17639

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3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) 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**

(i) Define the terms:- Illumination; Light intensity; Lumen and Lux.

(ii) Explain with neat sketch the working of carbon-arc lamp with its applications.

(iii) Explain with circuit diagram; the working of Triac Operated Dimmer ?

(iv) State the purposes of lighting control.

b) **Attempt any ONE of the following:** **6**

(i) State the features and advantages of Good Illumination Scheme.

(ii) Explain with neat sketch; the construction; working principle and applications of metal halide lamp.

Marks

2. Attempt any TWO of the following: **16**

a) Explain with neat sketch the following lighting control circuits :-

(i) Single lamp controlled by single switch

(ii) Single lamp controlled by two point method

(iii) Single lamp controlled by three point method.

(iv) Auto transformer dimmer.

b) An illumination on the working plane of 75 lux is required in a room 72 m × 15 m in size. The lamps 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 lamps and disposition of lamps.

c) (i) State main objectives of street lighting. Explain general principles employed in the design of street lighting.

(ii) Explain the illumination level for street lighting mounting height of lamps in street lighting and types of lamps used for street lighting ?

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

a) A lamp of 500 watts having mscp of 1000 is suspended 2.7 meters above the working plane. Calculate :-

(i) Illumination directly below the lamp at the working plane.

(ii) Lamp efficiency.

b) Draw the typical circuit diagram of LED lamp. State any four applications of LED lamp.

c) What is a polar curve ? How it is useful for designing the lamps.

Marks

d) Select illumination level required as per ISI for the following working plane in residential building -

(i) Kitchen

(ii) Living room

(iii) Dinning room

(iv) Study room

e) State the general requirements for factory lighting.

4. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) Explain with neat sketch the working of Halogen lamp. State its applications.

(ii) What are the factors governing the illuminance of visual task in interior lighting scheme ?

(iii) List the various indoor lighting schemes and describe any one of them with sketch.

(iv) State different types of lamps used for decorative purpose and stage lightings and state the reasons why these lamps are used.

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) Compare incandescent and fluorescent lamps on the basis of:-

(1) Luminous efficiency

(2) Colour rendering

(3) Effect of voltage fluctuation

(4) Life of lamp

(5) Cost

(6) Quality of light

(ii) Explain with neat sketch the working principle advantages; disadvantages and applications of CFL lamp.

Marks

5. Attempt any TWO of the following: **16**

a) State the specific requirements and type of lamps used for the following interior lighting :-

(i) Office building

(ii) Multistoreyed industrial buildings

(iii) Single storeyed without skylight industrial building

(iv) Highbay industrial buildings.

b) State the general and specific requirements of illumination scheme for aquarium and shipyards. State the lamps used for them.

c) What is flood lighting ? State its purposes ? Why it is necessary to have projectors for flood lighting ? State different types of projectors used for flood lighting ?

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

a) Explain in brief requirements of lighting for following places in Hospitals -

(i) Patient's ward

(ii) Operation theatres

b) State the general requirement for agriculture and horticulture lighting. State the lamps used for these application.

c) Explain in brief the general and specific requirements for railway platform lighting and state the lamps used ?

d) State the lamps used for -

(i) Advertisement / Hoardings

(ii) Sport lighting ? State general illumination level in Lux for these places.

e) Explain with neat sketch the working principle of any one type of following lamp ?

(i) Sodium vapour lamp

(ii) Mercury vapour lamp