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Code No. : 31202

VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD
B.E. (E.E.E.) III Year I-Semester (Main) Examinations, Nov./Dec.-2016

Electrical Machinery-II

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

1. What is the effect of unequal X/R ratio in the parallel operation of 1-phase transformer?
2. What are the conditions to be fulfilled for parallel operation of 1-phase transformers?
3. List the applications of 3-phase to 2-phase conversion.
4. Give the significance of tertiary winding in three-winding transformer.
5. What is the impact on the operation of 3-ph Induction Motor when any two phases are interchanged?
6. Draw the performance characteristics of 3-phase Induction motor.
7. What are the speed control methods of 3-phase Induction Motor?
8. List the applications of 3-phase Induction Generator.
9. What do you mean by single phasing in case of 3-phase transformer?
10. List the merits of star/delta transformers.

Part-B (5 × 10 = 50 Marks)

11. a) Explain briefly the various cooling methods of transformers. [5]
b) A 600kVA 1-phase transformer with 0.012p.u resistance and 0.06p.u reactance is connected in parallel with a 300kVA transformer with 0.014p.u resistance and 0.045p.u reactance to share a load of 800kVA at 0.8p.f lagging. Find how they share the load if both the secondary voltages are 440V. [5]
12. a) Explain the constructional details of a 3-phase transformer. [5]
b) Two 1-phase furnaces X and Y are supplied at 100V by means of a Scott-connected transformer from a 3-phase 6600V system. The voltage of furnace X is leading. Calculate the line current on the 3-phase side, when the furnace X takes 400kW unity p.f and Y takes 800kW at 0.8p.f lagging. [5]
13. a) Explain the procedure of conducting no-load and blocked rotor tests on 3-phase Induction motor. [5]
b) A 3-phase, 400V, 50Hz Induction motor takes a power input of 35kW at its full-load speed of 980r.p.m. The total stator losses are 1kW and the friction and windage losses are 1.5kW. Calculate
i) slip
ii) rotor ohmic losses
iii) efficienc [5]
14. a) Explain the constant output power Kramer drive with neat schematic diagram. [5]
b) Discuss in detail about the different starting methods of 3-phase induction motor. [5]

- 15. a) Explain single-phasing in 3-phase Induction motor. [3]
- b) A Delta-Star, 6.6/0.4kV bank of three identical single-phase transformers supplies a three-phase balanced load of 600kVA at 0.8p.f. lagging and a single-phase load of 80kW at unity p.f. between one line and neutral. Determine the magnitude of currents in each primary phase winding. Mark their values in a relevant circuit diagram. Ignore internal voltage drops and their no-load current. [7]

- 16. a) Describe all types of tests that a transformer should undergo before it is being moved to field for operation. [5]
- b) Draw the physical connection and phasor diagram of Dy_1 and Yd_{11} transformer connections. [5]

- 17. Write short notes on any **two** of the following:
 - a) Power flow diagram of 3-phase Induction motor. [5]
 - b) Double Cage Induction motor. [5]
 - c) Single-phase line to neutral load on bank of three single-phase transformers. [5]

