

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2019
(Third Semester)

Branch-BOTANY

CHEMISTRY -1

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 x 1 = 10)

- 1 The bond angle of SF₆ molecule is
(i) 60° (ii) 90° (iii) 120° (iv) 180°
- 2 Which is the best reducing agent?
(i) F- (ii) Cr
(iii) Br (iv) F
- 3 Identify a pyridine alkaloid
(i) coniine (ii) morphine
(iii) atropine (iv) ephedrine
- 4 Synthetic silk known as viscose rayon is
(i) cellulose nitrate (ii) regenerated starch
(iii) regenerated cellulose (iv) cellulose acetate
- 5 De-ionized water may be obtained by the use of
(i) partition chromatography (ii) thin layer chromatography
(iii) gel chromatography (iv) ion-exchange chromatography
- 6 Which one of the following is suitable for the purification of solids through sublimation techniques?
(i) oxalic acid (ii) benzoic acid
(iii) naphthalene (iv) chlorobenzene
- 7 In a series of reactions, which is the rate determining step?
(i) The fastest reaction (ii) The slowest reaction
(iii) The simplest reaction (iv) The main reaction involving the major reactant
- 8 A catalyst will affect the rate of the forward reaction by changing the
(i) Heat of formation (ii) Heat of reaction
(iii) Potential energy of the products (iv) Activation energy
- 9 Green house gas which present in very high quantity in
(i) CH₄ (ii) CO₂
(iii) N₂O (iv) CFC
- 10 The percentage of water pollution is caused by domestic washes and sewages is _____
(i) 55% (ii) 65%
(iii) 75% (iv) 85%

SECTION - B (25 Marks!)

Answer **ALL** questions

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

11 a State and explain Pauli exclusion principle.

OR

b Calculate the oxidation numbers of

triiodine, hydrogen peroxide in H₂PO₄,

triiodine.

- 12 a State and explain Huckel's rule.
OR
b Outline the properties of menthol.
- 13 a Explain the following terms .
i) Normality ii) Molality iii) Mole fraction
OR
b Describe the principle and applications of paper chromatography.
- 14 a Derive an expression for the first-order rate constant.
OR
b Summarize the characteristics of catalytic reactions.
- 15 a Classify the effects of air pollutants.
OR
b What is acid rain? How is it formed?

SECTION -C (40 Marks)

Answer **ALL** questions

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

- 16 a i) Distinguish between orbit and orbital.
ii) Discuss the shapes of s, p and f orbitals.
OR
b i) State and explain Aufbau principle.
ii) Discuss the geometry of PCl_5 molecule using VSEPR theory.
- 17 a How will you prepare the following from benzene
i) Benzaldehyde ii) Cyclohexane iii) Toluene iv) Benzyl Chloride
OR
b Discuss the preparation and properties of nicotine.
- 18 a Discuss the method of purification of solids by recrystallization.
OR
b Discuss the method of distillation under reduced pressure.
- 19 a Write notes on
i) Order ii) Parallel reactions iii) Chain reactions
OR
b Discuss the following with suitable example
i) Promoters ii) Auto catalysis iii) Enzyme catalysis
- 20 a Enumerate the sources of water pollutants.
OR
b i) What is green house effect?
ii) Discuss the factors affecting soil pollution.