R18 Regulation *Subject code:2P4BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Regular/Supplementary Examinations, July 2021

ELECTRICAL MACHINE-II

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Maximum Marks: 70 Date:31.07.2021Duration: 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)

1 Write about frequency of rotor current.
2 What are the applications of Induction Motors?
3 What is crawling.
4 Draw the phasor diagram of Induction motor under no load.
5 What is pitch factor.
6 Explain about leakage reactance in synchronous generator.
7 Define synchronizing power.
8 List the applications of synchronous condenser.
9 List the applications of shaded pole motor
10 Why Single phase induction motor is not self-starting motor.

Part-B

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

11 A. Explain the Principle of Operation of Poly Phase Induction Motor. 5M
B. Differentiate between Cage and Wound rotor type Induction Motor. 5M

OR

12 A. Explain about production of rotating magnetic field in Induction Motor. 5M
B. A 4-Pole, 3 Phase Induction motor operates from a 440V AC supply where the frequency is 50 Hz, Calculate;
1) The speed at which magnetic field of the stator is rotating
2) Speed of the rotor when the slip is 0.04.
3) Frequency of the rotor current when the slip is 0.03.
4) Frequency of the rotor current at stand still. 5M

13 A. Derive the torque equation for a 3-phase Induction motor. 5M
B. Explain the torque slip characteristics of a 3-phase Induction motor. 5M

OR

14 A. Explain the effect of change in supply voltage and voltage/frequency speed control methods of three phase induction motor. 5M

B. A 50 Hz, 8-Pole Induction motor has F.L Slip of 4 %, the rotor resistance/phase is 0.01 ohms and standstill reactance/phase is 0.1 ohm. Find ratio of maximum to full load torque and the speed at which the maximum torque occurs. 5M

15 A. Derive the EMF Equation of a Synchronous Generator. 5M
B. Explain about armature reaction in Synchronous Generator. 5M

OR

16 A. Explain the regulation of Synchronous Generator by A.S.A method. 5M
B. A 3 Phase 16 pole alternator has a star connected winding with 144 slots and 10 conductors per each slot. The flux per pole is 0.03 Wb, sinusoidally distributed and the speed is 375 r.p.m. Find the frequency r.p.m and phase and the line emf, Assume full pitched coil. 5M

17 A. Explain the effect of change of excitation in synchronous generators. 5M
B. Derive the expression for synchronizing power of alternator when connected to infinite bus. 5M

OR

18 A. Explain the Principle of operation of synchronous motor. 5M
B. Explain about the synchronous condenser. 5M

19 A. Explain in detail about Double revolving field theory. 5M
B. Discuss the constructional and working principle of single-phase induction motor. 5M

OR

20 A. Explain about capacitor start single phase induction motor. 5M
B. List the advantages and disadvantages of universal motors. 5M