U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**

Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**

Course Code: 22EE6PE2EU **Max Marks: 100**

Course: Electrical Power Utilization and Traction

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Explain the principle of dielectric heating	CO1	PO1	**05**
	b)	What are the essential requirements of good heating element.	CO1	PO1	**05**
	c)	Briefly classify and explain the methods of electric Welding.	CO1	PO1	**10**
		OR			
2	a)	What are the advantages and disadvantages of welding.	CO1	PO1	**05**
	b)	Compare resistance arc welding with resistance welding.	CO1	PO1	**05**
	c)	Explain in details the types of induction heating.	CO1	PO1	**10**
		UNIT - II			
3	a)	Draw and explain the working principle of refrigerator.	CO2	PO2	**10**
	b)	Draw the schematic diagram to explain ONLINE - UPS system.	CO2	PO2	**10**
		OR			
4	a)	Draw the schematic diagram to explain OFFLINE UPS System and LINE INTERACTIVE - UPS system	CO3	PO6	**10**
	b)	Draw the schematic diagram to explain working of air conditioning system.	CO3	PO6	**10**
		UNIT - III			
5	a)	Define the following: i)solid angle ii) candela iii) Luminous efficiency iv) M.S.C.P v)M.H.C.P	CO1	PO1	**08**
	b)	A 0.3 metre diameter diffusing sphere of opal glass having 15% absorption, encloses an incandescent lamp with a luminous flux of 4500lumens. Calculate average luminance of the sphere.	CO2	PO2	**04**
	c)	Give the construction and working of a fluorescent tube.	CO1	PO1	**08**

			OR			
	6	a)	Discuss the various factors involved in street lighting.	*CO2*	*PO3*	**10**
		b)	Describe the principle and construction of gas discharge electric lamps. Why are these being superseded by fluorescent lamps.	*CO2*	*PO3*	**10**
			UNIT - IV			
	7	a)	Draw and explain a typical speed – time curve for an electric train. What are The Factors which affect schedule speed of a train.	*CO3*	*PO3*	**06**
		b)	Deduce the expression for tractive effort exerted by road wheel in terms of wheel dia, motor torque, gear ratio and efficiency of transmission of power.	*CO3*	*PO3*	**06**
		c)	Suburban trains run with an average speed of 40 kmph between two stations 1.8 km apart. Values of acceleration and retardation are 1.8 km/h/s and 4.6 km/ph/ps. Calculate the maximum speed of the train assuming trapezoidal speed-time curve.	*CO3*	*PO3*	**08**
			OR			
	8	a)	Draw and explain a typical speed – time curve for an electric train. What are The Factors which affect schedule speed of a train.	*CO3*	*PO6*	**10**
		b)	Derive expressions for distance travelled using quadrilateral approximation method of v(t) curve.	*CO3*	*PO6*	**10**
			UNIT - V			
	9	a)	Explain how the difference in driving wheel diameters due to unequal wear affects the sharing of load	*CO4*	*PO3*	**08**
		b)	What are the requirements which an ideal braking system should possess?	*CO4*	*PO3*	**06**
		c)	What a note on diesel electric engine.	*CO4*	*PO2*	**06**
			OR			
	10	a)	Explain regenerative braking as applied to traction motors individually.	*CO4*	*PO3*	**08**
		b)	Discuss the suitability of series motors for traction duties with the help of their characteristic curves.	*CO4*	*PO3*	**06**
		c)	Discuss briefly the methods of speed control of single-phase AC series motors.	*CO4*	*PO2*	**06**

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