Total No. of printed pages = 6

END SEMESTER REGULAR EXAMINATION, JANUARY – 2025

Semester : 1st (New)

Branch : Common to All

Subject Code : BS-105

APPLIED CHEMISTRY

Full Marks – 60

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

(i) Question numbers 1 to 3 are compulsory and objective type.

(ii) Answer any *five* questions from Question numbers 4 to 9.

1. Fill in the blanks : 1×5=5

   (a) Gram per litre = Normality × _____.

   (b) In covalent compounds the bond is formed due to _____ of electrons.

[Turn over

(c) Inversion of cane sugar is catalysed by _____ enzyme.

(d) Chemical equilibrium is _____ in nature.

(e) Ammonium hydroxide is an example of _____ electrolyte.

2. Choose the correct answers : 1×5=5

(a) The colour of phenol-phthlein indicator in alkaline medium is

(i) Yellow (ii) Colourless

(iii) Pink (iv) Orange

(b) 0.1 mole of HCl is equal to

(i) 3.65 gram of HCl

(ii) 36.5 gram of HCl

(iii) 18 gram of HCl

(iv) 365 gram of HCl

(c) p^H of 0.001(M) ~~H_2SO_4~~ HCl solution is

(i) 1 (ii) 2

(iii) 3 (iv) 4

(d) Water can be sterilized by

(i) Sulphur (ii) Ozone

(iii) Magnesium (iv) Sodium

(e) German silver is an alloy of

(i) Calcium (ii) Silver

(iii) Potassium (iv) Copper.

3. Match the following Column – A with Column – B : 1×5=5

Column – A	Column – B
(a) CaO	(i) Electronic configuration
(b) Sulphur	(ii) Softening of water
(c) Aufbau principle	(iii) Basic flux
(d) Gram/Coulomb	(iv) Vulcanization of Rubber
(e) Ion-exchange process	(v) Electro-chemical equivalent.

4. (a) What is a Redox reaction ? Give an example of a Redox reaction. 2

(b) Balance the following equation by ion-electron method (any *one*) : 3

(i) $Cr_2O_7^{2-} + C_2O_4^{2-} + H^+ \rightarrow Cr^{3+} + CO_2 + H_2O$

(ii) $Cr_2O_7^{2-} + H^+ + Cl^- \rightarrow Cr^{3+} + Cl_2 + H_2O$.

(c) What is Alkalimetry ?

50 ml of 0.15N NaOH solution is diluted to make it 0.1N solution. Calculate the amount of water added. 1+3=4

5. (a) What do you mean by Heisenberg's uncertainty principle ? 2

(b) Write down the electron dot structure of the following compound (any *three*) : 1×3=3

(i) CaO (ii) $MgCl_2$

(iii) NH_3 (iv) N_2.

(c) What is Hydrogen bonding ? Classify the different types of hydrogen bonding with suitable examples. 1+2=3

(d) State the Law of mass action. 1

6. (a) What is Buffer solution ? Explain the different types of buffer solution with examples. 1+2=3

(b) What is a Catalyst and Catalysis ? Name the catalyst used in the synthesis of 3

(i) Ammonia by Haber's process.

(ii) Sulphuric acid by contact process.

(c) 10 ampere current is passed through a copper sulphate cell for 2 hours. Calculate the amount of copper deposited at cathode. 3

7. (a) What is Rusting of Iron ? Write the mechanism of Rusting of Iron. 1+2=3

(b) What is Portland cement ? Write the function of lime and gypsum in Portland cement. 1+2=3

(c) Differentiate between Calcination and Roasting. 3

8. (a) What is Homopolymer and Co-polymer ? Give examples. 3

(b) What is the difference between temporary hard water and permanent hard water. 3

(c) What is sterilization of water ? How water can be sterilized by using bleaching powder ? 3

9. Write short notes on any *three* : 3×3=9

(a) Normal solution and Molar solution

(b) Primary cell and Secondary cell

(c) Quantum numbers

(d) Classification of glass.