

**First Year B.Sc Optometry Degree Supplementary Examinations April 2017**  
**Physics & Chemistry**  
**(2014 Scheme)**

Time: 3 hrs

Max marks: 80

- Answer all questions
- Write section A and section B in separate answer books (32 Pages). Do not mix up questions from section A and section B.

**Q P Code: 115013****Section A – Physics****Marks: 40****Essay:****(10)**

1. Explain the term cardinal points with reference to a coaxial system. What are nodal points and nodal planes. Give their properties. Show that the nodal planes are planes of unit angular magnification.

**Short notes:****(3x5=15)**

2. What are monochromatic aberrations. Explain first order theory.
3. What is the advantage of using matrix method in paraxial optics. Obtain the system matrix for a general optical system.
4. What are the essential components of a laser. Explain their functions briefly.

**Answer briefly:****(5x2=10)**

5. Mention the use of cylindrical lens and contact lenses.
6. Using ray theory, describe the mechanism of transmission of light within an optical fibre.
7. Distinguish between Raman scattering and Rayleigh scattering.
8. Obtain an expression for the resolving power of a prism.
9. Nonreflecting films.

**Fill in the blanks:****(5x1=5)**

10. A ..... polarized light wave is a wave in which the electric vector oscillates in a given constant orientation.
11. The polarizing angle is also known as ..... angle.
12. Crystals that exhibit selective absorptions are .....
13. A Nicol prism is made from ..... crystal.
14. A ..... mode fibre has a smaller core diameter and can support only one mode of propagation.

**Q P Code: 116013****Section B – Chemistry****Marks: 40****Essay:****(10)**

1. What is meant by hybridization. In terms of hybridization discuss the shapes of methane, ethane and ethyne.

**Short notes:****(3x5=15)**

2. Explain the optical nature of tartaric acid
3. What happens when benzene is treated with
  - $\text{Cl}_2$  in the presence of  $\text{FeCl}_3$
  - Mixture of  $\text{Con H}_2\text{SO}_4$  and  $\text{Con HNO}_3$  at 330K
  - $\text{Con H}_2\text{SO}_4$  at 330K
4. What is meant by inversion of cane sugar. How glucose does reacts with phenyl hydrazine.

**Answer briefly:****(5x2=10)**

5. What is meant by Rf value. What is its use in chromatography.
6. Name the vitamin whose deficiency causes: xerophthalmia, beriberi, scurvy, pernicious anemia
7. What is a buffer solution. What are different types of buffer solutions.
8. The applications of emulsions.
9. The preparation of sulpha acetamide.

**Fill in the blanks:****(5x1=5)**

10. The co-enzyme form of thiamine is .....
11. The hydrolysis products of sucrose are ..... and .....
12. The stereo isomers which are non-super imposable and do not bear mirror image relationship are called .....
13. In paper chromatography stationary phase is .....
14. Vitamin A is otherwise called .....

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