

# I-B-OPTOM-SEM-I: WINTER-2017

## SUBJECT: BASIC OPTICS

**Note:** Section A is given on a **SEPARTE** sheet and has to be answered on the same sheet. This sheet should be completed within first **30** minutes of the starting of examination. This sheet with Section A only will be collected by the Supervisor.

Seat No: \_\_\_\_\_

W-2017-3468

Day: Tuesday  
Date: 28-11-2017

### SECTION-A

**Q.1** Fill in the blanks: **(10)**

- 1) The RI of polycarbonate lens material is \_\_\_\_\_.
- 2) Abbe value of CR-39 is \_\_\_\_\_.
- 3) Pin cushion distortion is seen in \_\_\_\_\_ types of lenses.
- 4) By sign convention all distances are measured from \_\_\_\_\_.
- 5) Lensometer measures \_\_\_\_\_ power of a lens.
- 6) When an object is seen through the prism, it appears to be shifted towards \_\_\_\_\_ of the prism.
- 7) \_\_\_\_\_ lens is thicker at center and thinner at periphery.
- 8) With the help of Geneva lens measure, we can measure the \_\_\_\_\_ of the lens.
- 9) In thin lens we see \_\_\_\_\_ number of cardinal points.
- 10) Focal length of + 16.00 D lens is \_\_\_\_\_ cm.

**Q.2** Match the following: **(10)**

- | <b>A</b>                       | <b>B</b>                              |
|--------------------------------|---------------------------------------|
| 1) Fiber Optics                | a) 620 to 750 nm                      |
| 2) Refractive Index of air     | b) Sag Value                          |
| 3) Refractive Index of vacuum  | c) Diopter                            |
| 4) Geneva lens Measure         | d) 450 to 495 nm.                     |
| 5) Polycarbonate               | e) Total Internal Reflection          |
| 6) Magnification               | f) 1.000292                           |
| 7) Lens Unit                   | g) U.V. Protection                    |
| 8) Wave length of Red Colour   | h) 495 to 570 nm.                     |
| 9) Wave length of Green Colour | i) 1.0000                             |
| 10) Wave length of blue Colour | j) Ratio of Image size to object size |

**Signature of the Invigilator**

**Signature of the Examiner**

**Total Marks Obtained**

**I -B.OPTOM. SEM – I : WINTER - 2017**

**SUBJECT: BASIC OPTICS**

**Day:** Tuesday  
**Date:** 28/11/2017

**Time:** 10.00 AM TO 01.00 PM  
**Max. Marks:** 70

**W-2017-3468**

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**N.B:**

- 1) There are **THREE** sections as  
**Section-A** = Objective type questions = 20 marks  
**Section-B** = Long questions = 20 marks  
**Section -C** = Short questions = 30 marks
  - 2) **Section- A** is given on a **SEPARATE** sheet and has to be answered on the same sheet.
  - 3) **Section-B** has 3 Long questions and **ANY TWO** questions have to be answered on the **SEPARATE** answer sheet.
  - 4) **Section-C** has short questions and **ANY FIVE** questions have to be answered on the **SEPARATE** answer sheet.
  - 5) Draw neat labeled diagrams **WHEREVER** necessary.
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**SECTION-B**

**Q.3** Answer **ANY TWO** of the following: **(20)**

- 1) Write in detail about color theories.
- 2) Classify monochromatic aberrations and differentiate between spherical and coma aberration.
- 3) What is photometer? Explain working principle and uses of Lummer Brodhum photometer with diagram.

**SECTION-C**

**Q.4** Answer **ANY FIVE** of the following: **(30)**

- 1) What is effective power? Explain role of effectivity in plus and minus lenses with example.
- 2) Define critical angle, Huygen's principle and SHM.
- 3) Write a short note on sign conventions with diagram.
- 4) Explain Galilean telescope with diagram.
- 5) The vergence of light at point A is + 8.00 D. What is the vergence at point B, which is 5 cm downstream from A.
- 6) Differentiate between:
  - i) Lens and Mirrors
  - ii) Convex and Concave lenses