TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

Regulation R18 **Subject code:2P3BD**

B.Tech III Semester Regular/Supplementary Examinations, February 2021

ELECTRICAL MACHINES- I

(Electrical and Electronics Engineering)

Maximum Marks: 70 Date: 24.02.2021 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 Write down the expression for torque in round rotor machine.
2 Define field energy and Co-energy.
3 What are the types of armature winding? Differentiate them.
4 Mention the reason for fall of terminal voltage in D.C generator.
5 Why the series motor is never start at no load condition?
6 How does the four point starter differ from three point starter?
7 Why transformer rating is expressed in KVA?
8 What happens if DC supply is applied to the transformer?
9 Define all day efficiency of a transformer.
10 What are the conditions for parallel operation of a transformer?

Part-B

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

11 Derive an expression of lifting power of magnet. 10M

OR

12 Find an expression for the magnetic force developed in a doubly excited magnetic system. 10M

13 Explain about armature reaction in DC generator 10M

OR

14 Explain the process of commutation in a D.C machine. 10M

15 What is Back EMF? Derive the speed relation of DC motor. Determine the motor speed under load condition. If a DC Shunt motor takes a current of 5A at no load with terminal voltage 230 V and run at 1000rpm.The armature and field resistance is 0.2 ohm and 230 ohm .Under load condition motor takes a current of 30A. 10M

OR

16 Explain in detail three point starter to limit the starting current in DC motor with neat diagram. 10M

17 Enumerate the assumptions made in an ideal transformer. Starting with an ideal transformer on no-load, explain its working under lagging and leading power factor load condition. 10M

OR

18 (i)Develop an equation for induced emf in a transformer winding in terms of flux and frequency. 10M

(ii)A 230/460V transformer has a primary resistance of 0.2 ohm and reactance of 0.5ohm and the corresponding values for the secondary are 0.75 and 1.8 ohms respectively. Find the secondary terminal voltage when supplying 10A at 0.8 p.f lagging.

19 Explain the various types of three phase transformer connections and its application. 10M

OR

20 Explain the operation and principle of auto transformer and prove that copper used in auto transformer is less than two winding transformer. 10M