Name :	
Roll No. :	A Annual O'X second of part Section
Invigilator's Signature :	

#### CS/B.OPTM/SEM-3/BO-302/2011-12

## 2011

## **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 any *ten* of the following :

 $10 \times 1 = 10$ 

- i) Incandescent lamp has
  - a) asymmetrical polar curve
  - b) symmetrical polar curve
  - c) both (a) and (b)
  - d) none of these.
- ii) Lux meter comprises
  - a) photodiode
- b) photomultiplier tube
- d) either (a) or (b).
- iii) Light meter measures

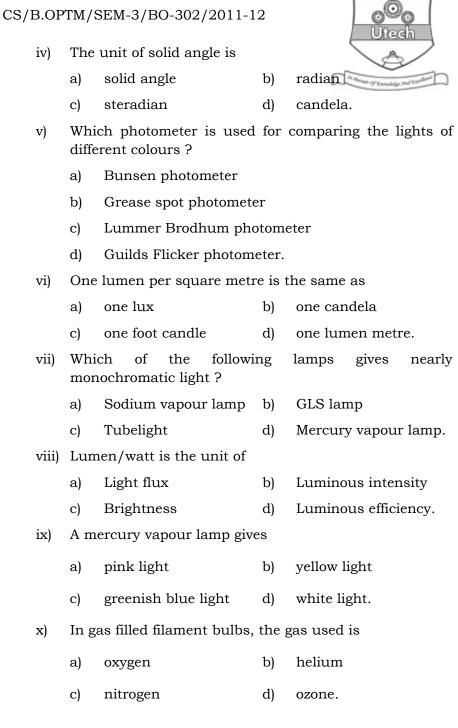
c)

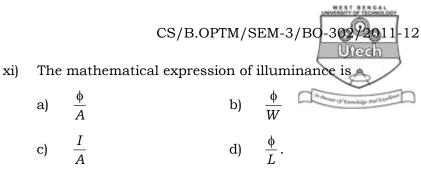
a) intensity of illumination

photovoltaic cell

- b) luminance
- c) luminous intensity
- d) luminous flux.

[ Turn over





GROUP – B

#### (Short Answer Type Questions)

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

- 2. Give a brief description of Photodiode.
- 3. Obtain the relation between lumen and watt.
- 4. Write a brief description of the various components of an incandescent lamp with the help of a labelled diagram.
- 5. Write on CIE standard observer briefly.

# GROUP – C ( Long Answer Type Questions )

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

- 6. a) Define luminance and luminous emittance with their SI units.
  - b) Write down the construction and working of photovoltaic cell.
  - c) A point source of light of 100 cd is placed inside the sphere of diameter 0.5 m. The material of the sphere has 25% absorptance. Find luminous emittance and luminance.
- 7. a) Compare between incandescent and discharge lamps.
  - b) Write the properties of a good filament material.
  - c) How does discharge lamp generate light energy ?
  - d) Discuss daylight factors. 3 + 3 + 4 + 5

3

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### CS/B.OPTM/SEM-3/BO-302/2011-12



- Discuss luminaries and their design. Explain the concept of "lighting system management" and your reasons for choice of lighting equipment.
- 9. a) What is a Lambertian surface ?
  - b) For a flat perfect diffuser derive the following relations :
    - i)  $\phi = \pi \times I N$
    - ii)  $M = \pi \times L$
    - iii)  $L = \frac{P \times E}{\pi}$

where these symbols have their own meaning.

c) What is the meaning of I.P. Code ? Explain why it is important for indoor luminaire selection. 1 + 10 + 4

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