

# FACULTY OF INFORMATICS

B. E. 2/4 (IT) I Semester (OLD) Examination, July 2012

Subject: **Electrical Engineering**

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. State and explain the Kirchhoff's current-law. 3
2. Define the average and RMS value of sinusoidal ac quantities. 2
3. List out the advantages of autotransformers. 3
4. List out the advantages of three phase systems. 2
5. Classify the DC machines. 2
6. Explain why do we use a starter to start the DC motor. 3
7. Compare the cage and wound rotors. 2
8. What is meant by slip in an induction motor? Why must slip be present for motor action? 3
9. Explain the principle of operation of a three phase alternator. 3
10. Explain the basic principle of operation of a single phase motor. 2

## PART – B (50 Marks)

- 11.(a) State and explain the Thevenin's theorem and Norton theorem with suitable examples. 5
- (b) Derive the expression for the energy stored in an inductance and capacitance. 5
- 12.(a) Explain the working principle of single phase energy meter with necessary diagrams. 5
- (b) Explain OC and SC tests of single phase transformer with neat diagrams. 5
- 13.(a) Derive the e.m.f equation of D.C. generator. 4
- (b) Discuss the different methods of speed control of d.c motor. 6
- 14.(a) Explain the control of speed of a three phase induction motor by
  - (i) Stator voltage method
  - (ii) Rotor resistance method
- (b) A 4-pole, three phase induction motor operates from a supply whose frequency is 50 Hz. Calculate (a) the speed at which the magnetic field of the stator is rotating; (b) the speed of the rotor when the slip is 0.04; (c) the frequency of the rotor current when the slip is 0.03; (d) the frequency of the rotor current at standstill. 4
- 15.(a) What is meant by armature reaction in an alternator? Explain. 4
- (b) With neat diagrams explain the regulation of three phase alternator by synchronous impedance method. 6
- 16.(a) Explain the principle of operation of a single phase capacitor start and capacitor run motor with neat diagrams. 6
- (b) Derive the torque equation for DC motor. 4
17. Write short notes on the following: 10