c)   (i) Define voltage regulation and All day efficiency of a transformer.
04

(ii) Explain working of a transformer on no load. Draw the phasor diagram.
04

Q. 6. Answer any TWO.

a) Describe with a neat sketch constructional features of the salient pole type alternator & non salient pole type alternator. Explain why the terminal voltage of an alternator falls with increase in load.
09

b) Discuss why single phase induction motors do not have a starting torque. Explain construction & working of Resistance split phase induction motor. How is the direction of rotation is reversed
09

c) Describe the construction & working of Universal motor. Comment briefly on Speed-Torque characteristics mention its applications.
09