[64/A-95]

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SARDAR PATEL UNIVERSITY
M. Sc. Integrated Biotechnology Examination, First Semester
Tuesday, 29th March 2016
2:30 p.m. to 5:30 p.m.
PS01CIGB01: Physics- I

Maximum Marks: 70

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

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

1 The X-radiations were discovered by _____.
(a) P.Villard (b) J.W. Ritter (c) W. Roentgen (d)M. Herschel
2 Newton's ring illustrate the phenomenon of
(a) interference (b) diffraction (c) polarization (d) none of these
3 An image is formed by a convex lens due to the process of _____.
(a) interference (b) polarization
(c) refraction (d) diffraction
4 A convex lens is called _____.
(a) Converging lens (b) diverging lens
(c) both converging and diverging lens (d) refracting lens
5 Which of the following is not the property of LASER?
(a) coherence (b) polychromaticity (c) high directionality (d) extreme brightness
6 In optical fiber outer cladding is_____ the inner core.
(a) less dense than (b) denser than (c)the same density as (d) unpredictable
7 The uncertainty principal was given by _____.
(a) De-broglie (b) Heissenberg (c) Pauli (d) Davisson and Germer
8 Which of the following property of an anode should be high?
(a) Thermal conductivity (b) atomic weight
(c) melting point (d) all of the above

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

1 State types of diffraction.
2 State Brewster's law.
3 Enlist the types of lenses.
4 Define power of lens and give its unit.
5 Write applications of optical fiber communication.
6 Define Numerical Aperture of a fiber cable.
7 Enlist quantum numbers used to describe state of an electron.
8 State Bragg's law for X-rays diffraction.
9 Give the applications of X-rays

(P T O)

Q.3(a) Explain the construction and working of Fresnel's biprism experiment. **[06]**

(b) Derive an expression for the resolving power of prism. **[06]**

OR

(b) (i) Write a short note on polarization of light. **[03]**

(ii) Calculate the refracting index of the flint glass whose angle of polarization is found to be $62^0 24'$. **[03]**

Q.4 (a) Write a note on Cardinal points of an optical system of lenses. **[06]**

(b) List the type of aberrations. Discuss chromatic aberrations in lens system. **[06]**

OR

(b) (i) Give comparison between Ramsden and Huygen eyepiece. **[03]**

(ii) Determine the focal length of a lens with power of 20 D. **[03]**

Q.5(a) Explain the construction and working of He-Ne Laser. **[06]**

(b) Discuss the structure and classification of optical fibers. . **[06]**

OR

(b) (i) Give the basic principal of Holography. **[03]**

(ii) Determine the numerical aperture of a step index fiber with the core refractive index $n_1 = 1.5$ and the cladding refractive index $n_2 = 1.48$. **[03]**

Q.6 (a) What is photoelectric effect? Explain the characteristics of photoelectric effect. **[06]**

(b) Explain in detail the Modern Coolidge tube method for the production of X-rays. **[06]**

OR

(b) (i) Find the energy of a photon having wavelength 700 nm. **[03]**

[Given: $c = 3 \times 10^8$ m/s, $h = 6.62 \times 10^{-34}$ J-s]

(ii) State and explain Pauli's exclusion principle. **[03]**

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