



R20 Regulation

Subject code: 3P3BD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, December 2025

ELECTRICAL MACHINES-I (EEE)

Maximum Marks: 70

Date: 22.12.2025

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) | | Marks | CO | BTL |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|-----|
| 1 | Explain the galvanometer coil. | 2M | 1 | L1 |
| 2 | Define relay? | 2M | 1 | L1 |
| 3 | Compare lap and wave winding? | 2M | 2 | L1 |
| 4 | What is the action of commutator and brushes of a d.c machine. | 2M | 2 | L1 |
| 5 | A d.c shunt motor is connected to a 3-point starter. Explain what would happen if the field circuit becomes open circuit with the motor running at no-load. | 2M | 3 | L1 |
| 6 | Write the expressions for core losses and remedial measures to reduce them in a dc machine. | 2M | 3 | L1 |
| 7 | List out the merits and de merits of core type and shell type of transformer | 2M | 4 | L1 |
| 8 | How to reduce the leakage flux in transformer | 2M | 4 | L1 |
| 9 | Explain the principle of transformer. | 2M | 5 | L1 |
| 10 | Why transformer rating is expressed in KVA? | 2M | 5 | L1 |

Part-B

| Answer All the following questions. (5X10M=50Marks) | | Marks | CO | BTL |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|-----|
| 11 | Discusses the self inductance and mutual inductance of the coil. | 10M | 1 | L2 |
| OR | | | | |
| 12 | Explain about the armature reaction? | 10M | 1 | L2 |
| 13 | Explain the construction of a dc machine with a neat sketch. | 10M | 2 | L2 |
| OR | | | | |
| 14 | Explain about the Cross magnetizing and de- magnetizing? | 10M | 2 | L2 |
| 15 | With the help of neat circuit diagram, explain Swinburne's test and derive the relations for efficiency (both for generator and motor) also state the merits and demerits of this method. | 10M | 3 | L2 |
| OR | | | | |
| 16 | What is the necessity of starter in a DC motor? Explain the working principle of 4-point starter with a neat sketch. Also explain about protective measures in the starter. | 10M | 3 | L2 |

| | | | | |
|----|---------------------------------------------------------------------------------------------------------------------|-----|---|----|
| 17 | With a circuit explain how to obtain equivalent circuit by conducting OC and SC test on a single phase transformer. | 10M | 4 | L2 |
| | OR | | | |
| 18 | Write short notes on types of losses exist in a transformer. | 10M | 4 | L2 |
| 19 | Examine the operation of a auto transformer. | 10M | 5 | L2 |
| | OR | | | |
| 20 | Examine the effect of non linear characteristics of B-H curves of a magnetic material. | 10M | 5 | L2 |