R20 Regulation *Subject code: 2E8BD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VIII Semester Regular Examinations, April 2024

Utilization of Electrical Energy

(EEE)

Maximum Marks: 70 Date:27.04.2024 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 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)		CO	Bloom Tx
1	Differentiate intermittent and continuous loads.	1	L2
2	List out the factors influencing the selection of electric motor in drive.	1	L1
3	List few salient points of induction heating	2	L2
4	Enumerate the drawbacks of arc welding	2	L2
5	Define Lux and Lumen	3	L1
6	What is Mean Spherical Candle Power (MSCP).	3	L1
7	Write few advantages of regenerative braking used in traction.	4	L2
8	What are the special features of traction motor?	4	L1
9	What is adhesive weight of an electric locomotive?	5	L1
10	Write the units of specific energy consumption and track resistance	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)			
11	A. Draw and explain block diagram of Electric drive. (5M) B. Discuss various types of industrial loads. (5M)	1	L2 L3
	OR		
12	A. Explain different speed control methods of AC motor drives. (5M) B.A DC series motor takes 20A at 400V to drive a fan at 250 r.p.m. Its combined resistance of armature and field is 1Ω. If the torque required to drive the fan varies as the square of the speed, find the necessary applied voltage and current to drive the fan at 300 r.p.m. (5M)	1	L3 L3
13	A. Compare AC and DC welding. Draw the schematic of welding circuit. (5M) B. List the advantages of electric heating over other types of heating. (5M)	2	L3 L2
	OR		
14	A. With a neat diagram, explain the process of Dielectric heating. (5M) B. Explain the working of resistance welding. (5M)	2	L2 L3
15	A. What are polar curves as applied to light sources? (5M) B. A room with an area of 6 × 9 m is illustrated by ten 80-W lamps. The luminous efficiency of the lamp is 90 lumens/W and the coefficient of utilization is 0.68. Find the average illumination. (5M)	3	L2 L3

	OR		
16	A. Explain the laws of illumination. (5M) B. Give the comparison between tungsten filament lamps and fluorescent tubes. (5M)	3	L3 L3
17	A. Explain the advantages of electric braking used in traction. (5M) B. Explain the Quadrilateral speed time curves for train movement. (5M)	4	L3 L3
	OR		
18	A. Discuss System of electric traction and track electrification in India. (5M) B. A train is required to run between stations 1.5km apart a scheduled speed of 30 kmph, the duration of stops being 15 seconds. The braking retardation is 3.5 kmphps. Assuming a trapezoidal speed-time curve, calculate the acceleration, if the ratio of maximum speed to average speed is to be 1.3. (5M)	4	L2 L3
19	A. Enumerate the factors which effect specific energy consumption of trains operation at a given scheduled speed. (5M) B. Explain the effect of varying acceleration and braking retardation in traction. (5M)	5	L2 L3
	OR		
20	An electric train while going down an incline of 1 in 100 has the following speed-time curve. (a) Starting from rest a uniform acceleration of 2 kmphps for 25 sec (b) Steady speed for 45 sec (with mechanical breaking), (c) Coasting for 55 sec and (d) Breaking at a rate of 3.5 kmphps. Assume the track resistance as 45 N per tonne, allowance for rotational inertia 9%, overall efficiency70%, calculate the specific energy consumption. (10M)	5	L4