

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (S, FE) Examination May 2024 (2019 Scheme)



Course Code: EET463

Course Name: ILLUMINATION TECHNOLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

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| 1 | What are the factors that affect quality of good lighting? | (3) |
| 2 | What are the different types of artificial light sources | (3) |
| 3 | Define MHCP and MSCP | (3) |
| 4 | Explain how photometric bench is used for measuring candle power of a test lamp | (3) |
| 5 | A room 8 m x 12 m is illuminated by 26 fluorescent lamps 40 watts each. The average illumination was found to be 400 lux. Calculate the coefficient of utilisation. Take efficiency of lamps as 70 lumens per watt. | (3) |
| 6 | Define Space to Mounting height ratio | (3) |
| 7 | What are the various light arrangement styles in street lighting? | (3) |
| 8 | Explain the main objectives of flood lighting design | (3) |
| 9 | Explain any three features of auditorium lighting? | (3) |
| 10 | Explain the constraints in hospital lighting. | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

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| 11 | a) Explain Colour rendering and stroboscopic effect | (7) |
| | b) Explain with neat diagram the different types of artificial lighting system used. | (7) |

OR

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| 12 | a) Explain briefly the different types of lighting system based on lighting distribution | (7) |
| | b) What is a glare? How it is classified | (7) |

Module II

- 13 a) Explain with neat figures a.) Inverse square law b.) Lambert's Cosine law (7)
- b) Two lamps one of 200 C.P and another of 500 C.P are hung at height of 10m and 25m respectively. The horizontal distance between the poles is 80m. Determine the illumination at the mid point between the poles on the ground. (7)

OR

- 14 a) With neat diagram explain the measurement of M.S.C.P by integrating sphere (7)
- b) Two light source each having a uniform intensity of 600cd are mounted 8m high and 30m apart. Determine 1) illumination directly underneath one lamp (7)
2) illumination at a distance midway between the lamps

Module III

- 15 a) Define i) Maintenance factor, ii) Uniformity ratio, iii) Direct ratio, (iv) Coefficient of Utilization (8)
- b) An office 30m×15m is illuminated by twin 40W fluorescent luminaires of 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 fitted in the office, assuming the coefficient of utilisation to be 0.6 and maintenance factor to be 0.8. Also show the arrangements of lamps (8)

OR

- 16 a) The total, upward and downward light output from a luminaire are 1200 lm, 400 lm, 600 lm respectively. Find DLOR, ULOR, LOR and percentage of light energy absorbed in luminaire (6)
- b) Illustrate at least four fixtures used for interior lighting? (8)

Module IV

- 17 a) Explain the two basic principles employed in street lighting? (8)
- b) Define the terms a) Beam spread angle b) waste light factor associated with flood lighting (6)

OR

- 18 a) Determine the number of 1000W lamps needed to illuminate the front of a building 50m × 16m arranged so that uniform illumination of 90 lumens/m² on a surface is obtained. Assuming a luminous efficiency of 17.4 lumens/watt and a coefficient of utilization of 0.4, depreciation factor = 1.3 and waste light factor = 1.2 (6)

- b) What are the main factors to be considered while designing street/ road lighting? (8)

Module V

- 19 a) Describe any six characteristics of statue lighting (6)
b) The Jawaharlal Nehru Stadium, Kochi, needs a lighting renovation, list any eight features. (8)

OR

- 20 a) What are the objectives of aesthetic lighting? (6)
b) Explain features of hospital lighting (8)
