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**SPLIT EXAM- I**

**CHEMISTRY**

**GRADE: XII MARKS: 70**

**DATE: 24.11.2022 TIME – 3 hr**

**GENERAL INSTRUCTIONS:**

1. All Questions are compulsory.
2. **SECTION-A:** Question number 1 to 18 carry 1 mark.
3. **SECTION-B:** Question number 19 to 25 carry 2 marks.
4. **SECTION-C:** Question number 26 to 30 carry 3 marks.
5. **SECTION-D:** Question number 31 and 32 carry 4 marks.
6. **SECTION-E**: Question number 33 to 35 carry 5 marks.

**SECTION-A**

**1. Acid catalyzed hydration of alkenes except ethane leads to the formation of --------------.**

**a. A mixture of secondary and tertiary alcohols**

**b. A mixture of primary and secondary alcohols**

**c. Secondary or tertiary alcohols**

**d. Primary alcohols**

**2. Which of the following is formed when phenol is exposed to air?**

**a. o-Benzoquinone b. p-benzoquinone**

**c. phenoquinone d. o and p-benzoquinone**

**3. When potassium ferrocyanide crystals are heated with conc.sulphuric acid, the gas evolved is**

**a. Sulphur dioxide b. Ammonia**

**c. Carbon monoxide d. Carbon-di-oxide**

**4. The pair that has similar atomic radii**

a. Mn and Re b. Ti and Hf

c. Sc and Hf d. Mo and W

**5. The iron salts used in blue prints**

a. FeC2O4 b. Fe2(C2O4)

c. K4 [Fe(CN)6 ] d. FeSO4

**6. For the reaction N2 + 3H2 → 2NH3 if d[NH3]/dt is 2 x 10-4 mol L-1 s-1 , the value of -d[H2]/dt would be**

**a. 1 x 10-4 mol L-1 s-1**

**b. 3 x 10-4 mol L-1 s-1**

**c. 4 x 10-4 mol L-1 s-1**

**d. 6 x 10-4 mol L-1 s-1**

**7. For the reaction A→B, it is found that the rate of reaction doubles when the concentration of A is increased four times. The order of the reaction is**

a. Two b. One

c. Half d. Zero

**8. The half life of the first order reaction having rate constant k=1.7 x 10-5 s-1**

a. 12.1 h b. 9.7 h

c. 11.3 h d. 1.8 h

**9. Zinc and Hg does not variable valency like d-block elements because**

**a.** They are soft

b. Their d-shells are complete

c. They have only two electrons in the outermost subshell

d. their d-shells are incomplete

**10. When an inorganic compound is heated, it produces an organic compound.**

**a. cyanide of ammonium b. lime soda**

**c. sodamide d. cyanide of potassium**

Read the statements given as assertion & reason both and choose the correct option as per the following instructions.

**(**A) if both assertion & reason are correct statements and reason is the correct explanation of assertion.  
 (B) if both assertion & reason are correct statements and reason is not the correct explanation of assertion.  
 (C) if the assertion is the correct statement & the reason is an incorrect statement.  
 (D) if the assertion is incorrect statement and reason is the correct statement.

**11. Assertion:** Molecularity has no meaning for a complex reaction.  
 **Reason:** The overall molecularity of a complex reaction is equal to the molecularity of the slowest step.

**12. Assertion :**Sucrose is called an invert sugar.  
 **Reason :** On hydrolysis, sucrose bring the change in the sign of rotation from dextro to laevo.

**13. Assertion :**Bond angle is less in ethers is slightly less than the tetrahedral angle.  
 **Reason: There is a repulsion between two bulky groups.**

**14. Elements that generally exhibit multiple oxidation states and whose ions in an aqueous medium are usually colored:**

**a. Metalloids b. Transition elements**

**c. Non-metals d. Noble gases**

**15.** The reaction between formic acid and acetic acid distinguishes them.

a. Sodium ethoxide b. Sodium

c. HgCl2 d. 2,4-dinitrophenylhydrazine

**16. Silver nitrate produces a black stain on the skin due to**

**a. Being a strong reducing agent b. Its corrosive reaction**

**c. Formation of complexes d. Reduced to metallic silver**

**17. What will be the fraction of molecules having energy equal to or greater than activation energy?**

a. K b. A

c. Ae-Ea/RT d. e-Ea/RT

**18. One example of this is the production of cyanohydrin from a ketone**

**a. electrophilic addition b. Inclusion of nucleophiles**

**c. Replacement of nucleophilie d. Replacement of electrophilie**

**SECTION-B**

**19. Account for the following:**

**(a) There are 5 OH groups in glucose**

**(b) Glucose is a reducing sugar**

**20. Write the reaction and IUPAC name of the product formed when 2- Methylpropanal is treated with ethyl magnesium bromide followed by hydrolysis.**

**21. A first order reaction takes 69.3 min for 50% completion. What is the time needed for 80% of the reaction to get completed?**

**( Given: log 5 = 0.6990, log 8 = 0.9030, log 2 = 0.3010)**

**22. Write the reaction equations for the following:**

**Salicylic acid on treatment with acetic anhydride in the presence of conc.H2SO4 and give the name of the product.**

**OR**

**Write the reaction equation for the following:**

**(a) Tert-butyl chloride is treated with sodium ethoxide.**

**(b) Phenol is treated with chloroform in the presence of NaOH.**

**23. Write the equation for the following reactions:**

**(a) Hell-Volhard-Zelinsky Reaction**

**(b) Rosenmund Reduction Reaction**

**24. Give reasons for the following:**

**(a) The transition metals generally form coloured compounds.**

**(b) E0 value for Mn3+IMn2+ is highly positive than that for Cr3+ICr2+couple.**

**25. For the reaction A+B ---🡪 Product, the rate equation is given as k=[A]1/2 [B]2. Find the order of the reaction**

**SECTION-C**

**26. A hydrocarbon (A) with molecular formula C5H10 on ozonolysis gives two products (B) and (C). Both (B) and (C) give a yellow precipitate when heated with iodine in presence of NaOH while only (B) give silver mirror on reaction with Tollen’s reagent.**

**27. When MnO2 is fused with KOH in the presence of KNO3 as an oxidizing agent, it gives a dark green colour compound (A). Compound (A) disproportionates in acidic solution to give purple compound (B). An alkaline solution of compound (B) oxidises KI to compound (C) whereas an acidified solution of compound (B) oxidises KI to (D). Identify A, B, C and D.**

**28. Explain how and why will rate of the reaction for a given reaction be affected when,**

**(a) a catalyst is added**

**(b) the temperature at which the reaction was taking place is decreased**

**29.** What happens when D-Glucose reacts with HNO3 and bromine water?

**30. Arrange the following in the increasing order of their property indicated and give reason:**

**(a) Benzoic acid, Phenol, Picric acid, Salicylic acid (pKa values)**

**(b) Ethanol, Ethanoic acid, Benzoic acid (boiling point)**

**SECTION-D**

31. A reaction is said to be of the first order if the rate of the reaction depends upon one concentration term only. For a first order reaction of the type A → Products, the rate of the reaction is given as: rate = k[A]. The differential rate law is given as dA/dt = -k[A]. The integrated rate law is: ln [A]/[A0] = -kt, where [A] is the concentration of reactant left at time t and [A0] is the initial concentration of the reactant, k is the rate constant.

**1. The unit of rate constant for a first order reaction is** ----------.

2. Half life period of a first order reaction is 10 min. Starting with initial concentration 12 M, the rate after 20 min is ----------.

3. For a first order reaction, A→ Products, the concentration of A changes from 0.1 M to 0.025 M in 40 mins.The rate of reaction when the concentration of A is 0.01 M is

4. **The half life period of a first order reaction is 60 mins. What will be the percentage of left over after 240 mins?**

**32. When an aldehyde with no alpha hydrogen reacts with conc aqueous NaOH, half the aldehyde is converted to carboxylic acid salt and other half is converted to an alcohol. In other words, half of the reactants get oxidized and other half is reduced. This reaction is known as Cannizzaro reaction.**

**1. The mixture of benzaldehyde and formaldehyde gives ------------.**

**2. Which of the following compound gives cannizzaro reaction?**

**a. Acetaldehyde b. Acetone**

**c. Benzaldehyde d. Benzyl aldehyde**

**3. Trichloroactaldehyde is subjected to cannizzaro reaction by using NaOH. The mixture of the products contains sodium trichloroacetate ion and another compound. The other compounds is**

**a. 2,2,2 trichloroethanol b. trichloromethanol**

**c. 2,2,2 trichloropropanol d. chloroform**

**4. Which of the following reaction will not result in the formation of carbon-carbon bonds?**

**a. Cannizzaro reaction b. Wurtz reaction**

**c. Riemer-Tiemann reaction d. Friedel Crafts acylation**

**SECTION-E**

**36. An organic compound (A) with molecular formula C2Cl3O2H is obtained when (B) reacts with red P and Cl2. The organic compound (B) can be obtained on the reaction of methyl magnesium chloride with dry ice followed by acid hydrolysis.**

**(a) Identify A and B.**

**(b) Write down the reaction for the formation of A and B. What is the reaction called?**

**(c) Give any one method by which organic compound B can be prepared from its corresponding acid chloride.**

**(d) Which will be more acidic compound (A) or (B). Why?**

**(e) Write down the reaction to prepare methane from the compound (B)**

**37. Give reasons for the following:**

**(i) Mn3+ is a good oxidisng agent.**

**(ii) Why transition elements have variable oxidation state?**

**(iii) What is lanthanoid contraction? Name an important alloy which contains some of**

**38.(A). Account for the following:**

**(i) o-nitrophenol is more steam volatile than p-nitrophenol.**

**(ii) t-butyl chloride on heating with sodium methoxide gives 2-methyl propene instead of t-butylmethylether.**

**(B). Write the reaction involved in the following:**

**(i) Riemer-Tiemann reaction**

**(ii) Friedal-Crafts Alkylation of phenol**

**(C) Give simple chemical test to distinguish between ethanol and phenol.**