Code No. 2330 / N

FACULTY OF ENGINEERING

B.E. 3/4 (EEE) I – Semester (New) (Main) Examination, Nov. / Dec. 2012

Subject : Electrical Machinery – II

Time : 3 hours **Max. Marks : 75**

***Note**: Answer all questions from Part–A and answer any **FIVE** questions from Part–B.*

PART – A (25 Marks)

1. What are the conditions should be fulfilled for successful parallel operation of 1-phase transformers? (3)
2. How No-load current measured for the 1-phase transformer. (2)
3. Draw delta / delta connection diagram and phasor diagram for a 3-phase transformers. (3)
4. What are the applications of auto-transformers? (2)
5. Differentiate squired cage and wound rotors of a 3-phase induction motors. (2)
6. Draw slip-torque characteristics of 3-phase induction motor showing braking, motoring and generation modes. (3)
7. Mention various methods of speed control of 3-phase induction motors. (2)
8. What are the advantages and disadvantages of double cage rotor? (3)
9. What are the effects of 3-phase transformer when one phase voltage is low? (3)
10. What do you understand by voltage unbalanced in 3-phase induction motor? (2)

PART – B (50 Marks)

11. Explain the working principle of the following with neat schematic diagrams.
    a) Single phasing of 3-phase induction motor
    b) Single phase load on 3-phase transforms (10)

12. A 600 KVA, 1-phase transformer with 0.012 p.u. resistance and 0.06 p.u. reactance is connected in parallel with a 300 KVA transformer with 0.014 p.u.resistance and 0.045 p.u. reactance to share a load of 800 KVA at 0.08 p.f. logging. Find how they share the load a) When both the secondary voltages are 440V b) When the open circuit secondary voltages are 445V and 455V respectively. (10)

13. a) Explain about principle of operation of auto-transformer with neat schematic diagram. (5)
    b) Explain no-load tap changer with neat schematic diagram. (5)

14. Two single-phase furnaces X and Y are supplied at 100V by means of a scott-connected transformer combination from a 3-phase 6600V system. The voltageof furnace X is loading. Calculate the line current on the 3-phase side, when the furnace X takes 400 KW at 0.7 p.f. lagging and Y takes 800 K.W. at 0.99 p.f. Also draw the vector diagram. (10)

15. A 3-phase induction motor has a starting torque of 100% and a maximum torque of 200% of the full-load torque. Calculate :
    a) slip at maximum torque
    b) full load slip
    c) rotor current at starting in p.u. of full load rotor current. (10)

16. a) Explain Torque-slip characteristics of an 3-phase induction motor. Indicate the region when the characteristic is mainly liner. (5)
    b) Show that the maximum torque occurs at a slip $s = \frac{x_2}{R_2}$ for an 3-phase induction motor. Further show that maximum torque is independent of slip. (5)

17. a) Explain Kramer drive with neat schematic diagram. (5)
    b) Explain about operation of an induction generator. (5)

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