

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2023
(Third Semester)

Branch – CHEMISTRY

INORGANIC CHEMISTRY -III

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. X-ray diffraction can be observed by using
(i) Diffraction Grating (ii) Rock salt crystal
(iii) convex lens (iv) Michelson's interferometer
2. What is clathrates?
(i) Methane gas trapped in ice (ii) liquid gold
(iii) Process of mixing gold and copper (iv) None of these
3. Which leaves no track on Wilson cloud chamber?
(i) Electrons (ii) Protons (iii) α - particles (iv) Neutrons
4. When a radioactive substance is subjected to a vacuum, the rate of disintegration per second
(i) increases only if the products are gaseous
(ii) increase considerably
(iii) decreases
(iv) is not affected
5. Positron emission involves the ejection of
(i) an alpha particle (ii) a beta minus particle
(iii) a beta plus particle (iv) a proton and a neutron.

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a) Write the principles of Electron diffraction.
OR
b) Draw and explain the structure of diamond.
7. a) Define : Hume Rothery ratio and super lattice.
OR
b) Explain the Band theory of semi conductors.
8. a) What are Stable and unstable sub atomic particles?
OR
b) Write note on : Threshold energy.

Cont...

9. a) How will you determine radioactive emanation by cloud chamber?
OR
b) Describe scintillation counter method of photon collection.
10. a) Explain about atom bomb.
OR
b) What are fissile and fertile isotopes?

SECTION -C (30 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks (5 x 6 = 30)

11. a) Derive Bragg's equation.
OR
b) Distinguish between X-ray, neutron and electron diffraction.
12. a) Discuss the free electron theory of metallic bond.
OR
b) Highlight Schottky and Frenkel defect.
13. a) Give a brief account of mass defect and binding energy.
OR
b) Outline with neat sketch of liquid drop nuclear model.
14. a) Explain multiplicative ion collection by G.M.Counter.
OR
b) Summarize the principle and application of cyclotron.
15. a) Write the types and classification of nuclear reactors.
OR
b) Explain about the transmutation by α - particles.

Z-Z-Z

END