CMR INSTITUTE OF TECHNOLOGY	USN										

Internal Assesment Test - II

Sub:	ELECTRIC POWER UTILIZTION							Code:	10EE72
Date:	02 / 11 / 2016	Duration:	90 mins	Max Marks:	50	Sem:	7	Branch:	EEE

Answer Any FIVE FULL Questions

		Marks	OBE	
			CO	RBT
1. I	Describe Electroplating Process. Summarize the different stages involved in it.	[10]	CO2	L2
2	Discuss the following terms associated with Illumination. (a)Illumination (b)Luminous Flux (c)Coefficient of Utilization (d)Depreciation Factor (e)Reflection Factor	[10]	CO3	L2
3	Examine the different Lighting Schemes.	[10]	CO3	L3
4 (a)	Discuss Electric Traction Systems.	[5]	CO5	L2
(b)	Analyze the Requirements of an Ideal Traction System.	[5]	CO5	L4
5	Compare AC and DC Systems of Traction.	[10]	CO5	L4
6	Estimate the number and wattage of Lamps which would be required to Illuminate a workshop space 60 m X 15 m by means of Lamps mounted 5 m Above the working plane. The average Illumination required is 100 lux. Coefficient of Utilization = 0.42 Maintenance Factor = 0.78 Luminous Efficiency = 16 Lumens / Watt Space height ratio = Unity	[10]	CO3	L2
7	An Electric Train is to have acceleration and braking retardation of 0.8 km/hr/s and 3.2 km/hr/s respectively. If the ratio of maximum to average speed is 1.3 and the time for stop is 26 seconds. Calculate the schedule speed from a run of 1.5 km. Assume Simplified Trapezoidal Speed Time Curve.	[10]	CO5	L3

Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1:	Analyze the advantages and methods of Electric Heating	1	-	-	-	1	1	-	-	1	-	-	-
CO2:	Summarize the processes involved for the extraction and refining of metals	-	-	-	-	1	1	-	-	1	-	-	-
CO3:	Explain the different types of Lamps and their working	1	-	-	-	1	1	-	-	1	-	-	-
CO4:	Identify the Factors affecting Electrodeposition Process	1	-	-	-	1	1	-	-	1	-	-	-
CO5:	Explain the methods of Speed Control of Traction Motors	1	-	-	-	1	2	-	-	1	-	-	-
CO6:	Analyze the configuration and performance of Electrical Vehicles	1	-	-	-	1	2	-	-	1	-	-	-

Cognitive level	KEYWORDS
L1	List, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
L2	summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
L3	Apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover.
L4	Analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer.
L5	Assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize.

PO1 – *Engineering knowledge*; PO2 – *Problem analysis*; PO3 – *Design/development of solutions*; PO4 – *Conduct investigations of complex problems*; PO5 – *Modern tool usage*; PO6 – *The Engineer and society*; PO7- *Environment and sustainability*; PO8 – *Ethics*; PO9 – *Individual and team work*; PO10 – *Communication*; PO11 – *Project management and finance*; PO12 – *Life-long learning*

Solution for Internal Test 2

Electric Power Utilization

Answer any Five Full Questions. Each Question carries 10 marks :

1. Explanation of Electrolytic Process – 6 Marks

   Diagram – 4 Marks

2. Definition of the terms associated with Illumination.

   Definition of each term - 2 Marks each. 2 X5 = 10 Marks

3. Different Lighting Schemes – Direct Lighting , Indirect Lighting, Semi direct, Semi direct, General Lighting Schemes – Explanation – 7 Marks

   Diagram – 3 Marks

4. (a) Electric Traction Systems – Types – Explanation - 5 Marks.

   (b) Requirements of an Ideal Traction System – List the requirements – 5 Marks.

5. Comparison of AC and DC Systems of Traction – List the points – 10 Marks
6. Space – Height Ratio = Horizontal distance between the lamps/ Mounting Height = unity

   Number of Lamps Length wise = 60/5 =12 (2 Marks)

   Number of Lamps Breadth wise = 15/5 = 3 (2 Marks)

   Total no : of lamps = 12 X 3 = 36 Lamps

   Gross Lumens required = E A/ UF X MF = 100 X 900/ 0.42 X 0.78= 274725 Lumen – 2 Marks

   Total wattage required = Gross Lumens / Lumens per watt = 274725 / 16 = 17170.3 W

Wattage of each lamp = Total wattage / Number of Lamps = 17170.3/36 =476.95 W

Take the wattage as 500 W.

Arrangement of Lamps and wattage of Lamp - 4 Marks

7 $k = \alpha + \beta / 2\ \alpha\beta = 2.815$ – 2 Marks

$kVm2 – Vmt + D = 0$

Solving we get t = 154.23 seconds - 3 Marks

Schedule Time, tsch = t + 26 = 180.23 seconds - 2 Marks

Schedule speed , Vsch = D / tsch = 1500/ 180.23 = 8.323 m/s= 29.96 km/hr – 3 Marks