



CHEMISTRY

BOOKS - ACCURATE PUBLICATION

MODEL TEST PAPER-1

Section A Mcq

1. The molality of pure water is

A. 55.5

B. 20

C. 18

D. 10

Answer:



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2. If limiting molar conductivity of Ca^{2+} and Cl^{-} are 119.0 and $76.3 \text{ S cm}^2\text{mol}^{-1}$, then the value of limiting molar conductivity of $CaCl_2$ will be :

A. $195.3 \text{ Scm}^2 \text{ mol}^{-1}$

B. $271.6 \text{ Scm}^2 \text{ mol}^{-1}$

C. $43.3 \text{ Scm}^2 \text{ mol}^{-1}$

D. $314.3 \text{ Scm}^2 \text{ mol}^{-1}$

Answer:



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3. When the solute is present in trace quantities, the following expression is used

- A. Gram per million
- B. milligram percent
- C. microgram percent
- D. parts per million

Answer:



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4. Low concentration of oxygen in the blood and tissues of people living. At high altitude is due to:

A. Low temperature

B. Low atmospheric Pressure

C. high atmospheric pressure

D. both low atmospheric pressure and high
atmospheric pressure

Answer:



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5. Considering the formation, breaking and strength of hydrogen bond, Predict which of the following mixtures will show a positive deviation from Raoult's law ?

- A. Methanol and acetone
- B. Chloroform and acetone
- C. Nitric acid and water
- D. Phenol and aniline

Answer:



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6. Which of the following Noble gases is radioactive:

A. Xenon

B. Argon

C. Neon

D. Radon

Answer:



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7. Anomalous electronic configuration in the 3d series are of

A. Cr and Fe

B. Cu and Zn

C. Fe and Cu

D. Cr and Cu

Answer:



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8. In Werner's coordination theory, He isolated
..... compounds :

A. cobalt

B. copper

C. silver

D. zinc

Answer:



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9. Primary valency expresses ?

A. co-ordination number

B. oxidation state

C. counter ions

D. geometry

Answer:



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10. The central oxygen atom in ether is :

A. sp -hybridized

B. sp^2 -hybridized

C. sp^3 -hybridized

D. sp^3d^2 - hybridized

Answer:



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11. Reduction of $> C = O$ to CH_2 can be carried out with :

A. Catalytic reduction

B. $\text{Na}/\text{C}_2\text{H}_5\text{OH}$

C. $\text{NH}_2\text{NH}_2 / \text{KOH}$

D. LiAlH_4

Answer:



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12. During reduction of carbonyl compound by H_2NNH_2 and KOH the first intermediate is :

A. $RC=N$

B. $RCH = NNH_2$

C. $RCH=NH$

D. $RCONH_2$

Answer:



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13. Cross aldol condensation occurs between

A. Two same aldehydes

B. Two same ketones

C. Two different aldehydes and ketones

D. None of these

Answer:



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14. Vinegar is solution of acetic acid which is :

A. 15 -20 %

B. 20-25%

C. 6-8 %

D. 2-4%

Answer:



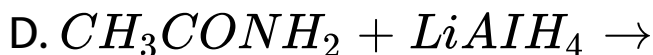
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15. Translate the following statements into chemical equation and balance the equations :
phosphorous burns in oxygen to give phosphorous pentaoxide.



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16. Which of the following reactions will not give a primary amine?



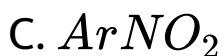
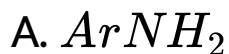
Answer:



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17. Hoffmann bromamide degradation reaction

is shown by



Answer:



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18. Translate the following statements into chemical equation and balance the equations :
aluminium metal replaces iron from ferric oxide (Fe_2O_3) giving aluminium oxide and iron.



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19. The density of 2.05 M acetic acid in water is 1.02 g/ml . Calculate the molality of solution.

A. 3.29

B. 0.229

C. 22.9

D. 2.29

Answer:



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20. What mass (in grams) of nickel could be electroplated from a solution of nickel (II) chloride by a current of 0.25 amperes flowing for 10 hours ?

A. 12 g

B. 5.5 g

C. 0.046 g

D. 2.7 g

Answer:



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21. Molal elevation constant is also called as

A. Cryoscopic Constant

B. gas constant

C. Ebullioscopic constant

D. freezing point depression constant

Answer:



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22. Which of the following mixture does not show positive deviation from the Raoult,s Law?

A. Benzene+ acetone

B. Acetone+ ethanol

C. Acetone+ chloroform

D. Water+ ethanol

Answer:



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23. Write complete balanced equation for the following reaction : ammonia + copper oxide
→ copper + nitrogen + water



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24. Write complete balanced equation for the following reaction : aluminium sulphate + sodium hydroxide \rightarrow aluminium hydroxide + sodium sulphate



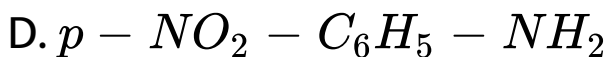
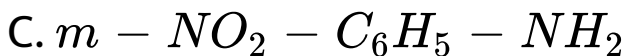
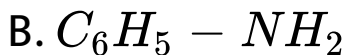
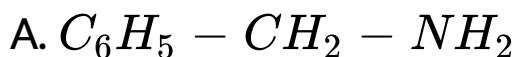
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25. Write complete balanced equation for the following reaction : nitric acid + calcium hydroxide \rightarrow calcium nitrate + water



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26. Which of the following is strongest base ?



Answer:



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27. The property which is not characteristic of transition metals is

- A. variable oxidation states
- B. tendency to form complexes
- C. formation of coloured compounds
- D. natural radioactivity.

Answer:



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28. Pick out the correct statement with respect to $[Cr(NH_3)_6]^{3+}$

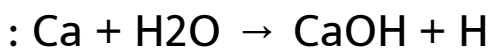
- A. It is sp^2d^2 hybridised, tetrahedral
- B. It is d^2sp^3 hybridised, octahedral
- C. It is dsp^2 hybridised, square planar
- D. It is sp^3d^2 hybridised octahedral

Answer:



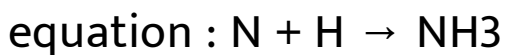
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29. Correct and balance the following equation



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30. Correct and balance the following



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31. Write balanced equation from following equation : lime water reacts with carbon dioxide gas to produce calcium carbonate and water



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32. Write balanced equation from following equation : aluminium burns in chlorine to give aluminium chloride



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33. Which of the following gives aldol condensation reaction?

- A. Formaldehyde
- B. Acetaldehyde
- C. Dimethyl ketone
- D. Propionaldehyde

Answer:



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34. Balance the following equation : $\text{MnO}_2 + \text{HCl} \rightarrow \text{MnCl}_2 + \text{Cl}_2 + \text{H}_2\text{O}$



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35. In nucleic acids, the sequence is

A. phosphate - base - sugar

B. sugar- base-phosphate

C. base- sugar - phosphate

D. base- phosphate - sugar

Answer:



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36. The segment of DNA which acts as the instrumental manual for the synthesis of the protein is:

A. ribose

B. ribose

C. nucleoside

D. nucleotide

Answer:



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Section A Passage

1. Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to 100 nm consisting of dispersed phase and

dispersion medium. The dispersed phase or dispersion medium may be solid, liquid or even a gas. Depending upon the nature of dispersion medium or dispersed phase, 8 types of systems are possible except for a gas dispersed in another gas because the gases are completely miscible with each other. The substances which have strong interaction with the dispersion medium are called lyophilic colloids while those which do not pass into colloidal state readily are called lyophobic colloids. Lyophobic sols are much less stable

and are irreversible .

What is the size of colloidal particles?



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2. Read the given passage and answers following questions :

Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to

100nm consisting of dispersed phase and dispersion medium. The dispersed phase or dispersion medium may be solid, liquid or even a gas. Depending upon the nature of dispersion medium or dispersed phase, 8 types of systems are possible except for a gas dispersed in another gas because the gases are completely miscible with each other. The substances which have strong interaction with the dispersion medium are called lyophilic colloids while those which do not pass into colloidal state readily are called lyophobic colloids. Lyophobic sols are much less stable

and are irreversible.

Answer the following questions :

How many types systems are possible depending upon the nature of dispersion medium?



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3. Translate the following statements into chemical equation and balance the equations :
barium chloride reacts with zinc sulphate to give zinc chloride and barium sulphate.



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4. Balance the equations : $\text{Na} + \text{O}_2 \rightarrow \text{Na}_2\text{O}$



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5. Thomas Graham in 1861, during his work on diffusion found that certain substances such as gelatin, albumin, glue, etc. Diffused at very low rate and were called colloids. The colloid particles have the size in the range of 1 to 100 nm consisting of dispersed phase and

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and are irreversible .

Which type of colloids are more stable ?



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6. Adsorption is surface phenomenon, while absorption concerns with the whole mass of the absorbent.

In adsorption, the substance is only retained on the surface and does not go into the bulk or interior of the solid or liquid. Absorption implies that substance is uniformly distributed

throughout the body of the solid or liquid.

In adsorption, the concentration of the adsorbed molecules is always greater in the immediate vicinity of the surface than in the free phase. Absorption involves bulk penetration of the molecules into the structure of the solid or liquid by some process of diffusion.

Adsorption is a rapid process and equilibrium is attained in a short time. In absorption the equilibrium takes place slowly.

Such substance is said to be sorbed and the

phenomenon is known as sorption.

What is phenomenon of adsorption.



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7. Balance the chemical equation : $\text{MgCO}_3 + \text{HCl} \rightarrow \text{MgCl}_2 + \text{CO}_2 + \text{H}_2\text{O}$



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8. Balance the chemical equation : $\text{Mg} + \text{CO}_2 \rightarrow \text{MgO} + \text{C}$



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9. Adsorption is surface phenomenon, while absorption concerns with the whole mass of the absorbent.

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What is the phenomenon of adsorption ?



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How does equilibrium affects by adsorption ?



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1. Secondary amines don't evolve N_2 with nitrous acid. Explain



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2. Aldehydes are easily oxidised than ketones.



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3. Why formaldehyde is more reactive than Acetone ?



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4. Why Phenols are more acidic than Alcohol ?



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5. True or False :Vitamin K is also called as ascorbic acid.



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6. Acetanilide is less basic than aniline.



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7. Boiling point of iodobenzene is more than that of bromobenzene.



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8. Boiling point of iodobenzene is more than that of bromobenzene.



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9. Phenetol reacts with HI at 373 K to give ethanol and iodobenzene.



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10. Uracil occurs in DNA and not in RNA.



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1. Why transition metal have tendency to form many complexes ?



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2. Write the general electronic configuration of transition elements.



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3. Explain hydrate isomerism with the help of an example.



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4. Explain

Functional group isomerism



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5. Balance the equations $\text{Mg}(\text{OH})_2 + \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2\text{O}$



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6. Write the IUPAC name of $K_3[Cr(C_2O_4)_3]$.



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7. Balance the equations $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}_2$



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8. Why ClF_3 exists, but FCl_3 does not exist ?



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9. What is the difference between nucleoside and nucleotide ?



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10. 4L of 0.02 M aqueous solution of NaCl was diluted by adding one litre of water. The molality of the resultant solution is _____



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11. 18 g of glucose is dissolved in 1 kg of water. At what temperature will the solution boil ? (K_b for water is $0.52 \text{ K kg mol}^{-1}$)



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12. What is the time required for a first order reaction to be 99 % complete, compared to the time taken for the reaction to be 90 % complete ?



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13. For a reaction having rate law expression $\text{Rate} = k[A]^{3/2}[B]^{-1/2}$. If the concentration of both A and B becomes four times, the rate of reaction:

- A. becomes 4 times
- B. becomes 16 times
- C. decreases 4 times
- D. remains same

Answer:



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14. Give one example of zero order reaction.



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15. Why are halogens coloured ?



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16. SF_6 is known but SCl_6 is not known.

Explain.



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17. 2.1 g of non-electrolyte solute (molar mass 250 g/mol) was dissolved in 5.12 g of benzene.

If the freezing point of depression constant, k_f of benzene is 5.12 K kg/mol , Calculate the freezing point of solution if freezing point of pure benzene is 5.5°C .



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18. Dissolving 120g of urea (mol.wt 60) in 1000g of water gave a solution of density 1.15g/ml. The molarity of solution is:



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19. Explain

ligand



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20. Explain

bridging ligand.



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21. Explain the geometry of $[Ni(CO)_4]$ on basis of VBT.



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22. Write the difference between molecularity and order of reaction?



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23. Among noble gases Xenon forms maximum number of compounds, why ?



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24. Explain the variation in molar conductivity of weak electrolyte with concentration.



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25. $[Ti(H_2O)_6]^{3+}$ is coloured while $[Sc(H_2O)_6]^{3+}$ is colourless. Explain.



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26. If $t_{1/2}$ is 0.693 sec. for a first order reaction. Calculate reaction rate constant.



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27. Prove that $t_{75} = 2t_{50}$ for 1^{st} order reaction.



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28. Why are Mn^{2+} compounds more stable than Fe^{2+} compounds towards oxidation to their +3 state ?



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29. Write differences between ideal and non-ideal solutions.



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30. Write down the units of K_b ?



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31. Difference between osmosis and diffusion.



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32. Mixture of acetone and chloroform shows negative deviation from Raoult's law. Why?





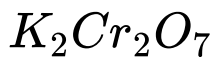
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33. How does SO_2 react with



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34. How does SO_2 react with



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35. Draw the structures of XeO_4



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36. Draw the structure of $XeOF_2$



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37. Bleaching action of Cl_2 is permanent while that of SO_2 is temporary. Why?



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Section C Long Answer Questions

1. Why alcohols are weaker acids than water ?



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2. Explain Dow 's process .



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3. Explain the following reactions:

Diazotisation reaction.



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4. Explain the following reactions :

Kolbe's reaction.



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5. The reaction $2NO_2O_5 \rightarrow 4NO_2 + O_2$ forms NO_2 at the rate of $0.0072 \text{ mol } L^{-1} s^{-1}$ after a certain time.

What is the rate of change of $[O_2]$ at this time?



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6. The reaction $2N_2O_5 \rightarrow 4NO_2 + O_2$ forms NO_2 at the rate of $0.0072 \text{ mol } L^{-1} s^{-1}$ after a certain time.

What is the rate of change of $[N_2O_5]$ at this time ?



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7. Balance the equations $Fe + O_2 \rightarrow Fe_2O_3$



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8. A first order reaction is 20 % complete in 10 minutes. Calculate

Specific rate constant of the reaction



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9. A first order reaction is 20% complete in the 10 minutes. Calculate the time period for 75% completion of the reaction.



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10. Write The Nernst equation and calculate the e.m.f. of the following cell at 298K.



Given $E_{Fe^{2+}/Fe}^{\circ} = -0.44V$



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11. Why is dioxygen gas but sulphur a solid?



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12. Write NERNST equation also Calculate the cell e.m.f. and ΔG for the cell reaction at $25^{\circ}C$



Given

$$E_{Cr^{3+} / Cr}^0 = -0.75V, E_{Fe^{2+} / Fe}^0 = -0.45V$$



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13. The resistance of 0.05 M NaOH solution in a cell having length 5 cm area of cross section 10 cm² is 5.55×10^3 ohm. Calculate its molar conductance.



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14. How will you convert phenol into phenolphthalein, picric acid and salol.



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15. Write the following reactions

Distinguish test for 1° , 2° , 3° alcohols



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16. Write the following reactions

Convert chlorobenzene into phenol



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17. The rate constant for a first order reaction is 60S^{-1} . How much time will it take to reduce the concentration of the reactant to $\frac{1}{20^{\text{th}}}$ of its initial value ?



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18. A first order reaction is 20% complete in the 10 minutes. Calculate the time period for 75% completion of the reaction.



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19. Why the acid strengths of acids increase in the order :



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Section D Long Answer Questions Type II

1. Explain the following reactions:

Balz Schiemann reaction.



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2. Explain the following reaction reaction :

Sandmeyer's reaction.



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3. Write the following reactions :

Groves process.



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4. Explain the following reaction :

Gattermann reaction.



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5. Explain the following reactions :

Ulmann reaction



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6. Balance the equations $\text{CaCO}_3 + \text{HCl} \rightarrow \text{CaCl}_2$
 $+ \text{H}_2\text{O} + \text{CO}_2$



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7. What are ambident nucleophiles ? Explain with an example.



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8. Write complete balanced equation for the following reaction : calcium + water \rightarrow calcium hydroxide + hydrogen



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9. Transition metals form alloys with other transition metals. Explain.



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10. $[Ti(H_2O)_6]^{3+}$ is coloured while $[Sc(H_2O)_6]^{3+}$ is colourless. Explain.



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11. Why is $La(OH)_3$ more basic than $Lu(OH)_3$?



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12. Give the following reactions:

Fitting reaction



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13. Write Wurtz reaction.



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14. Explain the following reactions :

Ulmann reaction



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15. Write the following reactions :

Swarts reaction



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16. Explain:

S_N2 mechanism by taking example.



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17. How will you convert :

Chlorobenzene to 1,2 dichlorobenzene



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18. How will you convert:

But-1-ene to But-2-ene



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19. How will you convert:

Chlorobenzene to Benzoic acid



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20. How will you convert :

Acetic acid into ethane



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21. How will you convert :
methane into chloroform



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22. Why transition metals show catalytic properties?



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23. Transition metals form number of interstitial compounds. Explain.



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24. Write any two consequences of lanthanoids contraction.



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25. Most of transition metals show variable oxidation states. Explain



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26. Briefly explain, why are electronic configuration of lanthanides not known with certainty ?



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