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(26) **SARDAR PATEL UNIVERSITY**

M. Sc. Integrated Biotechnology Examination, First Semester
Saturday, 18th April 2015
10:30 a.m. to 1:30 p.m.
PS01CIGB01: Physics- I

Total Marks: 70

Note: 1) All the Questions are compulsory.
2) Figures on the right indicate marks.

Q.1 Choose the correct option. **[8]**

1 U. V rays were discovered by _____.
(a) J. W Ritter (b) W. Roentgen (c) P. Villard (d) M. Herchel

2 _____ is the phenomenon in which two waves superimpose to form a resultant wave of greater or lower amplitude.
(a) Diffraction (b) Interference (c) Dispersion (d) Polarization

3 Spherical aberration can be removed by using _____.
(a) convex lens (b) concave lens
(c) plano convex lenses (d) cylindrical lenses

4 The power of a convex lens having 10 m focal length is _____ diopter.
(a) 0.01 (b) 0.1 (c) 1 (d) 10

5 The optical fibers are based on the principle of _____.
(a) interference (b) diffraction (c) polarization (d) total internal reflection

6 A hologram is a _____ dimensional image of an object.
(a) one (b) two (c) three (d) four

7 Orbital quantum number determines the _____ of the electron orbit.
(a) shape (b) orientation (c) position (d) size

8 Photoelectric effect was first observed by _____.
(a) compton (b) Hertz (c) Thomson (d) de Broglie

Q.2. Answer the following questions. (Any seven) **[14]**

1 State the Brewster's law.
2 Define diffraction. State types of diffraction.
3 Give the principle of Superposition for light waves.
4 Define Power of Lens and give its unit.
5 Enlist the methods to remove Astigmatism in lens.
6 Define spontaneous and stimulated emission of radiation.
7 Define Numerical Aperture of fibre.
8 State applications of X-ray.
9 State Heisenberg's uncertainty principle.

(PTO)

Q.3 (a) Explain the construction and working of Newton's ring experiment **[6]**

(b) Give in detail the construction and working of Fresnel's biprism experiment. **[6]**

OR

(b) **(i)** State and explain Malu's law. **[3]**

(ii) With a slab of flint glass, the angle of polarization is found to be $62^0\ 24'$. Calculate the refracting index of the flint glass. **[3]**

Q.4 (a) Explain in detail the Cardinal Points of co-axial system of lenses. **[6]**

(b) Define chromatic aberration. Also explain longitudinal and lateral chromatic aberration in lens. **[6]**

OR

(b) Derive an expression for the deviation produced by thin lens. **[6]**

Q. 5 (a) Write a note on Ruby Laser. **[6]**

(b) Give an account on the structure and classification of Optical fibres **[6]**

OR

(b) Describe the recording of hologram and reconstruction of image from hologram. **[6]**

Q. 6 (a) Explain the Modern Coolidge tube method for production of X-rays. Also state properties of X-rays. **[6]**

(b) Explain the characteristics of photoelectric effect in detail.

OR **[6]**

(b) **(i)** Write a note on absorbtion spectra. **[3]**

(ii) Lithium has a work function of 2.3eV. It is exposed to light of wavelength 4.8×10^{-7} m. Find the maximum kinetic energy with which the electron leaves the surface. **[3]**

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