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SUBJECT CODE NO:- H-139
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E. (EEP/EE/EEE)
AC Machines
(REVISED)

[Time: Three Hours]

[Max. Marks: 80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and Q.No.6 are compulsory.
 - ii) Attempt from each section, any two questions from remaining questions.
 - iii) Assume suitable data whenever necessary

Section A

- Q.1 Solve any five questions of the following 10
- 1) A 50Hz, 4 pole, 3 phase Induction motor has rotor current of frequency 2 Hz
Determine (i)the slip and (ii) speed of the motor
 - 2) Define the term cogging
 - 3) Mention the type of starters.
 - 4) Why does slip vary with the load?
 - 5) Why the slots on the rotor of an Induction motor are usually skewed.
 - 6) State why the single phase Induction motor do not have the starting torque
 - 7) Mention any two applications of hysteresis motor
 - 8) State different methods of speed control of 3 phase I.M.
- Q.2 a) Explain working of star delta starter for 3 phase induction motor 07
- b) Explain in detail the principal of operation of a single phase capacitor start, and Induction run motor along with phasor diagram 08
- Q.3 a) Explain the method of speed control of 3 phase Induction motor by rotor circuit resistance. 07
- b) 3 phase induction motor having star connected rotor has induced emf of 50v between slip ring 08
at standstill on open circuit. The rotor has a resistance and reactance per phase of 0.5Ω & 4.5Ω respectively find the current per phase and p.f. at starting when (1) The slip ring are short circuited (2) Slip rings are connected to a star connected rheostat of 4Ω per phase.
- Q.4 a) Explain in detail the power flow diagram of induction motor. A 6 pole 50 Hz 3 phase 07
induction.
- b) Motor runs at 960 RPM when the torque on shaft is 200 NM. If the stator losses are 1500 08
watt and friction and wind age losses are 500 watt. Find
(1) Rotor cu loss
(2) Efficiency of motor.

- Q.5 Write short notes on 15
- 1) Induction generator
 - 2) FHP synchronous motor
 - 3) Hysteresis motor.

Section B

- Q.6 Solve any five of the following 10
1. What is the function of damper winding in alternator?
 2. Calculate the value of distribution factor for a 3 phase winding of a 4 pole alternator having 36 slots
 3. What do you mean by synchronous reactance of alternator?
 4. Write two differences between salient pole and cylindrical rotor
 5. What is pole pitch
 6. Enlist the different methods of excitation system of alternator
 7. What is meant by phase spread
 8. When show rotor excitation be applied during starting of a synchronous motor

- Q.7 a) Explain the synchronous impedance method for obtaining voltage regulation of an alternator 07
- b) A 3phase 50 Hz star connected alternator has 60 slots with 4 conductors per slot and flux per pole is 0.0543 wb, find EMF generated per phase, and emf generated between line terminals. Determine pitch factor and distribution factor when number of slots per pole are 9 and coil is short pitched by 3 slots 08

- Q.8 a) Derive equation of power output in cylindrical rotor alternator 07
- b) Explain the construction and working of a synchronous motor 08

- Q.9 a) What are the advantages of parallel operation of alternator and write conditions to be followed while paralleling the alternator with infinite Bus bar. 07
- b) Explain in detail the different torques in a synchronous motor 08

- Q.10 Write short note on 15
- 1) Armature reaction and its effects
 - 2) Alternator on infinite bus bar
 - 3) V curves and its Experimental setups.