

12148

21112

3 Hours / 100 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions :** (1) All Questions are *compulsory*.
(2) Attempt **all** Questions including Question No. 1 which is *compulsory*.
(3) Answer each next main Question on a new page.
(4) Illustrate your answers with neat sketches wherever necessary.
(5) Figures to the right indicate full marks.
(6) Assume suitable data, if necessary.
(7) Use of Non-programmable Electronic Pocket Calculator is permissible.

- | | Marks |
|---|--------------|
| 1. (a) Attempt any THREE : | 12 |
| (i) Define : | |
| (1) Lamp η | |
| (2) Reflection factor | |
| (3) Utilisation factor | |
| (4) Solid angle | |
| (ii) State and explain laws of illumination. | |
| (iii) Discuss construction and principle of operation of sodium vapour lamps. | |
| (iv) State recommended illumination level required for any four areas of hospital lighting. | |

P.T.O.

(b) Attempt any ONE :**6**

- (i) Explain the working of Neon-lamps with neat diagram. State any one advantage and any one disadvantage.
- (ii) What is meant by dimmer transformer ? What are types available and write its role in illumination control ?

2. Attempt any TWO :**16**

- (a) Workshop 60×15 m by means of lamps mounted 5 m above working plane. The average illumination required is 100 lumen, coeff. of utilization = 0.4, luminous $\eta = 16$ lum/Watt. Assume sphere height ratio of units and depreciation factor = 20 c/s. Find number and wattage of lamp.
- (b) A front building $50 \text{ m} \times 16 \text{ m}$ is illuminated by 16, 1000 W lamps arranged in uniform on surface. Assuming luminous η of 17.4 lumen/watt, coeff. η of utilization of 0.4, Determine illumination on surface, number and size of projectors.
- (c) List out different types of lighting used for interior illumination and explain any one with neat sketches.

3. Attempt any FOUR :**16**

- (a) The illumination of $30 \text{ m} \times 10 \text{ m}$ is to have value of 250 lux. and provided by number of 300 W filament lamp. Assume utilization factor = 0.4, depreciation factor = 0.9. Determine no. of lamps. required if $\eta = 14$ lumen/Watt.
- (b) Explain construction and operation of FTL and compare it with Tungsten filament lamp.
- (c) State the requirement of illuminations scheme for stage lighting.

12148

[3]

- (d) Describe neat sketches of various types of lights fitting used for illumination.
- (e) What are general principles usually employed in design of street lights ? Explain in brief.
- (f) Which types of lamps are used for plants in fresh water aquarium and why ?

4. (a) Attempt any THREE : 12

- (i) Explain with neat sketches working of electronic dimmer used in illumination control.
- (ii) Explain flood lighting in brief. Also write any two applications of this lighting.
- (iii) Compare sodium vapour lamp with energy efficient CFL lamps.
- (iv) Explain principles used in employing design of factory lighting installation.

(b) Attempt any ONE : 6

- (i) What are different types of lighting scheme ? Explain in details.
- (ii) State advantages and disadvantages of discharge lamps over filament lamp and give their application.

5. Attempt any FOUR : 16

- (a) Design illumination scheme for commercial units.
- (b) State advantages of good illumination scheme.
- (c) Explain with neat sketches how two lamps in room are controlled by ON-OFF control.
- (d) Which lamps are used for Malls and Supermarkets and why ?
- (e) State and explain the illumination schemes for agriculture.

P.T.O.

12148

[4]

6. Attempt any FOUR :

16

- (a) List different dimmers used in illumination. Describe any one of them.
 - (b) What are special features of flood lights ?
 - (c) What are design requirement for sports lights ?
 - (d) Describe 3 point lighting techniques used for visual media and still photography.
 - (e) Explain various principles of CFL lamps and state its advantages.
-