SAMPLE PAPER TERM-1 EXAMINATION, 2019-2020
CLASS – XII
CHEMISTRY

Time Allowed : 3 Hours **Max. Marks-70**

General Instructions:

1. ***All questions are compulsory. There are 37 questions in all.***
2. ***The question paper has four section : Section –A, Section-B, Section-C and Section D.***
3. ***Section –A contains 20 questions of one mark. Section B contains 7 questions of two marks , Section-C contains 7 questions of three marks and Section –D contains 3 question of five marks each.***
4. ***There is no overall choice(s) . However , an internal choice (s)has been provided in 4 questions of one mark, 3 questions of two marks, 3 questions of three marks and 3 questions of five marks. You have to attempt only one of the choices in such questions.***
5. ***Use of calculator is not permitted . You may ask for logarithmic tables, if required.***

SECTION-A

1. The major products obtained on interaction of phenol with sodium hydroxide and carbon dioxide is **[1]**

(a) salicylaldehyde (b) salicyclic acid
(c) phthalic acid (d) benzoic acid

2. $2H^+ + 1/2\ O_2 + 2e^- \longrightarrow H_2O$, $E^o = 1.23V$ **[1]**

$Fe^{2+} + 2\ e^- \longrightarrow Fe(s)$, $E^o = -0.44V$

ΔG^o (in KJ) for the reaction is
(a) -76 (b) -322 (c) -122 (d) -176

3. Which of the following is an example of absorption: **[1]**
(a) Water on silica gel **(b)** Water on calcium chloride
(c) Hydrogen on finely divided nickel **(d)** Oxygen on metal surface

4. An organic compound X on treatment with pyridium chlorochromate in dichloromethane gives compound Y. Compound Y reacts with I_2 and alkali to forn triiodomethane. The compound 'X' is
(a) CH_3CHO **(b)** CH_3CH_2OH **[1]**
(c) CH_3COCH_3 **(d)** CH_3COOH

5. Which of the following reactions will not result in the formation of carbon-carbon bond? **[1]**
(a) Friedal-Crafts acylation (b) Wurtz reaction
(c) Cannizaro reaction (d) Reimer-Tiemann reaction

6. Which of the following statement is not correct about an inert electrode in a cell? **[1]**
(a) It does not participate in the cell reaction
(b) It provide surface either for oxidation or for the reduction reaction.
(c) It provides surface for conduction of electrons.
(d) It provides surface for redox reaction

7. If rate constant of a first order reaction is 2 min^{-1} , then its half life period will be ____ **[1]**

8. Name the product when anisole reacts with HI. **[1]**

9. Physical adsorption of a gas on a solid _____with _____in temperature. **[1]**

10. Why is freezing point depression of 0.1 M sodium chloride solution nearly twice that of 0.1 M glucose solution? **[1]**

11. From the rate expression of the given reaction , determine the order of reaction and the dimensions of the rate constant:

$3\ NO_{(g)} \longrightarrow N_2O_{(g)} + NO_{2(g)}$; rate = $k[NO]^2$ **[1]**

12. Desalination of sea water is based on _____. **[1]**

13. Butanenitrile can be prepared by heating _____with alcoholic KCN. **[1]**

14. Why is (±) 2 -Butanol optically inactive? **[1]**

15. Which of the following is food preservative? **[1]**
Sodium sulphonate , Equanil, Morphine, Sodium benzoate

16. Is $-\left(-CH_2\text{-}\underset{\displaystyle Cl}{\underset{|}{CH}}\right)_n-$ a homopolymer or a copolymer? justify. **[1]**

17. What is the difference between a nucleoside and nucleotide? **[1]**

18. Give one important use of following medicines in Pharmacy: **[1]**
(i) Renitidine (ii) Chlorophenicol

In the following question a statement of assertion followed by a statement of reason is given . Choose the correct answer out of the following choices.
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

19. Assertion: The pKa of acetic acid is lower than that of phenol.
Reason: Phenoxide ion is more resonance stabilized than acetate ion. **[1]**

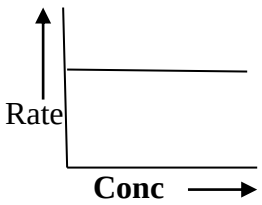
20. Give the IUPAC name of the following compound: **[1]**

$CH_3-CH_2-CH(OH)\text{-}CH_2\text{-}CONH_2$

SECTION –B

21. What is meant by positive deviation from Raoult's law? Give an example. What is the sign of $\Delta_{mix}H$ for positive **[2]**

22. a) For a chemical reaction , variation in rate with concentration is shown below: **[2]**



(i) What is the order of the reaction?
(ii) What is the unit of rate constant K for the reaction?
(iii) What is the relation between half life period and concentration ?

23. Define the following terms giving one suitable example for each: **[2]**

(a) Peptisation

(b) Homogeneous catalysis

24. Explain the following and give one example of each**:** **[2]**

(a) Antipyretics **(b)** Antioxidants

OR

(a) Why are detergents preferred over soaps?

(b) What class of drug is used in sleeping pills?

25. Write mechanism of hydration of ethene to form ethanol. **[2]**

26. The thermal decomposition of HCO_2H is a first order reaction with a rate constant of 2.4×10^{-3} s^{-1} at a certain temperature. Calculate how long will it take for three –fourths of initial quantity of HCO_2H to decompose. **[2]**

27. Write equation for the synthesis of the given polymers : **[2]**

(a) Terelene

(b) Nylon-2-Nylon-6

OR

Mention the important uses of the following :

(a) PVC

(b) Urea formaldehyde resin

SECTION-C

28. (a) Define the following terms: **[1x3=3]**

(i) Peptide linkage.

(ii) Denaturation of protein.

(b) During Curdling of milk, what happens to the sugar present in it?

29. Give reasons for the following : **[3]**

(a) Gelatin is generally added to icecreams.

(b) $Fe(OH)_3$ colloid is positively charged when prepared by adding $FeCl_3$ to hot water..

(c) Lyophilic sols are more stable than lyophobic sols.

OR

(a) Why is adsorption always exothermic?

(b) Discuss the effect of pressure and temperature on the adsorption of gases on solids.

30. How will you bring out following conversions: **[3]**

(a) chlorobenzene to para chloroaniline

(b) Bromobenzene to 1-Phenylethanol

(c) Ethanol to ethyl ethanoate

OR

A compound 'A' with molecular formula $C_5H_{10}O$ gave a positive 2,4-DNP test but a negative Tollen's reagent test. It was oxidized to carboxylic acid'B'with molecular formula $C_3H_6O_2$ when treated with alkaline $KMnO_4$ under vigorous condition . Sodium salt of 'B' gave a hydrocarbon 'C' on Kolbe's electrolytic reduction .Identify A, B and C and write the chemical equations for the reaction.

31. A 0.2 percent aqueous solution of a non volatile solute exerts a vapour pressure of 1.004 bar at 100^oC. What is the molar mass of the solute?

[Given Vapour pressure of pure water at 100^oC is 1.013 bar and molar mass of water is 18 $gmol^{-1}$] **[3]**

32. (a) Which will have a higher boiling point and why? **[1x3=3]**

1-Chlorobutane or 2-Chloro-2-methylpropane.

(b) p-Nitro chlorobenzene undergoes nucleophilic substitution faster than Chlorobenzene. Give reason.

(c) Which of the following has chirality centre?

(i) 3-Bromohexane (ii) 2- methylbutane (iii) sec-butyl chloride (iv) Ethanediol

33. (a) Why does the molar conductivity of a weak electrolyte decreases on dilution?

(b) A current of 1.50 ampere was passed through an electrolytic cell containing $AgNO_3$ solution with inert electrodes. The weight of Ag deposited was 1.50 g. How long did the current flow? (Atomic mass of Ag=108g) **[3]**

34. Write the chemical reaction when : **[1x3=3]**

(a) Aniline reacts with acetic anhydride in the presence of pyridine.

(b) Benzamide reacts with Lithium aluminium hydride

(c) Benzene sulphonyl chloride is treated with dimethylamine.

SECTION-D

35. (a) State the law which helps to determine the limiting molar conductivity of weak electrolytes.

(b) For the reaction

$2AgCl(s) + H_2(g)\ (1\ atm) \longrightarrow 2Ag(s) + 2H^+(0.1M) + 2Cl^-(0.1\ M)$

$\Delta G^0 = -43600$ J at 25^oC .

Calculate the e.m.f of the cell.

(c) Predict the products of electrolysis at the electrodes in each case when the electrodes used are platinum.

(i) an aqueous solution of $CuSO_4$

(ii) molten lead bromide

OR **[1+2+2=5]**

(a) Define molar conductivity.

(b) Write the cell reaction and calculate the e.m.f of the following cell at 298K:

$Sn(s) \mid Sn^{2+}(0.004M) \parallel H^+(0.020\ M) \mid H_2(g)\ (1\ bar) \mid Pt(s)$

(Given : $E^o\ Sn^{2+}/Sn = -0.14$ V)

(c) What type of a battery is the lead storage battery? Write the anode and the cathode reactions and the overall reaction occurring in a lead storage battery when current is drawn from it.

36. (a) The rate of a reaction increases to four times when the prevailing temperature is raised from 300 K to 320 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature.

(b) The following results have been obtained during the kinetic studies of the reaction:

$2A + B \longrightarrow C + D$

Experiment	[A]/mol L^{-1}	[B]/mol L^{-1}	Initial rate of formation of D/mol L^{-1} min^{-1}
I	0.1	0.1	6.0×10^{-3}
II	0.3	0.2	7.2×10^{-2}
III	0.3	0.4	2.88×10^{-1}
IV	0.4	0.1	2.40×10^{-2}

Determine the rate law.

OR **[2+3=5]**

(a) A reaction is of second order with respect to a reactant. How is the rate of reaction affected if the concentration of the reactant is reduced to half? What is the unit of rate constant for such a reaction?

(b) During nuclear explosion, one of the products is ^{90}Sr with half-life of 28.1 years. If 1 μg of ^{90}Sr was absorbed in the bones of a newly born instead of calcium, how much of it will remain after 10 years and 60 years if it is not lost metabolically?

37. (a) Illustrate Hell -Volhard Zelinsky reaction with suitable example.

(b) Give simple test to distinguish between the following pairs of compounds:

(i) Benzoic acid and sodium benzoate

(ii) Cyclobutane carbaldehyde and Acetone

(c) Account for the following :

(i) Aromatic carboxylic acids do not undergo Friedal-Crafts reaction.

(ii) pKa value of 4-nitrobenzoic acid is lower than that of benzoic acid..

OR **[1+2+2=5]**

(a) Explain Wolff-Kishner reduction with a suitable example.

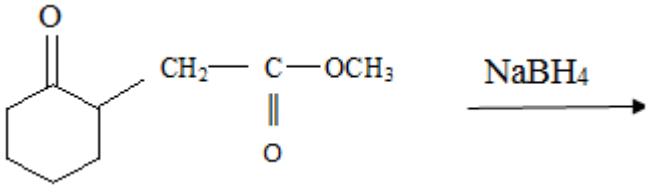
(b) Arrange the following in the increasing order of their property as indicated and justify:

(i) **(**$(CH_3)_2CHCOOH$, CH_3COOH, HCOOH, and $(CH_3)_3CCOOH$ (Acidic Strength)

(ii) Acetaldehyde, Acetone , Di-tert-butyl ketone, , Methyl tert-butyl ketone (Reactivity towards HCN)

(c) Write the structures of the main products in the following reactions:

(i)



(ii)