

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2018
(Third Semester)

Branch-CHEMISTRY

INORGANIC CHEMISTRY - III

Time : Three Hours

Maximum : 75 Marks

Answer **ALL** questions

ALL questions carry **EQUAL** marks (5 x 15 = 75)

- 1
 - a Describe the structure of zinc blende. (5)
 - b How are X-rays generated? (4)
 - c Discuss the principles of electron diffraction. How is it useful for structural elucidation of compounds? (6)

OR

 - d Discuss briefly the application of X-ray diffraction. (5)
 - e Discuss briefly the structure of graphite. (4)
 - f Discuss briefly the experimental method and application of neutron diffraction in the structural elucidation of compounds. (6)

- 2
 - a Discuss briefly the structure and applications of metal cluster compounds with suitable examples. (7)
 - b Explain briefly the importance of Hume-Rothery ratio. (4)
 - c What are semiconductors? How are they classified? Explain them. (4)

OR

 - d Discuss briefly the band theory on solids. (7)
 - e What are crystal defects? How are they classified? Explain Schottky and Frenkel defects. (6)
 - f What is metallic bond? Give one example. (2)

- 3
 - a Discuss briefly the mass defect and binding energy. (6)
 - b Describe the properties of nucleus. (4)
 - c Discuss in details the Meson field theory. (5)

OR

 - d Explain the Liquid drop model and its importance. (5)
 - e What is atomic mass? How is it measured? (5)
 - f What is Fermi gas model? Explain briefly. (5)

- 4
 - a Discuss the principle and working of G.M Counter. (6)
 - b Explain the characteristics of α , β and γ rays. (5)
 - c What is Cherenkov counter? Explain. (4)

OR

 - d Discuss briefly the principle and working of cyclotron. (5)
 - e Discuss briefly the principle and working of scintillation counter. (5)
 - f Describe briefly the importance of cloud chamber. (5)

- 5
 - a Explain the principle and applications of isotopic dilution analysis. (6)
 - b What are fissile and fertile isotopes? Explain with suitable examples. (4)
 - c What is meant by nuclear transmutation? Explain briefly the nuclear transmutation brought out by alpha particles. (5)

OR

 - d Discuss briefly the principle of atom bomb. (5)
 - e Describe briefly the preparation of transuranic elements. (4)
 - f What is a nuclear reactor? Mention their types. Explain them. (6)