



R22 Regulation **Subject code:4E3BD**
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
 (Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Regular/Supplementary Examinations, December 2024
Electrical Machines-I
(EEE)

Maximum Marks: 60

Date:09.12.2024

Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 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		CO	Bloom Tx
All the following questions carry equal marks (10X1M=10 Marks)			
1.a)	Write the function of brushes in DC machines.	1	BL1
b)	Define compensation winding.	1	BL1
c)	List few applications of DC compound motor.	2	BL1
d)	Select which type of speed control method is used to control DC motor above rated speed.	2	BL1
e)	List few salient points of direct testing of DC motors.	3	BL1
f)	Define stray losses.	3	BL1
g)	Discuss the purpose of using conservator in transformers.	4	BL2
h)	Illustrate about efficiency related to transformers.	4	BL1
i)	Define auto transformer.	5	BL1
j)	List the different types of poly-phase connections in transformers?	5	BL1
Part-B		CO	Bloom Tx
Answer All the following questions. (5X10M=50Marks)			
2	A) Construct the DC generator with details. [5M] B) A 6-pole wave wound DC generator has 90 slots and each slot has 6 conductors. Calculate the emf induced, if the generator rotates at 1500 rpm and the flux per pole is 3mWb. [5M]	1	BL3 BL3
OR			
3	A) Deduce the EMF equation of DC generator. [5M] B) Explain the effect of armature reaction in DC generator [5M]	1	BL4 BL3
4	A) Explain the working of 4 point starter in DC motors [5M] B) Classify the DC motors with equivalent circuits. [5M]	2	BL3 BL4
OR			
5	A) Explain the speed control of DC motor using armature voltage method. [5M] B) A 230V DC shunt motor takes,5A at no load and runs at 1000rpm. Calculate the speed when loaded and taking a current of 30A. Consider armature field resistances are 0.2Ω and 230Ω respectively. [5M]	2	BL3 BL3

6	With the help of neat circuit diagram, explain the regenerative test and derive the relationships for efficiency. (Both as motor and generator) [10M]	3	BL3
OR			
7	Two shunt machines loaded for Hopkinson test takes 15A at 200V from the supply. The motor current is 100A and the shunt currents are 3.5A and 2.5A. If the armature resistance of each machine is 0.03Ω . Calculate the efficiency of each machine for this particular load connections. [10M]	3	BL4
8	A) Explain the working of 1-phase transformer with load condition. [5M] B) Deduce the condition for maximum efficiency of a transformer. [5M]	4	BL4 BL4
OR			
9	A) Differentiate core type and shell type transformers in construction. [5M] B) The low voltage winding of a 300KVA 11000/2200V, 50Hz transformer has 190 turns and resistance of 0.06Ω . The high voltage side has 910 turns and resistance of 1.6Ω . When the low voltage winding is short circuited, the full load current is obtained with 550V applied to hv side. Calculate the equivalent resistance and leakage reactance referred to high voltage side. Assume full load efficiency as 98.5%. [5M]	4	BL4 BL3
10	A) Explain the parallel operation of transformer with equal voltages. [5M] B) Explain about open circuit test in single phase transformer. [5M]	5	BL4 BL4
OR			
11	Explain the Poly-phase connection of Delta-Delta connection in transformers with neat diagram. [10M]	5	BL4