

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2018
(First Semester)

Branch - **CHEMISTRY**

GENERAL CHEMISTRY -1

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10x1 = 10)

Choose the best answer:

Magnetic quantum number m is given by

- (i) $m=2h+1$ (ii) $m=2l+1$
(iii) $m=2n+1$ (iv) $m=l/2$ & $-l/2$

de Broglie equation λ is equal to

- (i) $2h/mv$ (ii) nh/mv
(iii) h/mv (iv) h/mv

- 3 On moving down a group of the periodic table
(i) the nuclear charge decreases (ii) Ionization energy decreases
(iii) Ionization energy increases (iv) the atomic size decreases
- 4 On moving from left to right in the periodic table the ionic radius of an element
(i) increases (ii) decreases
(iii) remains the same (iv) first decreases and then increases
- 5 High boiling point of water is due to the formation of _____ bonds.
(i) ionic (ii) covalent
(iii) covalent & hydrogen bonding (iv) vander waal's force
- 6 If two atoms approach each other, a bond is formed. When the potential energy
(i) Increases (ii) Decreases
(iii) Remaining unchanged (iv) None of the above
- 7 Which shows a bond order of one
(i) H_2 (ii) N_2
(iii) O_2 (iv) He_2
- 8 Which of the following cannot exist on the basis of molecular orbital theory?
(i) H_2^+ (ii) He_2^+
(iii) He_2 (iv) O_2
- 9 Hybridization involves
(i) addition of an electron pair (ii) mixing up of atomic orbitals
(iii) removal of an electron pair (iv) separation of electron pair
- 10 Which of the following is a strongest acid?
(i) Acetic acid (ii) Chloroacetic acid
(iii) Trichloro acetic acid (iv) Trifluoro acetic acid

SECTION - B (25 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 5 = 25)

11 a State the postulates of Bohr's theory.

- 12 a Describe the applications of electro negativity.
OR
b Explain why the radius of a cation is smaller and that of anion is larger than that of the corresponding atom.
- 13 a Bring out the general characteristics of Ionic compounds.
OR
b Explain Fajan's rules.
- 14 a Explain why O₂ is paramagnetic where as N₂ is diamagnetic.
OR
b Explain Inert-pair effect.
- 15 a Explain the differences between intermediate and transition state.
OR
b Compare the basic nature of amines and Ammonia by inductive effect.

SECTION -C 140 Marks!

Answer ALL questions
ALL questions carry EQUAL Marks (5 x 8 = 40)

- 16 a Discuss the experimental verification of deBroglie relation.
OR
b Discuss Photoelectric effect, Black body radiation and Compton effect.
- 17 a Discuss the variation of atomic radius and electron affinity in the periodic table with suitable examples.
OR
b What is meant by Ionization energy? Explain its trend in periodic table.
- 18 a Explain the formation of Sodium Chloride. Calculate net energy change by Born-Haber Cycle calculation.
OR
b Explain the hydrogen bonding, its types and applications.
- 19 a Compare VBT and MOT.
OR
b Explain the formation of N₂ and O₂ molecule by molecular orbital theory.
- 20 a i) What are free radicals? Discuss their formation with examples. (5+3)
ii) Explain electrophiles with examples.
OR
b i) Explain the structure of Ethylene with the help of hybridization. (5+3)
ii) What are Carbenes? Explain.