

17639

21819

3 Hours / 100 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) Figures to the right indicate full marks.
  - (5) Assume suitable data, if necessary.
  - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. (A) Attempt any **THREE** of the following : **12**
- (a) State and describe laws of illumination with figure.
  - (b) Describe working principle and construction of neon lamp with the help of diagram.
  - (c) Explain difference between dimming control and ON/OFF control in lighting control.
  - (d) State the meaning of polar curve and give two application of it.
- (B) Attempt any **ONE** of the following : **06**
- (a) Compare filament lamp and fluorescent lamp on the basis of following :
    - (i) Quality of light
    - (ii) Capital & running cost
    - (iii) Lamp efficiency
    - (iv) Life of Lamp
    - (v) Voltage regulation
    - (vi) Lumen output
  - (b) State the features and advantages of good illumination scheme.

- 2. Attempt any TWO of the following :** **16**
- (a) Describe different methods used for lighting control as energy saving tool.
  - (b) An illumination on the working plane of 75 lux is required in a room 72 m × 15 m in size. The lamp are required to be hung 4 meter above the work bench. Assuming a suitable space height ratio, a utilisation factor of 0.5, lamp efficiency of 14 lumens/watt and maintenance factor 0.8. Estimate the number of lamps, rating of lamp and disposition of lamps.
  - (c) A building 50 m × 15 m is to be illuminated by flood light projector situated 25 m away; if illumination is 100 lux, coefficient of utilization 0.5, depreciation factor 1.5 and waste light factor 1.2. Estimate the number, size and angle of the projector assuming 1000 watts lamp having 17 lumens/watt luminous efficiency.
- 3. Attempt any FOUR of the following :** **16**
- (a) State the specific requirement for (i) Factory Lighting (ii) Sport Lighting
  - (b) Explain the stepwise procedure for designing illumination scheme for commercial unit.
  - (c) A 250 V lamp has a total flux of 1500 lumens and take a current of 0.4 A. Calculate
    - (i) Lumen per watt (ii) M.S.C.P. per watt.
  - (d) Draw and explain typical circuit diagram of LED Lamp.
  - (e) Explain TRIAC operated dimmer for light control.
- 4. (A) Attempt any THREE of the following :** **12**
- (a) State the recommended illumination level required for any four area of residential premises.
  - (b) Explain any four factor that govern the design consideration for industrial premises.
  - (c) State the requirement of illumination scheme for shipyard.
  - (d) Explain with neat sketch the working of HPMV lamp and state its application.
- (B) Attempt any ONE of the following :** **06**
- (a) List the various indoor lighting scheme and describe any two of them.
  - (b) Explain lumens or light flux method for calculation of light.

**5. Attempt any TWO :****16**

- (a) Define the following terms :
- (i) Luminous flux
  - (ii) Utilization factor
  - (iii) Mean Spherical Candle Power (MSCP)
  - (iv) Lamp efficiency
- (b) A floor lighting is to be provided on the front of building of  $40 \text{ m} \times 25 \text{ m}$  for brightness of  $18 \text{ lumens/m}^2$ . The coefficient of reflection of building surface is 0.21. The lamp of 500 W having lumen output 8400 each are used. If beam factor is 0.65, waste light factor is 1.1, maintenance factor 0.85, then calculate number of lamp for flood lighting.
- (c) (i) State the criteria for preferring tungsten filament lamp on operation table in hospital.
- (ii) State the recommended illumination level required for any four areas of hospital lighting.

**6. Attempt any FOUR of the following :****16**

- (a) Explain construction and operation of lamp used for railway platform lighting.
- (b) State any four specific requirement of flood lighting.
- (c) State the purpose of lighting control. Which device is used for this purpose ?
- (d) State any four desirable characteristics of lighting required in aquariums.
- (e) State the general requirement for agriculture and horticulture lighting. State the lamp used for these application.
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