



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/BOPTM/SEM-3/BO-302/2012-13**  
**2012**  
**LIGHTING & THE EYE**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :

$10 \times 1 = 10$

- i) Human eye is most sensitive to wavelength of
  - a) red region
  - b) yellow-green region
  - c) ultraviolet region
  - d) equally to all wavelengths.
- ii) To describe the colour of daylight
  - a) CT is used
  - b) CCT is used
  - c) CFI is used
  - d) daylight factor is used.



- iii) A gas filled filament bulbs, the gas used is
- a) Oxygen    b) Helium  
 c) Nitrogen                                        d) Ozone.
- iv) Which of the following lamps gives nearly monochromatic light ?
- a) Sodium vapour lamp  
 b) GLS lamp  
 c) Tube light  
 d) Mercury vapour lamp.
- v) Photometer Measures
- a) Luminous Flux  
 b) Luminous Intensity  
 c) Intensity of Illumination  
 d) Brightness.
- vi) The unit of luminous flux is
- a) steradian                                      b) candela  
 c) lumen    d) lux.
- vii) A mercury vapour lamp gives
- a) Pink light                                      b) Yellow light  
 c) Greenish blue light                      d) White light.
- viii) One lumen per square metre is the same as
- a) one lux    b) one candela  
 c) one foot candle                            d) one lumen metre.
- ix) Visible range of electromagnetic radiation is between
- a) 380 — 780 mm                              b) 380 — 780  $\mu\text{m}$   
 c) 4000 Å - 10000 Å                        d) 400 — 7000 nm.
- x) CFL Stands for
- a) Carbon Filament lamp  
 b) Compact Filament lamp  
 c) Carbon Fluorescent lamp  
 d) Compact Fluorescent lamp.



**GROUP - B**

**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

2. a) What is CIE ? 1
- b) What do you mean by CIE standard observer ? 1
- c) Draw the visibility curve of a standard observer for photopic and scotopic vision. 3
3. Draw the photopic and scotopic curve of human eye. Compare between photopic and scotopic vision.
4. Define luminous intensity and its unit.
5. Write one application of each of the following lamps :  
CFL, Mercury lamp, Halogen lamp, Incandescent lamp.

**GROUP - C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

6. a) Discuss on Lux meter sensor.
- b) What is meant by the 'linearity of response' of this sensor ?
- c) Why is colour correction and cosine correction necessary for a Lux meter sensor ?
- d) Briefly discuss on Isolux diagram.
- e) What do you mean by Purkinje effect ?

$3 + 2 + 4 + 3 + 3$



7. Describe different types of glare and their significance in everyday life. How they may be reduced in practice ? 7 + 8
8. a) Write *one* use of each of the following :  
Sodium lamp, Mercury lamp, Halogen lamp, Incandescent lamp.
- b) What is daylight ? What are its components ?
- c) Write a short description on Eye Protectors.
- ( 4 × 1 ) + ( 2 + 2 ) + 7
9. a) What are the lamp selection parameters ?
- b) Discuss the necessity of a SPD curve.
- c) What is colour rendering index ( CRI ) ?
- d) What do you mean by correlated colour temperature ( CCT ) ?
- e) For a lamp with CRI 80% and CCT 6500 K what is the statement ? 3 + 2 + 3 + 3 + 4
10. With labeled diagram write the construction and working of LB photometer. 4 + 6 + 5
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