

GATEWAY

EDUCATION

Delhi-NCR, Sonipat

- Mock Test
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- Assignments
- Career Counseling
- How to Select Perfect Course/College after 12th?

MOCK TEST-2

Class XII

CHEMISTRY



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Class - XIITH
CHEMISTRY

MOCK EXAMS

Serial Number: 2

Time: 3 Hours

Maximum Marks: 70

Exam Date: _____

General Instructions:

Read the following instructions carefully and follow them:

- (i) This question paper contains 33 questions. All questions are compulsory.**
- (ii) Question paper is divided into five sections A, B, C, D and E.**
- (iii) Section A questions number 1 to 16 are multiple choice type questions. Each question carries 1 mark.**
- (iv) Section B questions number 17 to 21 are very short answer type questions. Each question carries 2 marks.**
- (v) Section C questions number 22 to 28 are short answer type questions. Each question carries 3 marks.**
- (vi) Section D questions number 29 and 30 are case-based questions. Each question carries 4 marks. Each question has subparts with internal choice in one of the subparts.**
- (vii) Section E questions number 31 to 33 are long answer type questions. Each question carries 5 marks.**
- (viii) There is no overall choice. However, an internal choice has been provided in Sections B, C and D of the question paper. A candidate has to write answer for only one of the alternatives in such questions.**
- (ix) Wherever necessary, neat and properly labelled diagrams should be drawn.**

Questions no. 1 to 16 are Multiple Choice Type Questions, carrying 1 mark each. (16X1=16)

1. Which of the following unit is useful in relating concentration of solution with its vapour pressure?

- (a) Mole fraction (b) Parts per million
(c) Mass percentage (d) Molality

2. Which of the following statements is not correct about an inert electrode in a cell?

- (a) It does not participate in the cell reaction.
(b) It provides surface either for oxidation or for reduction reaction.
(c) It provides surface for conduction of electrons.
(d) It provides surface for redox reaction.

3. The role of a catalyst is to change

- (a) Gibbs energy of reaction (b) enthalpy of reaction
(c) activation energy of reaction (d) equilibrium constant

4. The magnetic nature of elements depend on the presence of unpaired electrons. Identify the configuration of transition element, which shows the highest magnetic moment.

- (a) $3d^7$ (b) $3d^5$ (c) $3d^8$ (d) $3d^2$

5. Which of the following oxidation state is common for all lanthanoids?

- (a) +2 (b) +3 (c) +4 (d) +5

6. When 0.1 mol $\text{CoCl}_3(\text{NH}_3)_5$ is treated with excess of AgNO_3 , 0.2 mol of AgCl are obtained. The conductivity of solution will correspond to

- (a) 1:3 electrolyte
(b) 1:2 electrolyte
(c) 1:1 electrolyte
(d) 3:1 electrolyte

7. The correct IUPAC name of $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ is

- (a) diamminedichloridoplatinum (II)
(b) diamminedichloridoplatinum (IV)
(c) diamminedichloridoplatinum (I)
(d) dichloridodiammineplatinum (IV)

8. Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho and para halo compounds. The reaction is

- (a) electrophilic elimination reaction
(b) electrophilic substitution reaction
(c) free radical addition reaction

(d) nucleophilic substitution reaction

9. Monochlorination of toluene in sunlight followed by hydrolysis with aq. NaOH yields.

- (a) o-Cresol (b) w-Cresol
(c) 2, 4-Dihydroxytoluene (d) Benzyl alcohol

10. A first order reaction is 50% completed in 1.26×10^{14} s. How much time would it take for 100% completion?

- (i) 1.26×10^{15} s (ii) 2.52×10^{14} s
(iii) 2.52×10^{28} s (iv) infinite

11 CH₃CH₂OH can be converted into CH₃CHO by .

- (a) catalytic hydrogenation
(b) treatment with LiAlH₄
(c) treatment with pyridinium chlorochromate
(d) treatment with KMnO₄

12 Glycogen is a branched chain polymer of α-D-glucose units in which chain is formed by C1-C4 glycosidic linkage whereas branching occurs by the formation of

C1-C6 glycosidic linkage. Structure of glycogen is similar to

- (a) amylose (b) amylopectin (c) cellulose (d) glucose

Note: In the following questions a statement of assertion followed by a statement of reason is given.

Choose the correct answer out of the following choices.

- (i) Both assertion and reason are correct and the reason is correct explanation of assertion.
(ii) Both assertion and reason are correct but reason does not explain assertion.
(iii) Assertion is correct but reason is incorrect. (iv) Both assertion and reason are incorrect.
(v) Assertion is incorrect but reason is correct.

13. Assertion (A): Addition reaction of water to but-1-ene in acidic medium yields-

butan-1-ol.

Reason (R): Addition of water in acidic medium proceeds through the formation of primary carbocation.

14. Assertion (A): p-Nitrophenol is more acidic than phenol. Reason (R): Nitro group helps in the stabilization of the phenoxide ion by dispersal of negative charge due to resonance.

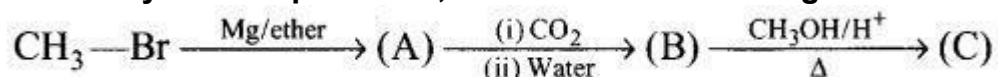
15. Assertion (A): The α -hydrogen atom in carbonyl compounds is less acidic. Reason (R): The anion formed after the loss of α -hydrogen atom in carbonyl compounds is more acidic.

16 Assertion (A): Aldehydes and ketones, both react with Tollen's reagent to form silver mirror.

Reason (R): Both, aldehydes and ketones contain a carbonyl group.

SECTION: B

17. Identify the compounds A, B and C in the following reaction.



OR

a. A soda bottle will go flat (lose its fizz) faster in Srinagar than in Delhi. Is this statement correct? Why or why not?

b. How does sugar help in increasing the shelf life of the product?

18 Why are carboxylic acids more acidic than alcohols or phenols although all of them have hydrogen atom attached to an oxygen atom (-O-H)?

19 How do you explain the presence of all six carbon atoms in glucose in a straight chain?

20. Under what conditions glucose is converted to gluconic and saccharic acid?

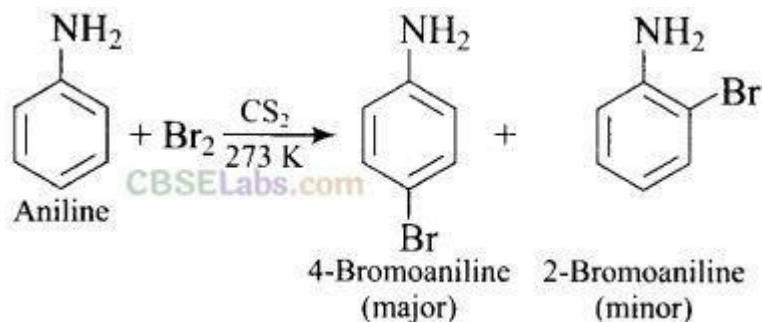
21 Why is NH₂ group of aniline acetylated before carrying out nitration?

SECTION C

22. a. Explain why is MeNH₂ stronger base than MeOH?

b. What is the role of pyridine in the acylation reaction of amines?

23. Predict the product of reaction of aniline with bromine in non-polar solvent such as CS₂.



24 a. Give the chemical reaction involved when p-nitrotoluene undergoes Etard reaction.

b. Why does Benzoic acid exist as a dimer in an aprotic solvent?

c. Benzene on reaction with methylchloride in the presence of anhydrous AlCl₃ forms toluene. What is the expected outcome if benzene is replaced by benzoic acid? Give a reason for your answer.

OR

An organic compound 'X', does not undergo aldol condensation. However 'X' with compound 'Y' in the presence of a strong base react to give the compound 1,3-diphenylprop-2-en-1-one. a. Identify 'X' and 'Y'

b. Write the chemical reaction involved.

c. Give one chemical test to distinguish between X and Y.

25. Components of a binary mixture of two liquids A and B were being separated by distillation. After some time separation of components stopped and composition of vapour phase became same as that of liquid phase. Both the components started coming in the distillate. Explain why does this happen?

26. Unlike dry cell, the mercury cell has a constant cell potential throughout its useful life. Why?

27. Why are aryl halides less reactive towards nucleophilic substitution reactions than alkyl halides? How can we enhance the reactivity of aryl halides?

28 . For a certain reaction, large fraction of molecules has energy more than the threshold energy, yet the rate of reaction is very slow. Why?

Section D

The following questions are case-based questions. Each question has an internal choice and carries 4 (2+1+1) marks each. Read the passage carefully and answer the questions that follow

Q29. Read the passage given below and answer the following questions:

To explain bonding in coordination compounds various theories were proposed. One of the important theory was valence bond theory. According to that, the central metal ion in the complex makes available a number of empty orbitals for the formation of coordination bonds with suitable ligands. The appropriate atomic orbitals of the metal hybridise to give a set of equivalent orbitals of definite geometry. The d-orbitals involved in the hybridisation may be either inner d-orbitals i.e., (n - 1) d or outer d-orbitals i.e., nd. For example, Co^{3+} forms both inner orbital and outer orbital complexes, with ammonia it forms $[\text{Co}(\text{NH}_3)_6]^{3+}$ and with fluorine it forms $[\text{CoF}_6]^{3-}$ complex ion.

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Which of the following is not true for $[\text{CoF}_6]^{3-}$?

- (a) It is paramagnetic. (b) It has coordination number of 6. (c) It is outer orbital complex. (d) It involves d^2sp^3 hybridisation.

Which of the following is true for $[\text{Co}(\text{NH}_3)_6]^{3+}$?

- (a) It is an octahedral, diamagnetic and outer orbital complex.
(b) It is an octahedral, paramagnetic and outer orbital complex.
(c) It is an octahedral, paramagnetic and inner orbital complex. (d) It is an octahedral, diamagnetic and inner orbital complex.

(iii) The paramagnetism of $[\text{CoF}_6]^{3-}$ is due to

- (a) 3 electrons (b) 4 electrons (c) 2 electrons (d) 2 electrons

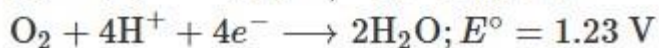
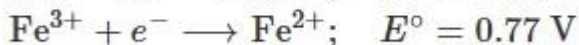
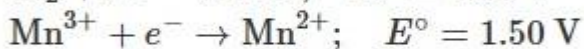
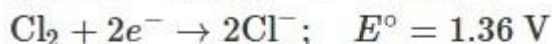
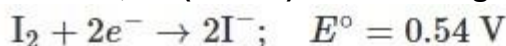
Or

Read the passage given below and answer the following questions:

Standard electrode potentials are used for various processes:

- (i) It is used to measure relative strengths of various oxidants and reductants.
(ii) It is used to calculate standard cell potential.
(iii) It is used to predict possible reactions.

A set of half-reactions (in acidic medium) along with their standard reduction potential, E° (in volt) values are given below



The following questions are multiple choice questions. Choose the most appropriate answer:

(i) Which of the following statements is correct?

- (a) Cl^- is oxidised by O_2 (b) Fe^{2+} is oxidised by iodine
(c) I^- is oxidised by chlorine. (d) Mn^{2+} is oxidised by chlorine

(ii) Mn^{3+} is not stable in acidic medium, while Fe^{3+} is stable because

- (a) O_2 oxidises Mn^{2+} to Mn^{3+}
(b) O_2 oxidises both Mn^{2+} to Mn^{3+} and Fe^{2+} to Fe^{3+}
(c) Fe^{3+} oxidises H_2O to O_2
(d) Mn^{3+} oxidises H_2O to O_2

(iii) The strongest reducing agent in the aqueous solution is

- (a) I^- (b) Cl^- (c) Mn^{2+} (d) Fe^{2+}

30. Read the passage given below and answer the following questions:

At 298 K, the vapour pressure of pure benzene, C_6H_6 is 0.256 bar and the vapour pressure of pure toluene

$\text{C}_6\text{H}_5\text{CH}_3$ is 0.0925 bar. Two mixtures were prepared as follows:

- (i) 7.8 g of C_6H_6 + 9.2 g of toluene
(ii) 3.9 g of C_6H_6 + 13.8 g of toluene

The following questions are multiple choice questions. Choose the most appropriate answer:

(i) The total vapour pressure (bar) of solution 1 is

- | | | | |
|-----------|-----------|-----------|-----------|
| (a) 0.128 | (b) 0.174 | (c) 0.198 | (d) 0.258 |
|-----------|-----------|-----------|-----------|

(ii) Which of the given solutions have higher vapour pressure?

- | | |
|-------------------------------------|-------------------------|
| (a) I | (b) II |
| (c) Both have equal vapour pressure | (d) Cannot be predicted |

(iii) Mole fraction of benzene in vapour phase in solution 1 is

(a) 0.128	(b) 0.174	(c) 0.734	(d) 0.266
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SECTION E

The following questions are long answer types and carry 5 marks each. All questions have an internal choice.

31. All energetically effective collisions do not result in a chemical change. Explain with the help of an example

OR

When a chromite ore (A) is fused with sodium carbonate in free excess of air and the product is dissolved in water, a yellow solution of compound (B) is obtained. After treatment of this yellow solution with sulphuric acid, compound (C) can be crystallized from the solution. When compound (C) is treated with KCl, orange crystals of compound (D) crystallise out. Identify A to D and also explain the reactions.

32 a. Give reasons for the following:

- (i) Out of o- and p-dibromobenzene, which one has higher melting point and why?
- (ii) Why has iodoform appreciable antiseptic property?
- (iii) Haloarenes are less reactive than haloalkanes and haloalkenes.

Explain.

OR

1. Explain why alcohols and ethers of comparable molecular mass have different boiling points.
2. Explain why are low molecular mass alcohols soluble in water?
3. Write the mechanism of the reaction of HI with methoxybenzene.

33.1. Carboxylic acids contain carbonyl group but do not show the nucleophilic addition reaction like aldehydes or ketones. Why?

2. Alkenes ($>C = C<$) and carbonyl compounds ($>C = O$), both contain a π bond but alkenes show electrophilic addition reactions whereas carbonyl compounds show nucleophilic addition reactions. Explain.
3. Arrange the following in decreasing order of their acidic strength. Give

explanation for the arrangement.
 C_6H_5COOH , FCH_2COOH , NO_2CH_2COOH

OR

Write down functional isomers of a carbonyl compound with molecular formula C_3H_6O . Which isomer will react faster with HCN and why? Explain the mechanism of the reaction also. Will the reaction lead to the completion with the conversion of whole reactant into product at reaction conditions? If a strong acid is added to the reaction mixture what will be the effect on concentration of the product and why?

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