PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - Aug 2024

Semester: IV	**Date :08-08 -2024**
Course Code :EEE2017	**Time : 09.30am to 12.30pm**
Course Name: ELECTYRICAL MACHINES II	**Max Marks : 100**
Program :BTech DCET	**Weightage : 50%**

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A		
ANSWER ANY 4 QUESTIONS		**4Q X 5M=20M**
1	Write the equation to find rotor emf frequency, slip speed, synchronous speed and starting torque of 3 phase Induction Motor.	(CO 1)	[Knowledge]
2	Draw the torque- slip characteristics of 3 phase Induction Motor for different resistance value in rotor circuit and mark relevant points.	(CO 1)	[Knowledge]
3	A 4 pole , 3 ph Induction Motor operates from a supply with frequency 60 Hz. Calculate the speed of RMF.	(CO 1)	[Knowledge]
4	State the Conditions for Parallel operation of Alternators with Infinite Busbars.	(CO 3)	[Knowledge]
5	Briefly explain the term Synchronous Reactance Xs of Synchronous Generator	(CO 3)	[Knowledge]
6	Write 3 salient features of a Synchronous Motor	(CO 4)	[Knowledge]

PART B		
ANSWER ANY 5 QUESTIONS		**5Q X 10M=50M**
7	Briefly explain the winding factors that are mentioned in the E.M.F equation of an Alternator and write relevant equations. List 2 general features of a.c. armature windings.	(CO 3)	[Comprehension]
8	Represent the different power stages of 3 phase Induction Motor. Write the equations to find the performance of this machine. Explain in brief.	(CO 2)	[Comprehension]

9	Explain step by step the procedure to draw the output and torque line from the relevant diagrams of 3 ph Induction Motor. List the datas required and the name of the tests required to draw the same.	(CO 2)	[Comprehension
10	A synchronous motor has no starting torque. Explain how to make it run at Synchronous Speed. Draw appropriate diagrams to explain the concept.	(CO 4)	[Comprehension
11	Mention the tests that are to be conducted to obtain the parameters of 3 phase Induction Motor and hence draw the transformer equivalent circuit of the 3-phase induction motor.	(CO 1)	[Comprehension
12	Draw the constructional details of A C Generator and explain the parts.	(CO 3)	[Comprehension
13	Synchronous Motor can be used to improve the power factor. With necessary diagrams explain the concept.	(CO 4)	[Comprehension

PART C			
ANSWER ANY 2 QUESTIONS		2Q X 15M=30M	
14	a) A 12-pole, 3-phase alternator driven at a speed of 500 r.p.m. supplies power to an 8-pole, 3-phase induction motor. If the slip of the motor, at full-load is 2.2 %, Identify the data that are required to study the performance of the machine b) A 12-pole, 3-phase, 600-V, 50-Hz, star-connected, induction motor has rotor-resistance and stand-still reactance of 0.035 and 0.52 ohm per phase respectively. Compute Speed at maximum torque.	(CO 1)	[Application]
15	A 3 phase, 16 pole Alternator has a star connected winding with 144 slots and 12 conductors per slot. The flux per pole is 0.025 wb, sinusoidally distributed and the speed is 425 rpm. Find the phase and line emf generated. Assume full pitch coil.	(CO 3)	Application]
16	3 phase synchronous motor is having following specifications: 72 kW, 4-pole, frequency- 50 Hz, 400 V. It operates at 0.75 lagging. The efficiency of the motor is 92%. Calculate any 4 unknown details from the given datas.	(CO 4)	Application]