

Question Bank (K-Scheme)

Name of course: A.C. MACHINES PERFORMANCE

Program: EE

Unit Test: II

Subject code: 315333 (ACM)

Semester: V

Chapter 3: Single Phase Induction Motors-(14 M)

4 Marks

1. Explain with necessary diagram, working of Capacitor Start Capacitor Run Induction motor.
2. Describe with neat sketch the working of Shaded Pole Induction Motor.

Chapter 4: Three Phase Synchronous Machines (16 M)

2 Marks

3. Define pitch factor and distribution factor.
4. Calculate the distribution factor for 36 slots, 4 pole, single layer three phase winding.
5. Define voltage regulation of alternator.
6. Define synchronous reactance.
7. State the advantages of short pitched winding.

4 Marks

8. Comparison of Turbo alternator and Hydro alternator in any four points.
9. State any four advantages of rotating field over rotating armature of a three phase alternator.
10. Explain the effect of armature reaction on various power factors of the load on an alternator. Draw suitable waveforms showing the effects of armature flux.
11. Draw the phasor diagram of a loaded alternator when the load is capacitive and also write the equation of no-load induced e.m.f.
12. A 400V, 10 KVA , 3 phase star connected alternator has resistance per phase of 1.0 ohm. Open circuit voltage per phase of 90V is obtained for field current of 1.0 A. For the same field current, short circuit current per phase is 15A. Calculate: i) Synchronous impedance,

- ii) synchronous reactance, iii) open circuit voltage per phase and iv) Regulation while supplying a load current of 15A at 0.8 power factor lag.
13. A 3 phase, 50Hz, 8 pole alternator has star connected winding with 120 slots and 8 conductors per slot. The flux per pole is 0.05 Wb, sinusoidally distributed. Determine the phase and line voltages .assume full pitch coil.
 14. Derive the EMF equation of Alternator. State the meaning of each term used therein.
 15. Derive an expression for distribution factor of winding with neat sketch.
 16. A 3-phase, star connected alternator rated at 1600 kVA ,13500 V; The armature resistance and synchronous reactance are 1.5Ω and 30Ω respectively per phase- calculate percentage voltage regulation for a load of 1280 kW at a power factor: (i) 0.8 leading (ii) unity iii) 0.8 lag
 17. A 3ϕ , star connected synchronous generator driven at 750 rpm is required to generate a line voltage at 440 V, at 50 Hz on open circuit. The stator is wound with 2 slots per pole per phase and each coil has 4 turns. Calculate the useful flux per pole.(assume full pitch coil)
 18. Explain working principle of operation of synchronous motor.
 19. Explain necessity of synchronisation and state the conditions for it.

Chapter 5: Special Purpose Machines (10 M)

2 Marks

20. List the applications of Linear induction motor.
21. List the applications of Universal motor.

4 Marks

22. Draw & explain torque slip characteristics of permanent magnet synchronous motor.
23. Describe the working of synchronous reluctance motor with the help of neat diagram.
24. Draw and explain construction of Permanent magnet stepper motor.
25. Explain the construction of universal motor and draw its torque – speed characteristics.
26. Explain with neat sketch the working principle of Linear induction motor.