Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019
Course Code: EE366
Course Name: ILLUMINATION TECHNOLOGY

Max. Marks: 100   Duration: 3 Hours

PART A
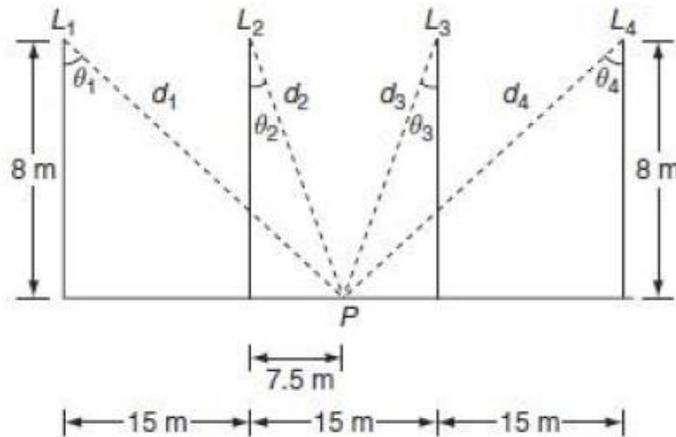*Answer all questions, each carries5 marks.*   Marks

1	What are the factors affecting the quality of artificial lighting?	(5)
2	With the help of appropriate sketches, explain polar luminance distribution curve	(5)
3	What are the desirable features of a luminaires?	(5)
4	What are the different lighting schemes used for street lighting? Explain with appropriate sketches.	(5)
5	What are the important factors to be considered while designing the flood lighting of a multi-storeyed building?	(5)
6	What are the different types of flood lights used for outdoor lighting	(5)
7	What are factors to be considered while selecting luminaries for different areas in hospitals?	(5)
8	Explain the design criteria for stadium lighting.	(5)

PART B
Answer any two full questions, each carries10 marks.

9	a)	What is a glare? How it is classified.	(3)
	b)	What are the different lighting schemes employed in interior lighting? Clearly state the percentage of light flux in different directions.	(7)
10	a)	Explain how illumination can be calculated for Line source and Surface source.	(4)
	b)	What is the effect of stroboscopic effect on visual comfort in an artificial lighting scheme? How the effect can be reduced	(4)
	c)	Explain the terms Mean Spherical Candle Power (MSCP) and Mean Hemi-spherical Candle Power (MHCP).	(2)
11	a)	Explain the term luminous efficacy? How the luminous efficacy of artificial light sources affect the operational cost of a lighting system?	(2)

b) Explain inverse square law and Lamberts cosine law with the help of neat (4) sketches

c) Four lamps 15m apart are arranged to illuminate a corridor. Each lamp is (4) mounted at a height of 8m above the floor level. Each lamp gives 450 Cd in all directions below the horizontal. Find the illumination at the point 'P' midway between second and third lamp.

PART C
Answer any two full questions, each carries10 marks.

12 a) An office 30m x 15m is illuminated by twin 40W fluorescent luminaries of (4) lumen output 5600 lumens. The lamps being mounted at a height of 3m from the work place, the average illumination required is 240 lux. Calculate the number of lamps required to be filled in the office, assuming the coefficient of utilization to be 0.6 and maintenance factor to be 0.8. Space to mounting height ratio is 1.25.

b) What is ULOR and DLOR? How these parameters aid in selecting luminaries for (4) different applications.

c) Calculate the room index for a hall of dimensions 10m X 8m X 3m. Luminaries (2) are suspended at height of 0.8m from the ceiling and work plane height is 0.85 from floor.

13 a) Define (2)

1. Coefficient of utilisation
2. Depreciation factor

b) A room 8m x12m is lighted by 15 lamps to a fairly uniform illumination of   (4)
    100 lm/m². Calculate the utilisation factor of the room, given that the output of
    each lamp is 1600 lumens.

c) What are the advantages and disadvantages of using LED light as street light?   (4)

14 a) Define up cast angle, outreach, pole set back and mounting height in street   (4)
        lighting. Give a clear picture showing all these.

    b) Explain the different types of fixtures used in street lighting.   (3)

    c) An assembly line space has an area of 40 m long, 20 m wide and 8 m in height.   (3)
        The luminaires are suspended 1.5 m below the ceiling level. The work table are
        placed 1 m high from the floor level. Calculate the minimum number of
        luminaires which must be installed to conform a recommended SHR_{max}
        (Space.height ratio) of 1.5. Show the layout of the luminaires. Also calculate the
        average illuminanace achieved with the minimum number of luminaires with
        each luminaire fitted with 4 numbers of fluorescent lamps with an initial lamp
        flux of 1350 lumen. Assume MF=0.77 and UF= 0.75

PART D
Answer any two full questions, each carries 10 marks.

15 a) A building frontage 50m x 25m is to be illuminated by flood lighting projectors   (10)
        situated 25m away. If the illumination is 50 lux, coefficient of utilisation is 0.5,
        depreciation factor 1.5, waste light factor 1.2. Estimate the number and size of
        projectors. Sketch the projectors recommended indicating the adjustments
        provided.

16 a) What are different factors to be considered while designing aesthetic illumination   (5)
        of bridges and statues?

    b) What is the importance of modelling and shadows in the case of sports field   (5)
        lighting?

17 a) What are the different methods available for aiming of lamp in flood lighting?   (5)

    b) The boundary of a football stadium is 100m x 50m. The recommended   (5)
        illumination level is 500 lux. Luminaries of 1000W with light output of 92000
        lumens are used for installation. Calculate the number of luminaries required to
        get the recommended level of illumination. Assume utilisation factor = 0.8,
        maintenance factor = 0.8, light loss factor = 1.2. Sketch the configuration of light
        fittings.

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