REV-01
BOP/15/20

2025/05

SET A

BACHELOR OF OPTOMETRY
SECOND SEMESTER
PHYSICAL OPTICS
BOP-201

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 1hr. 30 mins. **Full Marks: 35**

Objective

Time: 15 mins. **Marks: 10**

Choose the correct answer from the following: ***1×10=10***

1. What is the direction of propagation of Electromagnetic wave?
   a. Same as the direction of Electric field
   b. Same as the direction of Magnetic field
   c. Perpendicular to both Electric & Magnetic field
   d. Parallel to both Electric & Magnetic field

2. Green light has a wave length 525 nm. What will be the energy for the green light in joules?
   a. 3.78×10^{-19} J
   b. 2.78×10^{-19} J
   c. 3.0×10^{-19} J
   d. 3.2×10^{-19} J

3. According to the planks theory, how energy(E) vary with frequency(ν)?
   a. $E \propto \nu^2$
   b. $E \propto 1/\nu^2$
   c. $E \propto \nu$
   d. $E \propto 1/\nu$

4. At what angle does the Brewster's low state that light is completely polarized?
   a. 30^0
   b. 45^0
   c. 90^0
   d. 60^0

5. Which of the following is a characteristic of Fresnel diffraction?
   a. Parallel light
   b. Diverging light
   c. Converging light
   d. Spherical wave front

6. How does the intensity of Rayleigh scattering vary with wavelength?
   a. $I \propto 1/\lambda$
   b. $I \propto \lambda$
   c. $I \propto 1/\lambda^4$
   d. $I \propto 1/\lambda^2$

7. What is the primary principle of Holography?
   a. Interference of light waves
   b. Diffraction of light waves
   c. Reflection of light waves
   d. Refraction of light waves

8. Which of the following is a characteristic of laser light?
   a. Incoherent & divergent
   b. Coherent & divergent
   c. Coherent & collimated
   d. Incoherent & collimated

9. Which of the following types of Electromagnetic Radiation is used for heating Effect?
   a. Ultraviolet Radiation
   b. Infrared Radiation
   c. Gamma rays
   d. X-rays

10. What is the primary advantage of holography?

a. Creating 2D images

b. Recording and reconstructing of 3D image

c. Enhancing image brightness

d. Reducing image noise

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Descriptive

Time : 1 hr. 15 mins. **Marks : 25**

[Answer question no.1 & any two (2) from the rest]

1. a) Calculate the energy of photon in eV whose frequency is 6×10^{-20} Hz. 2+3=5
   b) Explain the postulates of planks theory of light including mathematical formulation.

2. a) Explain Raman scattering. Define stocks and anti-stocks lines spectrum with diagram. 5+5=10
   b) Compare the contrast ultraviolet (UV) radiation and x-rays.

3. a) What is population inversion, and how is it achieved through pumping in laser system? 4+4+2=10
   b) Explain the construction of optical fiber.
   c) Write two medical applications of optical fiber.

4. a) Derive the expression for bright & dark fringes in Young double slits experiment. 5+5=10
   b) Write the difference between Fresnel & Fraunhoffer type of diffraction.

5. Define holography. Describe the process of construction & re-construction of hologram with an appropriate diagram. 10

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