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**TERM-I EXAM**

**GRADE – XII MARKS - 70**

**SUBJECT – CHEMISTRY TIME – 3 hrs**

**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. Elucidate the formula for 10 primary halides**

 **a.CH3-Br b. CH3CH(Br)CH3 c. CH3CH(Br)CH2CH3**

 **d.None of the above**

 **2. Give the expression of first order rate equation.**

 **a. ln [A] = -kt+ln[A] b. ln[A] = -kt c.log [A]=-2.303 log kt**

 **d. log [A] = -kt + log [A]**

 **3. Name the complex- [Co(SCN)4]2-**

**a. Tetracyanocobaltate b.Tetrathiocyancobalt c.Tetrathiocyanocobalt d.Tetrathiocyanocobaltate**

 **4.** Why is geometrical isomerism not possible in tetrahedral complexes having two different types of unidentate ligands coordinated with the central metal ion?

 a. all ligands are same b.all ligands are arranged in same plane

 c. all ligands are arranged perpendicular to the plane d. all ligands are not same

 **5.** Arrange the following compounds in order of increasing reactivity towards nucleophilic substitution reactions.

a. 2, 4- Dinitrochlorobenzene;Chlorobenzene;4-Chloronitrobenzene b.4-Chloronitrobenzene;Chlorobenzene;2,4-Dinitrochlorobenzene c.Chlorobenzene;4-Chloronitrobenzene;2,4-Dinitrochlorobenzene

d. 2,4Dinitrochlorobenzene;4-Chloronitrobenzene; Chlorobenzene.

 **6. Why is the colour of the complex changed [Ti(H2O)6]Cl3 when it is heated?**

 **a. The unpaired electrons excited b. The electrons release energy**

 **c. The water molecule dissociate d. The water molecule evaporate**

**7. Recognize** the hybridization of the carbon attached with vinylic halides?

 a. sp b.sp2  c.sp3 d.sp2d

 **8.** What is the order of reactivity of alkyl halides towards SN1?

 a. 30>20>10  b.20>30>10 c.10<30<20  d.30<20<10

 **9.** Which one in the following pairs of substances undergoes SN2 substitution reaction faster?

 **a.** Chlorobenzene and 2-Bromopentane b. Benzylchloride and 2-Bromobutane c. Benzylchloride and 2-Bromopentane d. Benzyl chloride and 3-Bromopropane

 **10. Write down the product formed when HBr add to 3 methyl 1-butene.**

 **a. CH3CH(CH3)CH2CH2Br b. CH2(CH3)CH2CHBr**

 **c. CH3CH(Br)CH2CH3  d. CH3CH(Br)CHCH3**

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:** The order of reaction can be zero or fractional.
 **Reason:** The order of a reaction cannot be determined from a balanced chemical reaction.

**12. Assertion :**If a liquid solute more volatile than the solvent is added to the solvent, the vapour pressure of the solution may increase i.e., ps > po.
**Reason :** In the presence of a more volatile liquid solute, only the solute will form the vapours and solvent will not.

**13. Assertion :**When methyl alcohol is added to water, boiling point of water increases.
**Reason :**When a volatile solute is added to a volatile solvent elevation in boiling point is observed.

**14. What are not the conditions for optical isomerism?**

 **a. Chirality b. super-imposible images c.enantiomers**

 **d. dextro-rotatory**

**15.** Given below is the sketch of a plant for carrying out a process.

 Name the process occurring in the above plant.

 a. Osmosis b. Diffusion c. Reverse osmosis d. All the above

**16. Extend an example for pseudo first order reaction.**

 **a. Acid hydrolysis of ester b. Base hydrolysis of ester**

 **c. Hydrolysis of alkene d. All the above**

**17.** Predict the number of unpaired electrons in the square planar [Pt(CN)4]2– ion.

 a. 3 b.4 c.2 d.5

**18. Expand DDT**

 **a. Diphenyldichloroethane b. Dichlorodiphenyltrichloroethane**

 **c. Dichlorodiethane d. Dichlorodiphenyldichloroethane**

**SECTION-B**

**19. How will you convert Phenol to Anisole?**

**20. Give the reaction equations for Riemer-Tiemann reaction.**

**OR**

 **Give the Arrhenius equation with its expanded form.**

**21. Out of o- and p- dibromobenzene which one has higher melting point and why?**

**22. Give the test to classify the types of alcohols(with equation)**

**OR**

 **Calculate the mass of urea in making 2.5kg of 0.25 molal solution.**

**23. How to convert 2-bromobutane to 2-butene?**

**24. How is DDT prepared?**

**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. Calculate the mole fraction of ethylene glycol in a solution containing 20% of C2H6O2 by mass.**

**27. Derive the expression for half life period of zero order reaction.**

**28. A first order reaction has the rate constant of 1.15 x 10-3 s-1. How long will 5g of reactant reduce into 3g?**

 **29.** Draw the crystal field splitting for the complex [Co(CN)6]3+

 **30.** Explain the nature of bonding in [Ni(CN)4]2-  based on valence bond theory.

**SECTION-D**

31. Alcohols and phenols are the most important compounds used in our daily life. Alcohols are prepared by hydration of alkenes, fermentation of glucose, reduction of aldehydes, ketones, carboxylic acids, and esters.
Alcohols are soluble in water. Boiling points increase with an increase in molar mass and decrease with branching. Alcohols on dehydration give alkene at 443K, follow the carbocation mechanism. Excess of alcohol at 413K on dehydration with conc. H2SO4 also follows a carbocation mechanism but gives diethyl ether. Alcohols undergo nucleophilic substitution reactions, esterification with carboxylic acids and derivatives like amides, acid halides, acid anhydride Phenol is prepared from cumene, diazonium salts, anisole, chlorobenzene. Phenol is used to prepare salicylaldehyde, salicylic acid, aspirin, methyl salicylate, p-benzoquinone. Phenol undergoes electrophilic substitution reaction at o & p-position. Ethers are functional isomers of alcohols, have low boiling points. Ethers are used as solvents. Unsymmetrical ethers are prepared by Williamson synthesis. Ethers react with HI and undergo SN1 or SN2 mechanisms depending upon the stability of carbocation formed. Aromatic ethers like anisole undergo electrophilic substitution at o & p – position.

**1. The IUPAC name of CH3**

 **|**

 **CH3-C-CH2CH3**

 **|**

 **CH3**
(a) 2-methyl butanol
(b) 2-methyl butan-2-ol
(c) Methyl butan-2-ol
(d) 2-methyl propan-2-ol

**2.** **Out of tert, butyl alcohol, and**n**-butanol, which will undergo dehydration faster?**
(a) tert, butyl alcohol
(b) n-butanol
(c) Both have the same tendency
(d) None undergo dehydration

**3. Complete the reaction:**

**Phenol on oxidation produces**

4. **Why is C—OH bond length in CH3OH longer than C—OH bond length in phenol?**

**32. The following reaction, A----🡪 P+Q+R (The reactant A on heating gives P, Q and R as products) follows first order kinetics. The half-life period of the reaction is 69.3 s at 500 0C. The gas A is enclosed in the container at 500 0C and at the pressure of 0.4 atm.**

**1. Calculate the rate constant of the reaction**

**2. The total pressure of the system after 230s will be**

**a. 2.15 atm b.1.12 atm c. 0.4 atm d. 3.08 atm**

**3. The plot between ln[A] vs t will be**

**a. linear with slope=k b. linear with intercept = ln [A]0**

**c. lineqar with slope = ln [A]0 d. linear with intercept = [A]0**

**4. Give an example for first order kinetics**

**SECTION-E**

**36. 3,3 dimethylbutan-2-ol loses a molecule of water in the presence of concentrated sulphuric acid to give tetramethylethylene as the major product. Suggest a suitable mechanism.**

**37.**Primary alkyl halide C4H9Br (A) reacted with alcoholic KOH to give compound (B). Compounds (B) is reacted with HBr to give (C) which is an isomer of (A). When (A) is reacted with Na metal, it gives a compound (D), C8H18 which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (A) and write the equations for all reactions.

**38. What is crystal field splitting?** On the basis of crystal field theory explains why Co (III) forms a paramagnetic octahedral complex with weak field ligands whereas it forms a diamagnetic octahedral complex with strong field ligands