



R18 Regulation

Subject code: 2P4BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, September 2023

Electrical Machines-II

Maximum Marks: 70

(EEE)

Date: 19.09.2023 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 What are advantages of slip ring over squirrel cage rotor?
- 2 Derive torque equation of 3-phase induction motor
- 3 Explain the principle of working of an Induction generator
- 4 Draw the Equivalent circuit of no-load test of a 3-phase induction motor
- 5 Write down the formula for distribution factor
- 6 Define pole pitch, coil span factor?
- 7 List the factors that affect the load sharing in parallel operating generators?
- 8 Why synchronous motor is a constant speed motor?
- 9 How the synchronous motor can be used as synchronous condenser?
- 10 Give the working principle of universal motor?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Describe the principle, construction and operation of 3 phase Induction motor. (10M)
- OR
- 12 Explain the principle of production of rotating magnetic field in a 3-phase induction motor. (10M)
 - 13 a) An 8 pole 50 Hz 3 phase slip ring induction motor has effective rotor resistance of 0.08 ohms per phase. Starting speed is 650 rpm. How much resistance must be inserted in the rotor phase to obtain the maximum torque at starting? Ignore the magnetizing current and stator leakage impedance. (5M)
 - b) Define the term slip of an induction motor. Explain its significance. (5M)
- OR
- 14 Explain the various speed controlled methods of a 3-phase IM (10M)
 - 15 Derive an expression for induced emf per phase in a 3-phase alternator? mention how different winding factor affect the induced emf. (10M)
- OR
- 16 What is meant by synchronization? Explain the way of synchronizing an alternator to the infinite bus bars. (10M)

- 17 a) Explain the power developed by synchronous motor. (5M)
b) a 400V 50HZ 6 pole 3-phase star connected synchronous motor has a synchronous reactance of 4ohms/phase and a resistance of 0.5ohm/phase. on full load, the excitation is adjusted so that machine takes an armature current of 60A at 0.866 p.f leading. (5M)
- OR
- 18 What is synchronizing power and explain its role in load sharing during parallel operation? (10M)
- 19 Explain the operation of resistance split phase induction motor. (10M)
- OR
- 20 Explain the operation of capacitance split phase induction motor. (10M)