PVP 20

Code:20EE3402

II B.Tech - II Semester – Regular / Supplementary Examinations
MAY - 2024

ELECTRICAL MACHINES - II
(ELECTRICAL & ELECTRONICS ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Define slip and discuss its effect on rotor quantities.	L3	CO2	6 M
	b)	Explain how the rotating magnetic field is produced in 3-phase induction motor and how the direction of rotating magnetic field is reversed.	L3	CO1	8 M
OR					
2	a)	Derive the expression for maximum torque of induction motor.	L4	CO4	7 M
	b)	Draw and explain the torque slip characteristics of induction motor.	L3	CO4	7 M
UNIT-II					
3	a)	Discuss speed control of induction motor based on slip control technique.	L4	CO4	7 M

	b)	A Squirrel cage induction motor when started by means of Star-Delta starter takes 150% of full load current and develops 45% of full load torque at starting. If an auto transformer is employed with 75% tapping, find the starting torque and current in terms of its full load values.	L4	CO4	7 M
OR					
4	a)	Discuss the principle of operation of Induction Generator.	L2	CO1	5 M
	b)	A 15kW, 400 V, 4-pole, 50Hz, 3-phase star connected induction motor gave the following test results. No Load Test: 400V, 9A, 1310W Blocked Rotor Test: 200V, 50A, 7100W Stator to rotor ohmic drops at standstill are assumed equal. Draw the circle diagram and evaluate i. Full load line current and slip. ii. Full load power factor and torque. iii. Efficiency at full load.	L4	CO4	9 M
UNIT-III					
5	a)	How the Alternator EMF phase sequence can be reversed?	L3	CO3	4 M

	b)	A 750 kVA, 11 kV, 4-pole, 3-phase, star connected alternator has synchronous reactance of 15%. Calculate the synchronizing power per mechanical degree of displacement at i) No-load ii) At full load 0.8 p.f lag. The terminal voltage in each case is 11 kV.	L4	CO5	10 M
		OR			
6	a)	Compare EMF and MMF methods of finding the voltage regulation.	L2	CO3	6 M
	b)	Discuss the effect of change in prime-mover input when the alternators are operating in parallel with load.	L4	CO5	8 M
		UNIT-IV			
7	a)	What is Hunting and how it can be minimized?	L1	CO3	6 M
	b)	With neat phasor diagram explain the effect of change in excitation when synchronous motor is operating under no load.	L3	CO5	8 M
		OR			
8	a)	List out the applications of synchronous motor?	L3	CO3	4 M

	b)	A 500 V, 1-Φ synchronous motor gives a net mechanical power of 7.46 kW and operates at 0.9 pf. lagging. Its effective resistance is 0.8 ohm. If the iron and friction losses are 500 W and excitation losses are 800W, estimate the armature current. Calculate the commercial efficiency.	L4	CO5	10 M
		UNIT-V			
9		With neat circuit diagram, procedure and formulas explain how the Equivalent circuit of 1-phase induction motor is obtained.	L3	CO3	14 M
		OR			
10	a)	Discuss why 1-phase induction is not self-starting?	L3	CO3	6 M
	b)	Explain Construction and working of BLDC motor.	L2	CO1	8 M