SADHU RAM VIDYA MANDIR
Education for life
CBSE AFF:3330247 CODE: 15202

HALF YEARLY EXAMINATION (2020-21)

Class : XII Student's Name: ……Roll. No. ……

Subject : Chemistry Date: 07/10/2020 Max. Marks: 80 Time: 3 Hrs.

Invigilator's Name:……Sign:……

General Instructions :

1. **All the questions are compulsory.**
2. **Visit the website www.srvmschools.org to answer the questions.**
3. **Student will fill the details on answer sheet and write the test during the above given schedule.**
4. **The time of the Half yearly examination-2020 will be 9:00 a.m to 12:45 p.m .**
5. **Out of all question papers of classes XI and XII, a few have been set for 80marks each while others have been set for 70 marks each. However, each question papers contain – 30% 1-mark questions; 20% of them will be MCQs and the remaining 10% questions will be case based/source based, and the rest of the questions will be subjective type. The details of marking scheme has been given on the previous page.**
6. **The password protected question paper will be downloaded from school Website (https://srvmschools.org/) by the students. A key will be provided to the students before 15 minutes of the examination schedule on the date of examination to unlock the question paper on WhatsApp Group.**
7. **The Students will write the test on Answer sheet provided by the school. The answers written by the students during the scheduled test date and time will be considered final. After the scheduled time, no other record of answer by the students will be taken into consideration for final evaluation.**
8. **A link will be provided by the school for posting of online attendance by uploading the photo of first page of filled answer sheet by the student before 5 minutes of the examination on all examination days. It is compulsory for the students of IX,X,XI and XII to remain live on video during the first hour of examination on all examination days. Students muting the video will be treated as absent. All the students must wear school uniform during the examination.**
9. **After writing the paper, the student will record the completion attendance at 12:45p.m without fail. The link for attendance will be available from 9:00 a.m to 12:45 p.m only.**
10. **The first 15 minutes have been allotted for reading this question paper. These 15 minutes have to be used by the candidates for thorough silent reading of the question paper. During this period, the students will not write any answer on the answer- book and the question paper. Write in neat and clean handwriting.**
11. **For assistance, the class teachers may be contacted.**

Section A

The following questions consists of an Assertion (A) and a Reason (R). Use the following keys to select the correct answer.

(a) if both (A) and (R) are correct and (R) is the correct explanation of (A).
(b)if both (A) and (R) are correct but (R) is not the correct explanation of (A).
(c) if (A) is correct but (R) is incorrect.
(d) if (A) is incorrect but (R) is correct.

1. (A) The vapour pressure of 0.1 M sugar solution is more than that of 0.1 M KCl solution. (1)
(R) Lowering of vapour pressure is directly proportional to the number of solute particles present in the solution.

2. (A) KCN reacts with methyl chloride to give methyl isocyanide. (1)
(R) CN- is an ambident nucleophile.

3. (A) The rate of reaction sometimes does not depend on concentration. (1)
(R) The order of the reaction can be negative.

4. (A) Aqueous gold colloid is red in colour. (1)
(R) The colour arises due to scattering of light by colloidal gold particles.

5. (A) Reaction of SO_2 with H_2S in the presence of Fe_2O_3 gives elemental sulphur. (1)
(R) SO_2 is a reducing agent.

CHOOSE THE CORRECT ANSWER

6. Which of the following molecule is chiral? (1)
(a) 2- bromo butane (b) 1- Bromobutane (c) 2-Bromopropane (d) 2-Bromopropan-2-ol

7. When methyl magnesium iodide reacts with acetone and the product is hydrolysed we get: (1)
(a) primary alcohol (b) secondary alcohol (c) tertiary alcohol (d) an aldehyde

8. Which one of the following statement on order of a reaction is incorrect? (1)
(a) order is always a whole number (b) order can be determined experimentally
(c) order is not influenced by stoichiometric coefficient of the reactants
(d) order of the reaction is some of the power of the concentration terms of reactants to express the rate of the reaction.

9. The hybridization of nitrogen in NO_2^+, NO_3^- and NH_4^+ are respectively: (1)
(a) sp, sp^3 and sp^2 (b) sp^2, sp and sp^3 (c) sp, sp^2 and sp^3 (d) sp^3, sp^2 and sp

10. In a transition series, with increase in atomic number paramagnetism: (1)
(a) increases gradually (b) first increases to a maximum and then decreases
(c) decreases gradually (d) first decreases to a minimum and then increases

NAME IT

11. Pentane that gives only one mono halo derivative on halogenation (1)
12. An ideal solution. (1)
13. A chelate (1)
14. The movement of Sol particles under an electric field to oppositely charged electrode (1)
15. Element with highest magnetic moment in 3d series. (1)

READ THE FOLLOWING PASSAGE AND ANSWER THE QUESTIONS:

In haloalkanes, the C- X bond is polar in nature and so they are highly reactive molecules. The carbon atom to which halogen is attached is highly susceptible to attack by electron rich species.When a nucleophile stronger than halide ion approaches the positively charged carbon atom of a haloalkane, halogen atom with its bonded pair of electrons gets displaced and a new bond between the carbon atom and the incoming nucleophile is formed. Such a reaction is known as nucleophilic substitution reactions.

There are two types of nucleophilic substitution reactions. First type is a uni molecular reaction and the other is bi molecular reaction. S_N1 reaction takes place in two steps. In the slow first step the alkyl halide dissociates into a carbocation and halide ion. In the second step, the nucleophile combine with the carbocation and form the product. The rate of the reaction is governed by the formation of carbocation. When isopropyl chloride reacts with KCN, S_N1 mechanism takes place.

16. Why is C-X bond is polar? (1)
17. Which kind of fission of bond gives carbocation? (1)
18. Write the rate equation for S_N1 reaction. (1)
19. Give the order of stability of carbocation. (1)
20. How does carbocation stabilize? (1)
21. Give an example of a nucleophile. (1)

Section B

Answer the following question in 20 to 30 words.

22. When alkyl halide reacts with KNO_2 alkyl nitrite is formed but it gives nitroalkane when reacts with $AgNO_2$. Explain. (2)

23. When 10 ml of liquid A is mixed with 10 ml of liquid B, the volume of resulting solution is found to be 20.1 ml. Write your conclusion about the observation. (2)

24. For the following reaction 2P --> 4Q + R, concentration of Q is found to increase by 0.005 mol/L in 10 seconds. Find (i) rate of appearance of Q, (ii) rate of reaction and rate of disappearance of P. (2)

25. Define Brownian motion. Write the cause of it. (2)

26. Explain the following observations.

(a) Boiling point of HF is higher than that of HCl. (1)

(b) IF_7 exists but BrF_7 does not. (1)

27.Cuprous compounds are white and dia magnetic but cupric compounds are coloured and paramagnetic. Explain. (2)

28. Tetrahedral nickel (ll) complexes are paramagnetic but square plannar nickel (ll) complexes are diamagnetic. Explain. (2)

29. How do you distinguish between primary, secondary and tertiary alcohol on the basis of oxidation? (2)

Section C

Answer the following questions in 50-60 words.

30. At 298K , 100ml of a solution containing 3.002 g of an unknown solute exhibits an osmotic pressure of 2.55 atm. Calculate the molar mass of unknown solute. (3)

31. Account for the following (3)

(a) Alum is used for cleaning turbid water.

(b) A delta is formed where river water meets sea.

(c) colour of sky is blue.

32. What is lanthanoid contraction. Write its consequences. (3)

33.Explain briefly crystal field splitting in octahedral complexes. (3)

34.How is the following conversions achieved? (3)

(i) propene to propyne

(II) but-1-ene to but-2-ene

(III) benzene to acetophenone

35. Give reason (1+2)

(i) Alcohol is less acidic than phenol.

(ii) phenol is ortho- para directing with respect to electrophillic substitution reactions.

Section D

Give answer in details. (80 to 100 words)

36. Explain the following (5)

(a) Fittig reaction

(b) Sandmeyer reaction

(c) Finkelstein reaction

(d) Hydroboration- oxidation reaction

(e) Lucas reaction

OR

A primary alkyl halide C_4H_9Br (A) on reaction with alcoholic KOH gives compound B. B reacts with HBr to give C which is an isomer of A. When A is treated with sodium metal it gives compound D (C8H18) which is different from the compound formed when n-butyl bromide reacts with sodium. Identify A to D and write the chemical reactions involved.

37. Explain the following (5)

(a) The stability of+5 oxidation state decreases down the 15 group (1)

(b) Bi(v) is a stronger oxidant than Sb(v) (1)

(c) Neon is generally used in warning signals (1)

(d) Structure of Xenone fluoride can not be explained by valance bond theory . (1)

(e) White phosphorus is more stable than red phosphorus. (1)

OR

Account for the following

(a) Phosphorus glows in the dark. (1)

(b) Noble gases have very low boiling points (1)

(c) H_2S is more acidic than water. (1)

(d) All bonds in SF_4 are not equivalent. (1)

(e) Despite having greater polarity HF boils at lower temperature than water. (1)

38. A reaction in which A and B form C following data were obtained from the experiments. (5)

Expt. No.	Initial concentration A in mol/L	Initial concentration B in mol/L	Initial rate (mol/L/s)
1	0.01	0.01	1.2×10^{-4}
2	0.01	0.02	2.4×10^{-4}
3	0.02	0.02	9.6×10^{-4}

Calculate. (i) order of reaction with respect to A

(ii) order of reaction with respect to B

(iii) Overall order of reaction.

(iv) rate law

(v) Rate constant for the reaction.

OR

Derive the integrated rate equation for a first order reaction. Hence deduce the equation for half life period of a first order reaction.

****