

(24) Seat NO: \_\_\_\_\_

No. of Printed Pages: 02

**SARDAR PATEL UNIVERSITY**  
M. Sc. Integrated Biotechnology Examination, First Semester  
Monday, 17<sup>th</sup> October 2016  
10:00 a.m. to 1:00 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.

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- The range of Visible rays is \_\_\_\_\_ Å.  
(a) 400-1000 (b) 100-4000 (c) 700- 4000 (d) 4000- 7000
- Prism is used to study the spectra by the process of \_\_\_\_\_.  
(a) Diffraction (b) reflection (c) refraction (d) interference
- There are \_\_\_\_\_ cardinal points in a co-axial system with medium surrounding the optical system being same.  
(a) 2 (b) 4 (c) 6 (d) 8
- The focal length of a lens with power 10 diopter is \_\_\_\_\_ m.  
(a) 0.01 (b) 0.1 (c) 1 (d) 10
- The optical fibers are based on the principle of \_\_\_\_\_.  
(a) interference (b) diffraction (c) polarization (d) total internal reflection
- Hologram is a \_\_\_\_\_ dimensional representation of an object.  
(a) 1 (b) 2 (c) 3 (d) 4
- Total number of electrons in M-shell is \_\_\_\_\_.  
(a) 2 (b) 8 (c) 18 (d) 32
- The uncertainty principle was stated by \_\_\_\_\_.  
(a) Heisenberg (b) Bragg (c) De-Broglie (d) Laue

Q.2. Attempt any Seven of the following:

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- State the principle of Superposition for light waves.
- Define positive and negative crystals.
- What is Rayleigh's criterion?
- Define Power of Lens and give its unit.
- Give comparison between Huygen's eyepiece and Ramsden's eyepiece.
- State properties of LASER.
- Calculate the Numerical Aperture of fibre with  $n_1=1.5$  and  $n_2 = 1.48$ .
- State Pauli's exclusion principle.
- What is L-S and j-j coupling?

(P.T.O.)

①

- Q.3 (a) Discuss the formation of Newton's ring for reflected rays. 6  
(b) Give the construction and working of Fresnel's biprism experiment. 6  
OR  
(b) State and explain Brewster's law. With a slab of flint glass, the angle of polarization is found to be  $62^{\circ} 24'$ . Calculate the refracting index of the flint glass. 6
- Q. 4 (a) Explain in detail all the Cardinal Points of co-axial system of lenses. 6  
(b) Write a note on spherical aberration in lens. Discuss methods for its elimination. 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 the structure and classification of Optical fibers. 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. 6  
(b) State and explain the Bragg's Law of X-ray diffraction. Calculate the angle of diffraction of first order for NaCl crystal with  $d=2 \text{ \AA}$  and  $\lambda=1.54 \text{ \AA}$ . 6  
OR  
(b) Explain the characteristics of photoelectric effect in detail. 6

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