



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)**

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Utilization of Electrical Energy(23EE0221)

Course & Branch: B.Tech - EEE

Year & Sem: III-B.Tech & I-Sem

Regulation: R23

**UNIT –I
ELECTRIC DRIVES
Part A**

1	Define an electric drive.	[L1][CO1][2M]
2	List two advantages of electric drives over non-electric drives	[L2][CO1][2M]
3	Define continuous duty in electric drives	[L1][CO1][2M]
4	What are the main types of electric drives.	[L2][CO1][2M]
5	Mention two industrial applications of electric drives.	[L2][CO1][2M]

Part B

1	Explain the different types of Electric drives with neat diagrams and suitable applications.	[L1][CO1]	[10M]
2	Discuss in detail the factors affecting the choice and rating of an electric motor.	[L2][CO1]	[10M]
3	a) Discuss the Classification of Electrical Drives	[L1][CO1]	[5M]
	b) Describe the advantages and disadvantages of Electric drives	[L1][CO1]	[5M]
4	a) How do you select a motor for an industrial application?	[L2][CO1]	[5M]
	b) Explain the different types of Industrial loads.	[L1][CO1]	[5M]
5	Explain the starting and running characteristics of DC motors, Induction motors, and Synchronous motors with suitable diagrams.	[L1][CO1]	[10M]
6	Explain how electric drives are used in the following applications: (a) Elevators (b) Rolling mills (c) Electric vehicles	[L1][CO1]	[10M]
7	Describe the applications of Electric drives.	[L2][CO1]	[10M]
8	Write short notes on: (a) Continuous load operation (b) Intermittent load operation (c) Variable load operation	[L1][CO1]	[10M]
9	Explain the advantages and limitations of using AC drives over DC drives.	[L2][CO1]	[10M]
10	Compare individual drive, group drive, and multi-motor drive with neat diagrams.	[L1][CO1]	[10M]

**UNIT –II
ELECTRIC HEATING & WELDING
Part-A**

1	List any four advantages of electric heating over conventional methods.	[L1][CO2][2M]
2	State two applications of resistance heating	[L1][CO2][2M]
3	Define electric welding.	[L1][CO2][2M]
4	List any four advantages of electric welding over gas welding.	[L1][CO2][2M]
5	Write two differences between AC welding and DC welding.	[L1][CO2][2M]

1	Elaborate the meritorious advantages of electrical heating process over conventional methods.	[L1][CO2]	[10M]
2	Define electric heating and Explain different types of electrical heating methods	[L2][CO2]	[10M]
3	Describe the construction, working, and applications of direct and indirect resistance heating systems with neat diagrams.	[L2][CO2]	[10M]
4	a) Explain the method of dielectric heating used in electric heating.	[L2][CO2]	[5M]
	b) Discuss the applications of resistance heating.	[L2][CO2]	[5M]
5	Describe the working of Induction heating and mention its applications.	[L2][CO2]	[10M]
6	Explain the different methods of electric welding and their relative advantages	[L2][CO2]	[10M]
7	Describe with a neat sketch the various methods of electric resistance welding	[L2][CO2]	[10M]
8	Explain briefly the types of electric arc welding.	[L2][CO2]	[10M]
9	a) Compare resistance and arc welding	[L2][CO2]	[5M]
	b) Briefly discuss the types of welding electrodes	[L2][CO2]	[5M]
10	a) Write about various types of equipment used for electric welding	[L2][CO2]	[5M]
	b) Differentiate between A.C and D.C welding.	[L2][CO2]	[5M]

Part-B**UNIT –III
ILLUMINATION****Part-A**

1	Define any two terms used in illumination	[L1][CO3][2M]
2	Define illumination	[L1][CO3][2M]
3	State the laws of illumination	[L1][CO3][2M]
4	Give any two examples of sources of light	[L1][CO3][2M]
5	Mention any two applications of flood lighting.	[L1][CO3][2M]

Part-B

1	Explain about the Various terms used in illumination	[L1] [CO3]	[10M]
2	State and derive the inverse square law and Lambert's cosine law of illumination	[L1] [CO3]	[10M]
3	Explain the construction, working principle, and applications of a mercury vapor lamp with a neat diagram.	[L3] [CO3]	[10M]
4	Explain the construction, working principle, and applications of a sodium vapor lamp with a neat diagram	[L2] [CO3]	[10M]
5	Explain the construction and working of fluorescent lamp with advantages and disadvantages.	[L2] [CO3]	[10M]
6	a) Compare tungsten filament lamps and fluorescent tubes	[L1] [CO3]	[5M]
	b) A filament lamp of 500W is suspended at a height of 4.5 m above the working plane and gives uniform illumination over an area of 6 m diameter. Assuming an efficiency of the reflector as 70% and efficiency of lamp as 0.8 watt per candle power, determine the illumination on the working plane	[L3] [CO3]	[5M]
7	a) Explain the construction and working of a compact fluorescent lamp (CFL) with advantages and disadvantages.	[L1] [CO3]	[5M]

	b) A lamp having a uniform cp of 100 in all directions provided with a reflector which directs 60% of the light uniformly on to a circular area of 10m diameter. The lamp is hung 5m above the area. Calculate the illumination at the center.	[L1] [CO3]	[5M]
8	A room measuring 30m×15m is to be illuminated by 10 lamps and the average illumination is to be 85 lux. Determine the MSCP of each lamp if the utilization and depreciation factors are 0.5 and 0.8 respectively	[L3] [CO3]	[10M]
9	What are the design considerations of a good lighting system? Explain in detail	[L1] [CO3]	[10M]
10	a) Explain the principle of operation of LED lamps and list their advantages	[L1] [CO3]	[5M]
	b) Explain about the flood lighting	[L1] [CO3]	[5M]

UNIT –IV
ELECTRIC TRACTION
Part A

1	Define electric traction	[L1][CO4][2M]
2	What is a speed-time curve	[L1][CO4][2M]
3	List any two existing electric traction systems in India	[L1][CO4][2M]
4	List any two disadvantages of plugging	[L1][CO4][2M]
5	What is meant by magnetic levitation	[L1][CO4][2M]

Part B

1	a) Compare A.C traction with D.C traction	[L2][CO4]	[5M]
	b) Describe system of the electrical traction and track electrification	[L2][CO4]	[5M]
2	Discuss the characteristic features of a traction motor for effective traction systems	[L1][CO4]	[10M]
3	a) Discuss the existing electrical traction system in India.	[L1][CO4]	[5M]
	b) What are the special features of traction motors?	[L3][CO4]	[5M]
4	Explain the trapezoidal Speed–Time Curve used in electric traction services.	[L2][CO4]	[10M]
5	Draw and describe the Quadrilateral speed–time curves for various traction services.	[L3][CO4]	[10M]
6	A train is to run between two stations 1.6 km apart at an average speed of 40 kmph, the run is to be made to a quadrilateral N-T curve. Maximum speed is to be limited to 64 kmph, acceleration, to 2 kmph/s, coasting retardation to 0.16, and braking retardation to 3.2, Determine the duration of a acceleration, coasting and braking periods.	[L2][CO4]	[10M]
7	Describe how Plugging is employed in traction motor	[L2][CO4]	[10M]
8	Describe the principle and operation of rheostatic braking in traction motors.	[L2][CO4]	[10M]
9	Explain regenerative braking method used for traction motors.	[L3][CO4]	[10M]
10	a) A train has schedule speed of 30 km/hr over a level track distance between stations being 1 km. Duration of stop is 20 sec. Assuming braking retardation of 3 km/hr/sec and maximum speed 25% greater than average speed, calculate acceleration required to run the service.	[L2][CO4]	[5M]
	b) Write short notes on Magnetic Levitation (Maglev) vehicles	[L1][CO4]	[5M]

UNIT –V
Electrolytic Process
Part A

1	Define electrolysis	[L1][CO5][2M]
2	State Faraday's First Law of Electrolysis.	[L1][CO5][2M]
3	Mention two applications of electrodeposition.	[L1][CO5][2M]
4	Differentiate between extraction and refining of metals.	[L1][CO6][2M]
5	Write the overall cell reaction of a hydrogen–oxygen fuel cell.	[L1][CO6][2M]

Part B

1	Explain the basic principles of the electrolytic process. With suitable applications	[L2][CO5]	[10M]
2	State and explain Faraday's laws of electrolysis with suitable examples.	[L2][CO5]	[10M]
3	Explain the concept of energy efficiency in electrolytic processes and discuss the factors affecting it.	[L2][CO5]	[10M]
4	Describe the process of electrodeposition and explain its applications in industries.	[L1][CO5]	[10M]
5	Discuss the various factors governing the electrodeposition process.	[L3][CO5]	[10M]
6	Explain the mechanism of deposition of alloys and discuss its advantages and applications.	[L2][CO5]	[10M]
7	Explain the methods used for extraction of metals through electrochemical processes.	[L3][CO5]	[10M]
8	Describe the principles and processes involved in refining of metals by electrolytic methods.	[L2][CO6]	[10M]
9	Discuss the construction, working principle, and applications of fuel cells.	[L1][CO4]	[10M]
10	Explain different types of fuel cells and compare their advantages and limitations.	[L1][CO4]	[10M]

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