

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2019
(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 (10 x 1 = 10)

Bragg equation is

- (i) $n\lambda = d \sin \theta$ (ii) $n\lambda = 2d \sin \theta$
(iii) $n\lambda = 2d \cos \theta$ (iv) $n\lambda = 2d \sin^2 \theta$

Heisenberg's uncertainty principle

- (i) $\Delta x \cdot \Delta p = \frac{h}{4\pi}$ (ii) $\Delta x \cdot \Delta p = \frac{4\pi h}{1}$
(iii) $\Delta x \cdot h = 4\pi \cdot \Delta p$ (iv) $\Delta x \cdot \Delta p = \frac{h}{4\pi}$

3 Percentage ionic character of a covalent bond depends upon

- (i) atomic radii (ii) ionic radii
(iii) electro negativity (iv) ionization energy

4 Transition elements as the general e^{nic} configuration.

- (i) $ns^2 np^6$ (ii) $(n-1)d^{1-10} ns^{1-2}$
(iii) $(n-1)p^6 ns^{1-2}$ (iv) $(n-1)d^{1-10} ns^2$

5 Electrovalent compounds have

- (i) low melting point and boiling point (ii) high melting point and low boiling point
(iii) low melting point and high boiling point (iv) high melting point and boiling point

6 Ionic bond is favoured for having ___ value of ionization potential and _____ value of electro negativity.

- (i) Low, High (ii) Low, Low
(iii) High, Low (iv) High, high

7 When two atomic orbitals combine, they form

- (i) one molecular orbital (ii) two molecular orbitals
(iii) three molecular orbitals (iv) four molecular orbitals

8 Which of the following can not exist on basis of MOT?

- (i) H_2^+ (ii) He_2^+
(iii) He_2 (iv) C_2

9 Carbon-carbon bond in acetylene consists of

- (i) one σ & 2 π bonds (ii) 2 σ & 3 π bonds
(iii) 2 σ & 2 π bonds (iv) 1 σ & 1 π bonds

10 Trifluoro acetic acid is the strongest acid because of _____ of fluorine

- (i) Large size (ii) High electronegativity

SECTION - B (25 Marks)

Answer ALL questions

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

- 11 a Derive de Broglie equation.
OR
b Explain the photoelectric effect on the basis of quantum theory.
- 12 a Write down the variation of Ionisation of Energy in the periodic table.
OR
b The electronegativity difference of the elements in HF is 1.9. Calculate the percent ionic character of the H - F bond.
- 13 a What are the factors influencing the formation of ionic bond?
OR
b Write down the importance of Hydrogen bonding.
- 14 a Give the differences between bonding molecular orbital and antibonding molecular orbital.
OR
b Discuss the formation of covalent bond by atomic orbital overlap concept.
- 15 a Explain the acidic nature of phenol on the basis of resonance effect.
OR
b State and explain hyper conjugation effect.

SECTION -C (40 Marks)

Answer ALL questions

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

- 16 a Explain Bohr's theory and the origin of hydrogen spectrum. What are its limitations?
OR
b Explain the terms principal quantum number, magnetic quantum number and spin quantum number with significance.
- 17 a Define electronegativity. Explain Paulings and Mulliken's approach.
OR
b What is chemical periodicity? Discuss the application in explaining the chemical behaviour.
- 18 a Explain the polarity of a covalent bond. What are the factors determines the percent ionic character of a polar bond?
OR
b Write notes on Ionisation energy, electron affinity and their periodical variation.
- 19 a Explain the formation of CO by MOT.
OR
b What is VBT? Explain.
- 20 a i) What are electrophiles and nucleophiles. Give example.
ii) Write down any one reaction for each.
OR
b i) By the help of hybridization explain the geometry of methane and ethylene.
ii) What are free radicals?