

**R20 Regulation****Subject code: 3P4BC****TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

B.Tech IV Semester Supplementary Examinations, February 2024**ELECTRICAL MACHINES – II****(EEE)****Maximum Marks: 70****Date: 21.02.2024****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 which carries 10M.
 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)		CO	Bloom Tx
1	Why are the rotor slots of a 3-phase induction motor skewed?	CO1	L2
2	Why is the efficiency of a 3-phase induction motor less than of a transformer?	CO1	L2
3	Derive the condition for maximum torque at the time of starting in a 3- ϕ Induction Motor.	CO2	L2
4	Explain the speed control of 3- ϕ IM using cascade connection.	CO2	L2
5	Define pitch factor and distribution factors?	CO3	L2
6	What are the conditions required for parallel operation of alternators?	CO3	L2
7	List out the applications of synchronous motors?	CO4	L2
8	List the differences between salient and non-salient pole alternators.	CO4	L2
9	Define Slip	CO5	L2
10	Mention the applications of Universal motor.	CO5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)			
11	A. Compare the Squirrel Cage Rotor and Phase Wound Rotor in constructional aspects. [5] B. A 4 Pole, 50 Hz Three Phase Induction Motor rotates at 1450 rpm. Find a) Synchronous Speed b) slip c) rotor frequency. [5]	CO1	L3
	OR		
12	Derive and explain rotating magnetic field in a three-phase induction motor. [10]	CO1	L3
13	Explain the conducting procedure of No-load test on three phase induction motor. [10]	CO2	L3
	OR		
14	Illustrate the principle of operation of induction generator? [10]	CO2	L3

15	Describe Double revolving field theory. [10]	CO3	L4
	OR		
16	From the following test results, determine the voltage regulation of a 2000 V, three - phase Alternator delivering a current of 100 A at i) Unity Power factor ii) 0.8 pf leading iii) 0.71 pf lagging. Test Results: Full load current of 100 A is produced on short circuit by a field excitation of 2.5 A. An emf of 500 V is produced on open circuit by the same excitation. The armature resistance is 0.8 ohm. [10]	CO3	L3
17	A. List out the conditions for parallel operation of synchronizing an Alternator. [5] B. A 500kVA, 3-phase, star-connected alternator has a rated line voltage of 3300V. The resistance and synchronous reactance per phase are 0.3 and 4 ohms respectively. Calculate the voltage regulation at full load and 0.8 p.f lag. [5]	CO4	L4 L4
	OR		
18	A. State the special features of a Synchronous Motor. [5] B. What is Synchronous Condenser? Explain its use. [5]	CO4	L3 L3
19	Explain the constructional details and principle of operation of a split phase induction motor and mention its applications. [10]	CO5	L3
	OR		
20	A. Describe the working principle of shaded pole motor. [5] B. Illustrate the working of Capacitor Start Induction Motor. [5]	CO5	L4 L4