Code No. 2270

FACULTY OF ENGINEERING & INFORMATICS

B.E. 2/4 (MP / IT) I – Semester (Main) Examination, Nov./Dec. 2012

Subject: 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 the difference between self inductance and mutual inductance. (3)
2. Derive an expression for energy stored in an inductor. (3)
3. Explain the principle of operation of 2 winding transformer. (2)
4. Define regulation and efficiency of a transformer. (3)
5. What do you understand by open circuit characteristics, internal characteristics and external characteristics of a d.c. generator? (3)
6. Write the applications of D.C. shunt motor. (2)
7. Why starter is required for a 3 phase induction motor? (2)
8. Define slip. What is the value of slip when the induction motor is at standstill? (3)
9. Define voltage regulation for an alternator. (2)
10. Write the applications of capacitor-start induction motor. (2)

PART – B (50 Marks)

11.(a) Two coils with terminals T_1, T_2 and T_3, T_4 respectively are placed side by side. Measured separately, the inductance of the first is 1200μH and that of the second coil is 800μH. With T_2 joined with T_3, the total inductance between the two coils is 2500μH. What is the mutual inductance? (5)

(b) Show that the average power drawn by a capacitive circuit is zero. (5)

12. Explain the method of measurement of power in 3 phase circuits by using two wattmeters by drawing the phase diagram. Also derive the expression for tanθ. (10)

13.(a) Draw and explain the significance of equivalent circuit of a transformer. (5)

(b) Describe the procedure for conducting open circuit test on a transformer. What parameters are calculated from the test? (5)

14.(a) Explain the working of a 3 point starter. (5)

(b) Explain the speed control of D.C. motor by armature resistance control method. (5)

15. Explain the operation of star-delta starter by drawing the neat diagram. Also derive the necessary equations. (10)

16.(a) Explain the constructional details and principle of operation of a capacitor run induction motor. (5)

(b) Explain the constructional details of an alternator. (5)

17. Write a short notes on. (10)
(a) Regulation of alternator by synchronous impedance method
(b) Stepper motor.

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