

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – PHYSICS

CHEMISTRY – II

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

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

- Choose the unit of molarity from the following
(i) mol litre⁻¹ (ii) mg litre⁻¹ (iii) millilitre (iv) mol litre
- Which among the following is a primary standard solution?
(i) Na₂S₂O₃ solution (ii) NaOH solution
(iii) K₂Cr₂O₇ solution (iv) KMnO₄ solution
- Nitration of thiophene with HNO₃ under ordinary condition gives
(i) 2-nitrothiophene (ii) 2,5-dinitrothiophene
(iii) 3-nitrothiophene (iv) 3,4-dinitrothiophene
- Identify detergents are
(i) hard soaps (ii) metallic insoluble soaps
(iii) synthetic soaps (iv) cleaning agents but not soap
- Find the unit of specific conductance from the following
(i) ohm cm⁻¹ (ii) ohm⁻¹ cm (iii) ohm cm (iv) ohm⁻¹ cm⁻¹
- Freundlich isotherms is not applicable at
(i) 273 K (ii) low pressure
(iii) high pressure (iv) room temperature
- A system that can transfer neither matter nor energy to and from its surroundings is called
(i) a homogeneous system (ii) an isolated system
(iii) a closed system (iv) an open system
- Entropy is a measure of _____ of the molecules of the system.
(i) randomness or disorder (ii) zig-zag motion
(iii) concentration (iv) velocity
- Which region is commonly called vacuum ultraviolet region from the following
(i) above 200 mμ (ii) below 200 mμ (iii) above 300 mμ (iv) 250- 300 mμ
- Indicate from the following, which shift is also called as blue shift ?
(i) bathochromic shift (ii) hypsochromic shift
(iii) hyperchromic shift (iv) hypochromic shift

Cont...

SECTION - B (25 Marks)

Answer ALL questions

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

- 11 a) Outline the methods used for minimization of errors.
(OR)
b) Compare the precision and accuracy of a set of analytical data.
- 12 a) Explain the properties of furan.
(OR)
b) Differentiate between soaps and detergents.
- 13 a) Outline the mechanism of buffer action of a basic buffer.
(OR)
b) Compare the chemisorption and physisorption.
- 14 a) Distinguish between reversible and irreversible processes.
(OR)
b) Show thermodynamically that for an ideal gas $C_p - C_v = R$.
- 15 a) Highlight on i) bathochromic shift ii) hyperchromic shift
(OR)
b) Explain the following terms with examples.
i) chromophores ii) auxochromes

SECTION - C (40 Marks)

Answer ALL questions

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

- 16 a) i) Explain the principles of volumetric analysis.
ii) How will you prepare primary and secondary standard solutions?
(OR)
b) Discuss in detail about the simple first aid techniques in laboratory accidents.
- 17 a) Discuss the primary and secondary structure of proteins.
(OR)
b) Discuss the types of soaps and detergents.
- 18 a) State and explain i) Faraday's laws of electrolysis ii) Kohlrausch's law of ionic mobility.
(OR)
b) Discuss Langmuir theory of adsorption and derive expression for Langmuir monolayer adsorption isotherm.
- 19 a) i) Give the definition and examples of open and closed system.
ii) State and explain the various statements of second law of thermodynamics.
(OR)
b) i) State the first law of thermodynamics.
ii) Prove that the value of Joule Thomson coefficient is zero for an ideal gas.
- 20 a) Discuss the various types of electronic transitions with examples.
(OR)
b) Discuss the instrumentation and applications of UV-Visible spectroscopy.

Z-Z-Z

END