GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2022
UTILIZATION OF ELECTRIC POWER
EE801B

TIME ALLOTTED: 3 HOURS **FULL MARKS: 70**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP – A
(Multiple Choice Type Questions)

Answer any ***ten*** from the following, choosing the correct alternative of each question: **10×1=10**

			Marks	CO No
1.	(i)	Candela Standard is established by a. Platinum surface flash point b. Fluorescent lamp c. Carbon lamp d. None of these	1	CO2
	(ii)	Quadrilateral speed-time curve is a better approximation to the actual condition, for a. Sub-urban services b. Urban services c. Mainline services d. Urban and sub-urban services	1	CO1
	(iii)	The speed of a steam locomotive is controlled by a. Applying brakes b. Gearbox c. Regulating steam flow to engine d. Flywheel	1	CO1
	(iv)	The method that can bring the locomotive to standstill is a. Rheostatic braking b. Regenerative braking c. Plugging d. None of these	1	CO1
	(v)	The type of d.c. motor used in electric traction is a. Series b. Shunt c. Separately excited d. None of these	1	CO1
	(vi)	Tractive effort is required a. To overcome the gravity component of train-mass b. To overcome friction, windage and curve resistance c. To accelerate the train mass d. All of these	1	CO1

(vii)	In high frequency induction heating the object is heated by a. Conduction b. Convection c. Electromagnetic induction d. Radiation	1	CO3
(viii)	An aArc welding supply set should have terminal voltage - load current curve as a. Highly drooping b. level c. Mildly sagging d. Rising upwards	1	CO3
(ix)	Series inductor in a direct arc heating furnace a. Reduces power loss b. Increases arc stability c. Reduces arc current d. Increases output	1	CO3
(x)	Distance between two stations is 1 km, and schedule speed is 30 kmph. station stop time is 20 secs. Average speed is a. 25.7 kmph b. 36 kmph c. 45 kmph d. 54 kmph	1	CO1
(xi)	The current flow through electrolyte is due to the movement of: a. Holes b. Electrons c. Ions d. None of these	1	CO4
(xii)	The particles present in strong electrolytes are: a. Only molecules b. Mainly ions c. Ions and molecules d. Only atoms	1	CO4

GROUP – B
(Short Answer Type Questions)

Answer any ***three*** from the following: **3×5=15**

		Marks	CO No
2.	What is the difference between dead weight and acceleration weight?	5	CO1
3.	Describe in brief the application of linear induction motor in traction.	5	CO1
4.	State and prove with necessary diagram, the Inverse Square Law of illumination.	5	CO2
5.	What are the requirements of a good electric heating rod?	5	CO3
6.	What is the principal of electrolysis?	5	CO4

GROUP – C
(Long Answer Type Questions)

Answer any ***three*** from the following: **3×15=45**

			Marks	CO No
7.		An electric train has an average speed of 42 kmph on a level track between two stops 1400 mt. apart. The train is accelerated at 1.7 kmph per sec. and braked at 3.3 kmph per sec. Draw the speed-time characteristic of the run. Estimate the energy consumption at the axles of the train per tonne km. Take tractive resistant constant at 50 Nw/ tonne and allow 10% for rotational inertia.	15	CO1
8.	(a)	What do you mean by magnetic blowout effect in electric arc welding?	6	CO3
	(b)	How we can minimize magnetic blowout effect?	3	CO3
	(c)	Discuss the construction of electrodes for electric resistance welding.	6	CO3
9.	(a)	Discuss the basic theory of dielectric heating?	7	CO4
	(b)	what is the importance of frequency of supply?	3	CO4
	(c)	What do you mean by diathermy?	5	CO4
10.	(a)	Explain the process of extraction and refining of metals.	10	CO4
	(b)	What are the essential factors required for designing a good lighting scheme?	5	CO2
11.		Write short notes on any three:	3x5=15	
	(a)	Linear induction motor.	5	CO1
	(b)	Efficiency of series - parallel control of traction motors.	5	CO1
	(c)	Dielectric heating and its application.	5	CO4
	(d)	Speed-time curve of train movement.	5	CO1
	(e)	Law of illumination	5	CO2