

K.RAMAKRISHNAN COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

SAMAYAPURAM, TRICHY– 621112

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

QUESTION BANK

VIII SEMESTER

EE8015-ELECTRIC ENERGY GENERATION, UTILIZATION AND CONSERVATION

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UNIT I - ILLUMINATION

Importance of lighting – properties of good lighting scheme – laws of illumination – photometry - types of lamps – lighting calculations – basic design of illumination schemes for residential, commercial, street lighting, factory lighting and flood lighting – LED lighting and energy efficient lamps.

PART - A

Q.No	Questions	Course Outcome	BT Level	Competence
1	Define luminous efficiency	CO1	K1	Remember
2	If the total lumens required are 7200 and coefficient of utilization is 0.3, calculate lamp lumens required	CO1	K2	Understand
3	Generalize the types of lighting system.	CO1	K1	Remember
4	Examine illumination laws	CO1	K2	Understand
5	Define luminous flux	CO1	K1	Remember
6	Define the term lux.	CO1	K1	Remember
7	Define lumen.	CO1	K1	Remember
8	What are the properties of heating materials?	CO1	K1	Remember
9	State the different types of electrical lamps used for Illumination.	CO1	K1	Remember
10	Why tungsten is selected as the filament material?	CO1	K1	Remember
11	Outline the various factors for designing the lightning scheme.	CO1	K2	Understand
12	Suggest suitable lamps for sports ground lighting application.	CO1	K2	Understand
13	What is flood lighting where is it generally used?	CO1	K1	Remember
14	Explain the importance of street lighting system	CO1	K2	Understand
15	Describe the term MSCP and lamp efficiency.	CO1	K1	Remember
16	Define solid angle	CO1	K1	Remember
17	Generalize plane angle.	CO1	K1	Remember
18	What do you understand by polar curves as applied to light source?	CO1	K1	Remember
19	Deduce why sodium vapor lamps are not preferred for indoor lighting.	CO1	K2	Understand
20	Discuss Stephan's law of radiation.	CO1	K1	Remember

PART-B

1	(i) Compare the output lumen of LED, CFL and Incandescent wattage. (7)	CO1	2	Understand
	(ii) Discuss in detail about the street or road lighting with neat Sketches. (6)		1	Remember
2	(i) Discuss laws of illumination and its limitations in actual practice. (6)	CO1	2	Understand
	(ii) A workshop dimension 30 metre * 20 metre is illuminated by 30 Nos. of 400 Watts Metal Halide lamps. The luminous efficacy of metal Halide lamp is 90 lumens/Watt. The depreciation factor is 1.2 and utilization factor is 0.6. Calculate the illumination level of the working plane. (7)	CO1	3	Apply
3	A hall 30m long and 12m wide is to be illuminated and the illumination required is 50 lumens/m ² . Deduce the number of fitting required, taking depreciation factor of 1.3 and utilization factor of 0.5. Given that the outputs of different types of lamp are given below: Watts 100 200 300 500 1000 Lumens 1625 3650 4720 9970 21520 (13)	CO1 CO1	3	Apply
4	(i) Describe and prove laws of illumination. (6)	CO1	2	Understand
	(ii) Design a street lighting of a road of 300metres long which is required to be illuminated by providing 40W fluorescent lamp. The width of the road is 4 m. Illumination is 0.6 lux. Assume efficiency of lamp as 70 Lumen/watt. (7)		3	Apply
5	Two street lamps are 20m apart and are fitted with a 500 C.P. lamp at a height of 8m above the ground each. Calculate the illumination at a point (a) Under the lamps each. (6) (b) Midway between the lamps (7)	CO1	3	Apply
6	(i) List the various types of lamps commercially available. Also specify the energy efficient lamps for domestic and industrial lighting applications. (6)	CO1	1	Remember
	(ii) Discuss the various steps followed in calculation of illumination for designing the residential lighting. (7)		2	Understand
	(i) Explain the various steps involved in designing of lighting		1	Remember

7	system for a workplace.	(7)	CO1		
	(ii) Discuss about Diffusion principle of street lighting	(6)		1	Remember

8	Explain the various steps followed in calculation of illumination for designing the flood lighting in sports ground. (13)	CO1	2	Understand
9	Point out the various factors to be taken into account for designing street lighting and flood lighting. (13)	CO1	2	Understand
10	Explain different types schemes employed in light to reach the surface	CO1	2	Understand
11	A drawing hall 30*15*5 m is to be provided with a general illumination of 120Lux. Taking coefficient of utilization as 0.5, depreciation factor as 1.4, Design the number of fluorescent tubes required, their spacing height, mounting height and total wattage. Take luminous efficiency of fluorescent tubes as 40 Lumen/Watt for 80watts tube. (13)	CO1	3	Apply
12	(i) Explain the operation of fluorescent lamp. (6) (ii) A classroom dimension 10 metre $\times$ 7.5 metre with a ceiling height of 4 metre is to be provided with general illumination of 300 lux. Considering a co-efficient of utilization is 0.5 and depreciation factor of 1.2. Calculate the number of 36 watts fluorescent lamps required. The luminous efficacy of 36 watts fluorescent lamp is 84 lumens per watt. (7)	CO1	2 3	Understand Apply
13	Explain about the following lamps with neat diagrams. (i) Incandescent lamp (ii) Sodium Vapour lamp (6) (7)	CO1	1	Remember
14	(i) Explain the construction and working of mercury vapour lamp. (6) (ii) A lamp of 500 c.p. is placed at the centre of a room 20*10*5 m. Calculate the illumination in each corner of the room. (7)	CO1	2 3	Understand Apply
PART-C				
1	Determine the average illumination of a room measuring 9.15m by 12.2 m illuminated by halogen 150 watt Lamps . The luminous efficiency of lamps can be taken as 14 lumen/watt and coefficient of utilisation is 0.35. (15)	CO1	3	Apply

2	In a photometric bench test balance is obtained when a standard lamp of 20 candela in the horizontal direction is 1.5m and the lamp being tested is 1.25m from the photometer screen (a) What is the luminous intensity of the test lamp (b)if the light from the test lamp is reduced by 15% ,What would be the respective distance of lamps from the screens? In this case the are fixed 3.5m apart and the screen moves between them. (15)	CO1	3	Apply
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