Regulation18 *Subject code:* 2P4BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech IV Semester Supplementary Examinations, July 2022

ELECTRICAL MACHINES-II

(EEE)

Maximum Marks: 70 Date:26.07.2022 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Define rotor frequency.
2 Write a short note on Squirrel cage induction motor.
3 What is blocked rotor test .
4 Explain speed control of 3-ϕ IM using change of frequency
5 Mention the uses of damper windings in a synchronous machine?
6 Define pole pitch, coil span factor?
7 What is distribution factor and write down the formula for distribution factor.
8 Why synchronous motor is a constant speed motor?
9 What is capacitor start induction motor?
10 Explain double revolving field theory.

Part-B

Answer All the following questions. (10M X 5=50Marks)

11 Explain the 3 phase induction motor operation under injection of an e.m.f. into the rotor circuit 10

OR

12 Explain the construction and working of three phase sliping induction motor. 10

13 a) How is the speed of a 3-phase induction motor controlled by its stator voltage control? 5

b) A 4-pole induction motor and 6-pole induction motor are connected in cumulative cascade at 50 Hz supply. The frequency in the secondary circuit of the 6-pole motor is observed to be 1.0 Hz. Determine the slip in each machine and combined speed of the set. 5

OR

14 Explain in detail about the various starting methods of 3-phase induction motors. 10

15	Derive an expression for induced emf per phase in a 3-phase alternator? mention how different winding factor affect the induced emf.	10
	OR	
16	a) Explain the EMF equation of an Alternator b) A 3 phase,16 slots, star connected alternator has 144 slots on the armature periphery. Each slot contains 10 conductors. It is driven at 375 rpm. The line value of emf available across the terminals is observed to be 2.657 kv. Find the frequency of the induced emf and flux per pole.	10
17	Write short notes on the following: i) causes of Hunting and its suppression ii) Mathematical analysis of power developed in Synchronous motor	10
	OR	
18	a) Explain the conditions that must be fulfilled for parallel operation of two synchronous generators. b) A 12 KVA,440 V, 50 Hz, star connected synchronous generator supplies rated load at 0.8 power factor lagging. The armature resistance and synchronous reactance are 0.3 Ω and 8 Ω respectively. Determine the torque angle and the voltage regulation.	5 5
19	Explain the principle of operation of Universal motor.	10
	OR	
20	Explain the operation of capacitance split phase induction motor.	10