Code No. : 3276

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I Semester (Main) Examination, December 2010

ELECTRICAL TECHNOLOGY

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. Write the principle of operation of dc generator. **3**
2. Define regulation of ac generator. **3**
3. Draw the Torque-Speed characteristics of dc shunt motor. **3**
4. Why high voltage transmission is more advantageous than low voltage transmission ? **3**
5. What is meant by synchronous impedance of an alternator ? **3**
6. What is the purpose of commutator in a d.c machine ? **2**
7. Give the relationship between phase and line quantities of voltage and current for a delta connected 3-phase system. **2**
8. Define efficiency and regulation of transformer. **2**
9. Write the applications of a shaded pole motor. **2**
10. What are the different non-conventional generating systems available in India ? **2**

PART – B **(50 Marks)**

11. a) Explain the process of commutation in a DC generator. **5**

    b) Describe with neat sketch the construction of a DC machine. **5**

12. a) The armature of a 4 pole DC motor has a lap connected winding accommodated in 60 slots, each containing 20 conductors. If the useful flux per pole is 25 mWb, calculate the torque developed when the armature current is 60 A. **5**

    b) Discuss various methods of speed control, applicable to DC series motor. **5**

13. a) With a neat diagram explain the construction and principle of operation of 3-ph Induction motor. 5

    b) A balanced star connected load of $(8 - j4)\ \Omega$/phase is connected to a $3-\phi$, 400V, 50Hz supply. Find the line current, power factor and power. 5

14. a) Explain how the efficiency of a transformer may be estimated from the open circuit and short circuit tests. 5

    b) Discuss the principle of operation and applications of single phase auto transformer. 5

15. a) Derive the torque-slip equation for a $3-\phi$ induction motor and also the equation for slip at which maximum torque occurs. 5

    b) Explain the constructional features and principle of operation of a capacitor start and run single phase induction motor. 5

16. Describe with a neat sketch, the operation of Nuclear Power Plant. 10

17. a) Using double revolving field theory, explain why a single phase induction motor is not self-starting 5

    b) Show that the maximum efficiency in a transformer occurs when its variable loss is equal to constant loss. 5