

DISCIPLINE SPECIFIC (CORE) COURSE
Semester-V

HSC520C2: PHYSICAL SCIENCES

(CREDITS: THEORY-4, PRACTICAL-2)

THEORY (4 CREDITS)

SECTION: A – CHEMISTRY

Unit 1 Solutions, Acids and Bases

- Introduction to: solute , solvent and solution
- Types of solutions, colloids, its classification
- properties, Definition of sols, gels and suspension and their properties, emulsion and its types
- Concept of acid, base and salt, neutralization reaction, pH and pH scale, buffer solutions

Unit 2 Redox Reaction and Household chemicals

- Basic concept of oxidation and reduction
- Household Chemicals
 - Chemicals in foods-preservatives and colourants
 - Antiseptics and disinfectants
 - Soaps and detergents

SECTION –B: PHYSICS

Unit 3 Motion, Gravity and Heat transfer

- Measurements of Physical Quantities- Units and dimensions.
- Different types of motions, Laws of motions and examples.
- Gravity and Gravitation.
- Work, Power and Energy.
- Temperature and its measurements.
- Calorimetry, change of state with applications.
- Heat Transfer- modes and examples.

Unit 4 Light and Vision

- Refraction , Reflection
- Diffusion of light.
- Normal vision
- Defects of vision
- Concept of current , voltage and resistance – Ohm’s Law

PRACTICAL

Section A: CHEMISTRY

1. Preparation of standard solutions
2. Determination of pH of different solutions
3. Volumetric analysis
 - a. Titration of strong acid vs strong base (Acid-base titration)
 - b. Titration of potassium permanganate vs Mohr’s salt (Redox titration)

Section B: PHYSICS

1. Determination of the volume of the given body using Vernier Callipers.
2. Verify principle of moments and to determine the weight of unknown body using a lever.
3. Comparison of thermometric scales of temperature using graph method.
4. Determination of focal length of double convex lens by one pin method.
5. Repair and testing of electric iron and fuse.
6. Reflection of light by using mirror strip
7. Refraction of light by using glass slab

Recommended readings

1. ArunBahl and B. S. Bahl : 2010, Advanced Organic Chemistry, S. Chand
2. T.Jacob, 1979, Textbook of Applied Chemistry by McMillan India Ltd.
3. Puri, Sharma and Pathania, 2008, Principles of Physical Chemistry by Vishal Publishing House.
4. Ahluwalia, V. K., Dhingra, S., Gulati, A., 2005, College Practical Chemistry University Press India Pvt. Ltd .
5. B.Sc. Practical Physics by Harnam Singh, S.Chand and Co, 2001.
6. Lal, S. (1995). Fundamentals Physics, Pradeep Publications, Delhi.
7. Peet, L.J., Pickett, M.S. & Arnold, M.G. (1979). Household Equipment, John Wiley andSons, USA.
8. Partab, H. (1987). Electrical Gadgets, DhanpatRai& Sons.
9. Sharma, S.K. &Jerath, R. (2013). Dinesh New Millenium Physics. Vol. I and Vol. II.Khan, N. (2008). Physics. Oxford University Press.