Seat No. 46942

S - 1453

SHIVAJI UNIVERSITY, KOLHAPUR

Subject : Basic Electrical Engineering **Code : 59178**

First Year Enginerring - Sem - I (New Course)

Day and Date : Monday 23-12-2013 Time : 10.00 a.m. to 01.00 p.m.

Total Marks : 100

Note: 1) All questions are compulsory.

2) Assume suitable data wherever necessary.

3) Figures to the right indicate full marks.

SECTION - I

Q.1. Answer any TWO

a) Make comparison between Electric & Magnetic Circuits. 08

b) A crane motor lifts 2000 kg through 10 meters in 15 seconds. Find the current & energy input when supply voltage is 400 V d.c. and overall efficiency is 50 % 08

c) A flux density of 1.2 Wb/m^2 is required in the 2 mm air gap of an electromagnet having an iron path 1 m long. Calculate the magnetizing force & current required if the electromagnet has 1273 turns. Assume relative permeability of iron to be 1500 08

Q.2. Answer any TWO

a) What is power factor? Discuss the practical importance of power factor & how power factor can be improved using static capacitor. 08

b) Determine phase angle relationship between alternating voltage & current in a purely capacitive circuit & also prove that average power consumed in the circuit is zero. 08

c) A voltage of 125 V at 50 Hz is applied across a resistor connected in series with a capacitor. The current in the circuit is 2.5 Amps. The power loss in the resistor is 96.8 Watt. Calculate the resistance & capacitance. 08

Q.3. Answer any TWO

a) Draw single line diagram of a typical power system and explain the stages involved in transmission of electrical power from generating station to consumer's premises. 09

b) Explain construction & working of mercury vapour lamp. Also state its advantages, disadvantages & applications. 09

c) Why earthing is necessary in a wiring installation? Briefly explain any one method of earthing. 09

P.T.O.

SECTION – II

Q.4. Answer any TWO

a) What are the advantages of three phase system over single phase system? Also define

1. Balanced system 2. Phase sequence 08

b) Briefly describe an elementary three phase alternator and explain how it generates three phase supply. Why are the three phases of the armature of an alternator interconnected? 08

c) Obtain the relationship between the line voltage and line current with phase voltage & phase current in star connected circuits. 08

Q.5. Answer any TWO

a) Describe the construction of single phase alternator. Why the terminal voltage of an alternator decreases with increase in load? 08

b) Define – Efficiency & voltage regulation of a transformer. Briefly explain direct loading method for finding efficiency & voltage regulation. Why this test is normally conducted in case of small transformers only? 08

c) A 200 KVA, 3300/240 volts, 50 Hz single phase transformer has 80 turns on secondary winding. Calculate - 08

1. Primary & secondary currents on full load
2. The number of primary turns
3. The maximum value of flux

Q.6. Answer any TWO

a) Explain that basically a single phase induction motor is not a self starting motor. How will you make a single phase induction motor self starting? 08

b) Describe the construction & working of a single phase shaded pole motor. Also write its applications. 09

c) Describe the construction & working of a capacitor-start capacitor-run single phase induction motor. What are its advantages & practical applications? 09