V11C

Virudhunagar District
Common First Revision Test - January 2025

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Standard 11
CHEMISTRY

Time Allowed: 3.00 Hours   Maximum Marks: 70

PART-I

Note : i) Answer all the questions.   15×1=15
       ii) Choose the most appropriate answer from the given four
         alternatives and write the option code and corresponding answer.

1) The basicity of H_2SO_4 is _____.
   a) 2   b) 3   c) 1   d) 6

2) Which one of the following is used as a standard for atomic mass?
   a) $_6C^{13}$ b) $_6C^{12}$ c) $_7C^{12}$ d) $_6C^{14}$

3) The number of radial nodes in orbitals are equal to _____.
   a) $(n - l + 1)$ b) $(n + l - 1)$ c) $(n - l - 1)$ d) $(l - n - 1)$

4) What is the temporary symbol of atomic number 118?
   a) Uup   b) Uuh   c) Uus   d) Uuo

5) Water gas is
   a) $H_2O_{(g)}$ b) $CO + H_2O$ c) $CO + H_2$ d) $CO + N_2$

6) The value of universal gas constant depends upon
   a) Temperature of the gas   b) Volume of the gas
   c) Number of moles of the gas   d) Units of pressure and volume

7) Maximum deviation from ideal gas is expected from
   a) $CH_{4(g)}$ b) $NH_{3(g)}$ c) $H_{2(g)}$ d) $N_{2(g)}$

8) In an adiabatic process, which of the following is true?
   a) $q = W$ b) $\Delta E = q$ c) $p\Delta v = 0$ d) $q = 0$

9) The values of ΔH and ΔS for a reaction are respectively 30 kJ mol^{-1} and 100 Jk^{-1} mol^{-1}. Then the temperature above which the reaction will become spontaneous is
   a) 300 k   b) 30 k   c) 100 k   d) 20°C

10) If kb and kg for a reversible reaction are 0.8×10^{-5} and 1.6×10^{-4} respectively, the value of the equilibrium constant is,
   a) 20   b) 0.2×10^{-1} c) 0.05   d) none of these

11) Consider the following reversible reaction at equilibrium, $A + B \rightleftharpoons C$, if the concentration of the reactant A and B are doubled, then the equilibrium constant will
   a) be doubled   b) become one fourth
   c) behalved   d) remain the same

12) Sodium nitropruside reacts with sulphide ion to give a purple colour due to the formation of
   a) $[Fe(CN)_5NO]^{3-}$ b) $[Fe(NO)_5CN]^+$
   c) $[Fe(CN)_5NOS]^{4-}$ d) $[Fe(CN)_5NOS]^{3-}$

13) The isomer of ethanol is
   a) acetaldehyde   b) dimethylether
   c) acetone   d) methyl carbinol

14) $-I$ effect is shown by
   a) $-Cl$ b) $-Br$ c) both a and b   d) $-CH_3$

15) What is the hybridisation state of benzyl carbonium ion?
   a) sp^2 b) spd^2 c) sp^3 d) sp^2d

PART-II

Note : Answer any six questions. Question Number 24 is compulsory.   6×2=12

16) Define relative atomic mass.

17) State Pauli exclusion principle.
18) Define modern periodic law.
19) Give the uses of heavy water.
20) When ammonia combines with HCl, NH_4Cl is formed as white dense fumes. Why do more fumes appear near HCl?
21) Define Hess's law of constant heat summation.
22) Write a balanced chemical equation for the equilibrium reaction for which the equilibrium constant is given by expression

$$Kc = \frac{[NH_3]^4 [O_2]^5}{[NO]^4 [H_2O]^6}$$

23) Give the principle of fractional distillation.
24) Give examples for the following types of organic reactions.
    i) β - elimination   ii) electrophilic substitution

PART-III

Note : Answer any six questions. Question Number 33 is compulsory. 6×3=18

25) Which contains the greatest number of moles of oxygen atoms.
    i) 1 mol of ethanol   ii) 1 mole of formic acid   iii) 1 mol of H_2O
26) Describe the Aufbau principle.
27) What is screening effect?
28) How do you convert Para hydrogen into Ortho hydrogen?
29) A small bubble rises from the bottom of a lake where the temperature and pressure are 6°C and 4 atm to the water surface, where the temperature is 25°C and pressure is 1 atm. Calculate the final volume in (mL) of the bubble, if its initial volume is 1.5 mL.
30) Write the summary of sign conventions by the system.
31) If there is no change in concentration, why is the equilibrium state considered dynamic?
32) What are electrophiles and nucleophiles? Give suitable examples for each.
33) Give the structure for the following compound.
    i)   1,3,5 – Trimethyl cyclohex-1-ene
    ii) 3-Chlorobut-1-ene
    iii) acetaldehyde

PART-IV

Note :   Answer all the questions: 5×5=25

34) a) Balance the following equation using oxidation number method.
        $As_2S_3 + HNO_3 + H_2O \longrightarrow H_3AsO_4 + H_2SO_4 + NO$ (OR)
    b) i) Which quantum number reveal information about the shape, energy, orientation and size of orbitals?
       ii) How many Orbitals are possible for n=4?
35) a) Explain the Pauling method for the determination of ionic radius.   (OR)
    b) Compare the structure of H_2O and H_2O_2.
36) a) Derive the values of critical constants in terms of Van der Waals constants.   (OR)
    b) State the various statements of second law of thermodynamics.
37) a) Derive the relation between Kp and Kc.   (OR)
    b) Explain various types of constitutional isomerism in Organic compounds.
38) a) Describe the reactions involved in the detection of nitrogen in an Organic compound by Lassaigne method.   (OR)
    b) i) Show the heterolysis of covalent bond by using curved arrow notation and complete the following equations.
          Identify the nucleophile is each case.
          i) $CH_3 - Br + KOH \longrightarrow$
          ii) $CH_3 - OCH_3 + HI \longrightarrow$
       ii) Explain electrometric effect.