| Reg.No.: | | | | | | | | | | | | |
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VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

**Question Paper Code: 80026**

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – JAN. 2026
Sixth Semester
Electrical and Electronics Engineering
U23EE407 – ELECTRICAL MACHINES - II
(Regulation 2023)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

| Knowledge Levels (KL) | K1 – Remembering | K3 – Applying | K5 - Evaluating |
|---|---|---|---|
| | K2 – Understanding | K4 – Analyzing | K6 - Creating |

## PART – A

(10 x 2 = 20 Marks)

| Q.No. | Questions | Marks | KL | CO |
|---|---|---|---|---|
| 1. | Name the various methods for predetermining the voltage regulation of 3-phase Alternator. | 2 | K1 | CO1 |
| 2. | Infer the conditions to be satisfied before connecting two alternators in parallel. | 2 | K2 | CO1 |
| 3. | How the synchronous motor can be used as a synchronous condenser? | 2 | K2 | CO2 |
| 4. | Justify synchronous motor is a constant speed motor. | 2 | K3 | CO2 |
| 5. | Why the rotor speed of an induction motor not to be equal to the speed of its rotating magnetic field? | 2 | K1 | CO3 |
| 6. | Interpret the condition at which the torque developed in a 3 phase induction motor is maximum. | 2 | K2 | CO3 |
| 7. | Why the rotor resistance starter cannot be used for squirrel cage induction motor? | 2 | K1 | CO4 |
| 8. | Outline the limitations of Direct On Line (DOL) starter. | 2 | K1 | CO4 |
| 9. | Why the single phase Induction motor is not self-starting? | 2 | K1 | CO5 |
| 10. | Infer any four applications of single phase Induction motors. | 2 | K2 | CO5 |

## PART – B

(5 x 13 = 65 Marks)

| Q.No. | Questions | Marks | KL | CO |
|---|---|---|---|---|
| 11. a) | Explain the EMF method for determining the voltage regulation of 3-phase alternators. | 13 | K2 | CO1 |

(OR)

| | | | | | |
|---|---|---|---|---|---|
| | b) | Explain the construction and principle of operation of 3-phase alternator with neat diagrams. | 13 | K2 | CO1 |
| 12. | a) | Why synchronous motor is not self-starting? Explain the methods of starting of synchronous motor. | (3+10) | K2 | CO2 |
| | | (OR) | | | |
| | b) | Explain the 'V-curves' and 'inverted V- curves' of synchronous motor. | 13 | K2 | CO2 |
| 13. | a) | Explain the procedure for conducting no load test and blocked rotor test on three phase induction motor. | 13 | K2 | CO3 |
| | | (OR) | | | |
| | b) | Explain the constructional details of three phase induction motors with necessary diagram. | 13 | K2 | CO3 |
| 14. | a) | Explain the speed control of induction motor using rotor resistance control. | 13 | K2 | CO4 |
| | | (OR) | | | |
| | b) | Explain the slip power recovery scheme of an induction motor with necessary diagrams. | 13 | K2 | CO4 |
| 15. | a) | Describe the constructional features and the working principle of single phase induction motor. | (6+7) | K2 | CO5 |
| | | (OR) | | | |
| | b) | Write notes about the following:<br>i. Reluctance Motor<br>ii. Universal Motor | (6+7) | K2 | CO5 |

## PART – C

(1 x 15 = 15 Marks)

| Q.No. | | Questions | Marks | KL | CO |
|---|---|---|---|---|---|
| 16. | a) | A 100 kVA, 3000V, 50Hz, 3 phase star connected alternator has effective resistance of 0.2 Ω. The field current of 40 A produces short circuit current of 200 A and open circuit emf of 1040 V (line value). Determine the full load voltage regulation for 0.8 pf lagging and 0.8 pf leading. | 15 | K3 | CO1 |
| | | (OR) | | | |
| | b) | The following test results are obtained from a 3 phase, 6000 kVA, 6600 V star connected, 2 pole, 50 Hz turbo alternator:<br>With a field current of 125 A, the open circuit voltage is 8000 V at the rated speed; with the same field current and rated speed, the short circuit current is 800 A. At rated full load, the resistance drop is 3 per cent. Find the regulation of the alternator on full load and at a power factor of 0.8 lagging. | 15 | K3 | CO1 |