Code No. : 5240/O

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) II Semester (Old) Examination, May/June 2012

ELECTRICAL CIRCUITS AND MACHINES

Time : 3 Hours] [Max. Marks : 75

***Note** : Answer **all** questions from Part – **A**. Answer **any five** questions from Part – **B**.*

PART – A **(25 Marks)**

1. Explain mutual inductance. **2**

2. Explain rms value and average value of an alternating quantity. **3**

3. A balanced star-connected load of (8+j6) Ω per phase is connected to a 3-phase, 230 V, 50 Hz supply. Find the line current. **3**

4. Draw the phasor diagram of a transformer on no-load. **2**

5. Classify various types of dc generators based on excitation. **2**

6. Draw the characteristics of series motors. **3**

7. List various methods of starting the induction motors. **2**

8. Draw the slip-torque characteristic of an induction motor. **3**

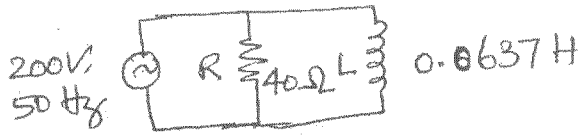
9. How are the AC 1-ϕ motors made self starting ? **2**

10. What are the basic features of stepper motor ? **3**

PART – B (50 Marks)

11. a) An alternating voltage is given by v = 141.4 sin 314 t find i) frequency (ii) rms value (iii) average value (iv) instantaneous value. 4

b) Determine the real and reactive power consumed by the circuit given below. 6



12. a) Explain the measurement of 3ϕ power by using two wattmeter method. 5

b) A 40 kVA single phase step down transformer has a full load secondary current of 200 A and the total resistance referred to secondary is 0.008 Ω. Find the efficiency of the transformer at full load and unity power factor. 5

13. Describe the construction and working principle of a dc machine and explain how emf is produced in a generator. 10

14. a) Explain the production of rotating magnetic field. 5

b) Explain any one method of speed control of induction motor. 5

15. Explain the operation of capacitor start capacitor run single phase induction motor. 10

16. A 4 kVA, 400/200 V, 50 Hz, single phase transformer has the following test data.

OC test : 200 V, 2A, 90 W.

SC test : 20 V, 10A, 100 W.

Find the equivalent circuit referred to high voltage side. 10

17. Write a short notes on the following :

a) Autotransformer 3

b) Energy stored in capacitor 3

c) Application of DC motors. 4