



Code No. : 6213

**FACULTY OF ENGINEERING**  
**B.E. 2/4 (CSE) II Semester (Main) Examination, June 2010**  
**ELECTRICAL CIRCUITS AND MACHINES**

Time: 3 Hours]

[Max. Marks : 75

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

**PART – A**

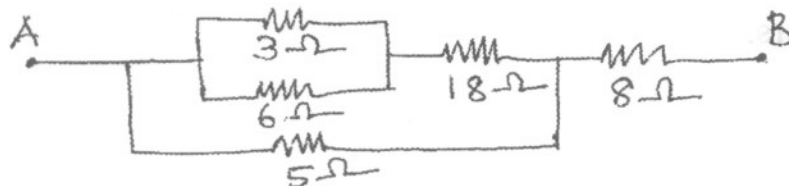
**(25 Marks)**

1. Define r.m.s. and average value. 3
2. Define active power. 2
3. What is the relationship between line and phase currents in a balanced delta connected system ? 2
4. Explain the principle of operation of Auto transformer. 3
5. Draw the speed-torque, torque-armature current characteristics of a D.C. series motor. 3
6. List out the types of excitation employed for d.c. motors. 2
7. Draw the speed torque characteristic curve of a squirrel cage induction motor. 3
8. What is slip ? 2
9. What are the basic features of Brush less D.C. motor. 3
10. Write the methods of starting single phase motor. 2

**PART – B**

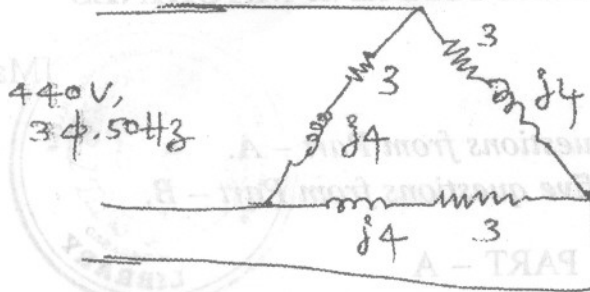
**(50 Marks)**

11. Calculate the effective resistance of the following combination of resistances and the voltage drop across each resistance when a potential difference of 60 V is applied between points A and B as shown in figure below :



10

12. a) In the circuit given below obtain line and phase voltages and currents. 5



- b) Derive expression for energy stored in a capacitor. 5
13. A 50 KVA, 6600/220 V transformer has a primary resistance of  $10 \Omega$  and a secondary resistance of  $0.01 \Omega$ . Find
- Total resistance referred to secondary side
  - Full load copper loss
  - Efficiency of transformer at full load and u.p.f. if copper losses equals core losses at this load. 10
14. a) Explain the principle of operation of a d.c. generator. 5
- b) Discuss the various methods of speed control of a d.c. motor. 5
15. Explain the principle and operation of 3- $\phi$  induction motor. 10
16. Explain the principle and operation of a stepper motor. 10
17. Write a short notes on the following:
- Regulation of a transformer 3
  - Thevenin's theorem 3
  - D.C. compound motors. 4

