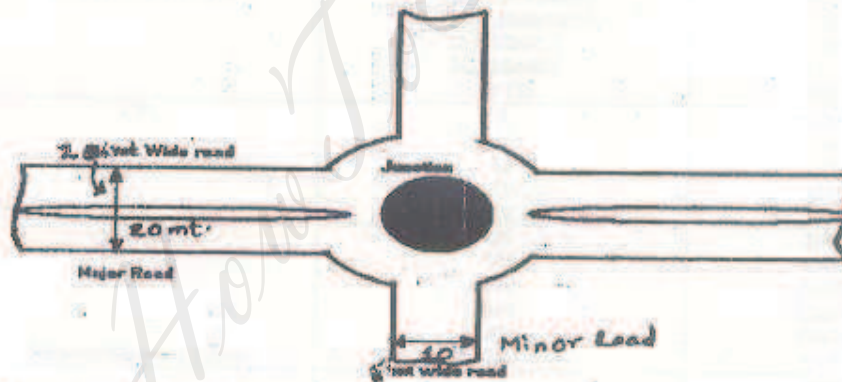


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Prob

- N.B.: 1. Q 1 is compulsory.
 2. Answer any four out of remaining six questions.
 3. Assumptions made should be clearly stated.
 4. Assume any suitable data wherever required but justify the same.
 5. Figures to the right indicate marks.
 6. Illustrate answers with sketches wherever required.
- Q.1 Consider an air-conditioned Meditation hall having an area of 20mt (W) x 12 mt (B) x 3.5mt (H). Assume suitable layout and describe the lighting design consideration. Design complete lighting system satisfying all the design consideration mentioned. Draw all the necessary layouts and sketches. Refer the COU chart and lamp data provided. If necessary assume any additional data with proper justification given. (20)
- Q.2 (A) Describe the classification of luminaries used for lighting system. Describe the various important parameters of lamps required to be considered while lighting design. (10)
 (B) Describe the constructional details, working principle, electrical properties, lighting features, wattages available and applications of the High Pressure Mercury Vapor lamps. (10)
- Q.3 (A) State the design considerations for the following: (12)
 (i) Restaurant
 (ii) Saree shop
 (iii) Conference room
 (B) Compare the various parameters of HPMV lamp, HPSV lamp, Metal Halide Lamps and Tungsten Halogen. (08)
- Q.4 (A) State and describe the various factors affecting selection of lamps for given application. Give at least one example for each of the factors. (08)
 (B) Write short notes on any two: (12)
 (i) Electrical distribution system for lighting
 (ii) Daylight Integration
 (iii) Utility Area Lighting
 (iv) Maintenance strategies used for lighting system
- Q.5 Design the lighting scheme for a major road shown in the figure.



Assume the width of the divider as 1 mt and the stretch of the major road on each side of junction is 4 Km. Assume suitable data if necessary. Clearly specify the selection and justification for following :

- (i) Design Considerations for major road (05)
 (ii) Type of arrangements of poles (02)
 (iii) Lamp and luminaries (02)
 (iv) Pole details and spacing (05)
 (v) Number of poles and lamps (02)
 (vi) Specify the design considerations for junction and minor road. (04)
- Q.6 (A) With reference to the sports lighting, describe the following applications features in terms of horizontal and vertical illuminance, glare limits, light sources luminaries and position of luminaries. Draw the necessary sketches. (12)
 (i) Indoor Swimming pool
 (ii) Cricket stadium
 (B) Explain lighting design considerations with the help of suitable sketches and diagrams for any one of the following applications. (08)
 (i) Industrial lighting
 (ii) Religious buildings

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Q.7 (A) Write short notes on the following (Any two):

- (i) Computer aided lighting design
- (ii) Emergency lighting
- (iii) Luminous intensity measurement with Goniophotometer

(B) Explain the various means of achieving energy efficiency for existing installations.

(08)

Data for Illumination Design problems

Coefficient of Utilization Chart

K	Rc=0.7			Rc=0.5			Rc=0.3		
	Rw=0.5	Rw=0.3	Rw=0.1	Rw=0.5	Rw=0.3	Rw=0.1	Rw=0.5	Rw=0.3	Rw=0.1
0	0	0	0	0	0	0	0	0	0
0.6	0.43	0.39	0.36	0.42	0.38	0.36	0.41	0.38	0.36
0.8	0.45	0.41	0.38	0.44	0.40	0.38	0.43	0.40	0.38
1.00	0.51	0.47	0.44	0.55	0.47	0.44	0.49	0.46	0.40
1.25	0.55	0.51	0.49	0.53	0.50	0.48	0.52	0.50	0.48
1.50	0.57	0.54	0.52	0.56	0.53	0.51	0.54	0.52	0.50
2.00	0.61	0.58	0.56	0.59	0.57	0.55	0.57	0.56	0.54
2.50	0.63	0.61	0.59	0.61	0.59	0.57	0.59	0.58	0.56
3.00	0.65	0.63	0.61	0.63	0.61	0.59	0.61	0.59	0.58
4.00	0.67	0.65	0.63	0.64	0.63	0.62	0.62	0.61	0.59
5.00	0.68	0.67	0.65	0.65	0.64	0.63	0.63	0.62	0.61

Lamp Data

Sr.No	Type of Lamp	Wattage	Lumen output
1	GLS	25	230
		40	415
		60	710
		100	1340
		200	3000
2	Tungsten Halogen	50 (Miniature Dichroic)	900
		300	5100
		500	9000
		1000	22000
3	Fluorescent (T8/ T5)	18 (Halo phosphate)	1015
		36 (Halo phosphate)	2450
		18 (82/84/86)	1300
		36 (82/84/86)	3250
4	CFL	28 (T5)	2800
		9	600
		11	760
		13	920
		18	1200
5	HPMV	26	1800
		80	3600
		125	6200
		250	12700
		400	22000
		1000	58600
6	Blended Mercury Lamp	160	4500
		70	5500
		150	12100
		250	20000
		400	36000
7	Metal Halide	70	5800
		150	13500
		250	25000
		400	47000

Utilization Factor Curve For Road Lighting Design
(Use it for any value of angle of tilt)

