



22530

12223

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any FIVE of the following :

5 × 2 = 10

- (a) Draw a neat labelled diagram of Autotransformer Dimmer.
- (b) State any two uses of Arc lamps.
- (c) Give the long form of LASER. Also state any two types of LASER.
- (d) State any two differences between Dimmer control and ON/OFF control in lighting control.
- (e) Explain the concept of photometry in brief.
- (f) State the lighting design objectives for internal applications.
- (g) List out four important characteristics of factory lighting.

2. Attempt any THREE of the following :

3 × 4 = 12

- (a) Explain in brief the general and specific requirements for railway platform lighting (any six points).
- (b) Draw a neat labelled diagram of salt water dimmer and explain its working in brief.
- (c) Explain with neat sketch, the working of Metal halide lamp.
- (d) Compare Tungsten filament lamp with Fluorescent lamp on any four points.



3. Attempt any THREE of the following :**3 × 4 = 12**

- (a) State any four desirable characteristics of lighting required in Aquarium. Also suggest the type of lamp that can be used in Aquarium and its reason.
- (b) Explain the construction of Sodium Vapour lamp with its neat labelled diagram.
- (c) State the factors governing design consideration of industrial lighting. Also list out any four benefits of good industrial lighting.
- (d) Explain three point method for single lamp control with the necessary diagram.

4. Attempt any THREE of the following :**3 × 4 = 12**

- (a) Estimate the number and wattage of lamps which would be required to illuminate a workshop space 60×15 metres by means of lamps mounted 5 metres above the working plane. The average illumination required is about 100 lux. Coefficient of utilization = 0.4; luminous efficiency = 16 lm/W. Assume a space / height ratio of unity and a candle power depreciation of 20%.
- (b) Name the lamps suitable for following applications :
 - (i) Advertisement
 - (ii) Flood lighting
 - (iii) Street lighting
 - (iv) Hospital (any two for each application)
- (c) Explain with neat diagram, the working of thermal starter used in Fluorescent lamps.
- (d) State the function of Dimmer. List out any two types of Dimmers. Also draw Resistance Dimmer Circuit and label the same.
- (e) State any four important points that are to be followed while doing street lighting design.

5. Attempt any TWO of the following :**2 × 6 = 12**

- (a) (i) State laws of illumination.
- (ii) A lamp giving out 1200 lumen in all directions is suspended 8 m above the working plane. Calculate the illumination at a point on the working plane 6 m away from the foot of the lamp.
- (b) Write the recommended level of illumination in lux for the following areas of an office :
- (i) Reception (ii) Conference room
- (iii) Stairs (iv) Passage
- (v) Inside lift (vi) Cabin of office head
- (c) (i) Give the meaning of flood lighting and flood light projector.
- (ii) It is desired to flood-light the front of a building 42 metre wide and 16 metre high. Projectors of 30° beam spread and 1000 W lamps giving 20 lumen / watt are available. If the desired level of illumination is 75 lm/m² and if the projectors are to be located at ground level 17 metre away, design and show a suitable scheme. Assume the following : Coefficient of utilization = 0.4; Depreciation factor = 1.3; Waste light factor = 1.2.

6. Attempt any TWO of the following :**2 × 6 = 12**

- (a) State general requirements for agriculture and horticulture lighting (three points). Also write down the lamps used for the above two applications for three different situations.
- (b) Describe the working of Thyristor operated dimmer with its diagram.
- (c) A drawing hall 40 m × 25 m × 6 m high is to be illuminated with metal filament gas-filled lamps to an average illumination of 90 lm/m² on a working plane 1 metre above the floor. Estimate suitable number, size and mounting height of lamps. Sketch the spacing layout. Assume coefficient of utilization of 0.5, depreciation factor of 1.2 and space/height ratio of 1.2.

Size of lamps	200 W	300 W	500 W
lm/w	16	18	20

