



# CHEMISTRY

**BOOKS - KUMAR PRAKASHAN KENDRA**

**CHEMISTRY (GUJRATI ENGLISH)**

**BOARD EXAM QUESTION PAPER**

**MARCH - 2020**

**Part A**

1. Which of the following is an example of a solid solution in which the solute is a gas ?

- A. Amalgam of mercury with sodium
- B. Camphor in nitrogen gas
- C. Solution of hydrogen in palladium
- D. Oxygen dissolved in water

**Answer: C**



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2. We have three aqueous solutions of NaCl labelled as 'A', 'B' and 'C' with concentrations 0.1 M, 0.01 M and 0.001 M, respectively. The value of van't Hoff factor for these solutions will be in the order .....

A.  $i_C = i_B = i_A$

B.  $i_C > i_B > i_A$

C.  $i_A > i_C > i_B$

D.  $i_B > i_A > i_C$

**Answer: B**





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3. An electrochemical cell can behave like an electrolytic cell when .....

A.  $E_{cell} < E_{ext}$ .

B.  $E_{cell} I > E_{ext}$ .

C.  $E_{cell} = E_{ext}$ .

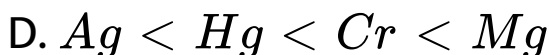
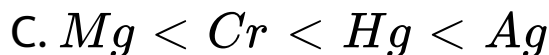
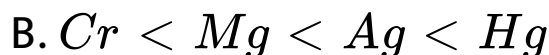
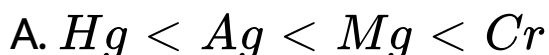
D.  $E_{cell} = 0$

**Answer: A**



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4. Which is increasing order of the reducing power of the following metals on the basis of standard electrode potential ?



**Answer: D**



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5.  $\Delta_m^\circ(HAc)$  is equal to .....

A.  $\Delta_m^\circ(AcH) + \Delta_m^\circ(KAc) + \Delta_m^\circ(NaAc)$

B.  $\Delta_m^\circ(HCl) + \Delta_m^\circ(NaAc) - \Delta_m^\circ(NaCl)$

C.  $\Delta_m^\circ(KCl) + \Delta_m^\circ(KAc) - \Delta_m^\circ(HCl)$

D.  $\Delta_m^\circ(KCl) + \Delta_m^\circ(NaAc) - \Delta_m^\circ(NaCl)$

**Answer: B**



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6. While charging the lead storage battery :

A.  $PbSO_4$  on cathode is changed to Pb.

B.  $PbSO_4$  on anode is changed to Pb

C.  $PbSO_4$  on cathode is changed to  $PbO$ .

D.  $PbSO_4$  on anode is changed to  $PbO_2$ .

**Answer: B**



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7. The decomposition of  $NH_3$  on platinum surface is zero order reaction. What is the rate of production of

$N_2$  if  $K = 2.5 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$  ?

A.  $2.5 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$

B.  $8.3 \times 10^{-5} \text{ mol L}^{-1} \text{ S}^{-1}$

C.  $7.5 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$

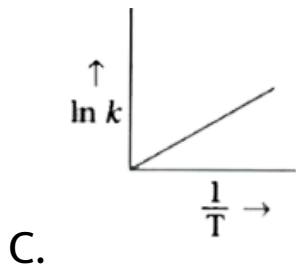
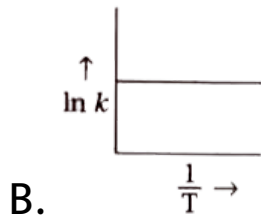
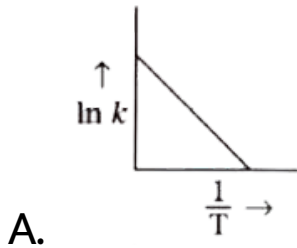
D.  $5 \times 10^{-4} \text{ mol L}^{-1} \text{ S}^{-1}$

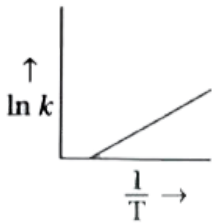
**Answer: A**





8. Which of the following graph for  $\ln k \rightarrow \frac{1}{T}$  is correct ?





D.

**Answer: A**



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9. The role of catalyst is to change .....

A. Gibbs energy of reaction

B. Enthalpy of reaction

C. Equilibrium constant of the reaction

D. Activation energy of the reaction

**Answer: D**



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**10.** Extent of adsorption of adsorbate from solution phase increases with .....

A. Decrease in surface of the adsorbent

B. Decrease in temperature

C. Decrease in concentration of adsorbate

D. Increase in temperature

**Answer: B**



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**11.** In Haber's process for manufacture of ammonia which metals acts as a promotor for iron ?

A. Cu

B. Zn

C. Mo

D. As

**Answer: C**



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**12.** Which of the following electrolytes will have maximum coagulating value for  $AgI / Ag^+$  sol ?

A.  $Na_3PO_4$

B.  $Na_2S$

C.  $Na_2SO_4$

D. NaCl

**Answer: D**



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**13.** Which of the following statements is correct about the role of substances added in the forth flotation process ?

A. Collectors enhance the non-wettability of the ore particle.

B. Froth stabilizers increases non-wettability of the gangue.

C. Depressants mixes the different sulphides.

D. Water wetted the ore particles.

**Answer: A**



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14. Copper matte is the mixture of .....

A. Copper (II) sulphide + Iron (II) sulphide

B. Copper (I) sulphide + Iron (I) sulphide

C. Copper (II) sulphide + Iron (I) sulphide

D. Copper (I) sulphide + Iron (II) sulphide

**Answer: D**



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15. Extraction of gold and silver involves leaching the metal with  $CN^-$  ion. The metal is later recovered by .....

- A. Displacement method
- B. Calcination
- C. Roasting
- D. Thermal decomposition

**Answer: A**



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**16.** How many numbers of  $\sigma$  and  $\pi$  bonds are in cyclotrimetaphosphoric acid molecules respectively ?

A. 12 and 6

B. 15 and 3

C. 14 and 4

D. 16 and 8

**Answer: B**



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17. Which of the following element does not react with oxygen directly ?

A. Zn

B. Ti

C. Pt

D. Fe

**Answer: C**



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18. In equation  $XeF_6 + 3H_2O \rightarrow$ , Xe containing product is .....

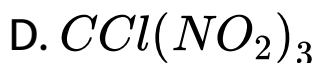
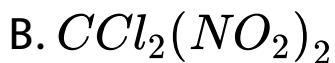
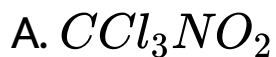


**Answer: D**



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19. Molecular formula of Tear gas is .....



**Answer: A**



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20. The magnetic moment of a divalent ion in aqueous solution if its atomic number is 25 :

A. 2.84 BM

B. 5.92 BM

C. 4.90 BM

D. 3.87 BM

**Answer: B**



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21. Which of the following is amphoteric oxide

?

$Mn_2O_7$ ,  $CrO_3$ ,  $Cr_2O_3$ ,  $CrO$ ,  $V_2O_5$ ,  $V_2O_4$

A.  $V_2O_5$ ,  $Cr_2O_3$

B.  $CrO_3$ ,  $V_2O_4$

C.  $Mn_2O_7$ ,  $CrO$

D.  $Cr_2O_3$ ,  $Mn_2O_7$

**Answer: A**



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22. Which of the following element having one electron in 5d orbital in its electronic configuration ?

A. Pm

B. Tb

C. Nd

D. Gd

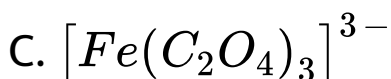
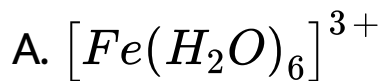
**Answer: D**



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23. Which of the following is the most stable complex ?

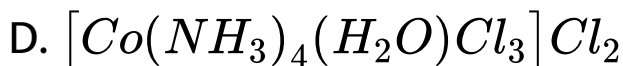
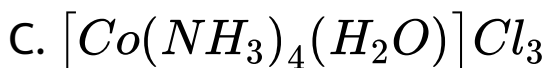
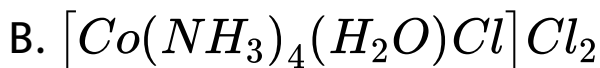
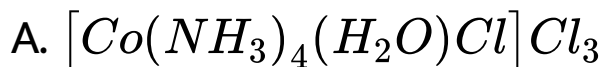


**Answer: C**



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24. Molecular formula of tetraammineaquachloridocobalt(III) chloride is .....



**Answer: B**



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25. Which of the following compound has highest reactivity towards  $S_N1$  reaction ?



**Answer: A**



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26. Which of the following has the highest dipole moment ?



**Answer: A**



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27. The position of -Br in the compound in  $CH_3CH = CHC(Br)(CH_3)_2$  can be classified as .....

A. Benzyl

B. Aryl

C. Vinyl

D. Allyl

**Answer: D**



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28. The IUPAC name of the major organic product of the reaction :



A. 1,2-Dibromobutane

B. 2,2-Dibromobutane

C. 1-Bromobutane

D. 2-Bromobutane

**Answer: C**



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29. Possible isomers of monohydric phenol having molecular formula  $C_7H_8$  are .....

A. 3

B. 4

C. 1

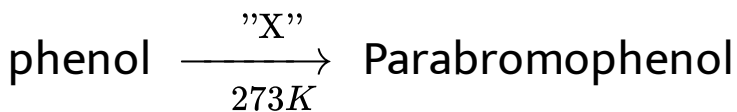
D. 2

**Answer: A**



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30. The reagent (X) in the given reaction is



A.  $Br_2 / CH_3COOH$

B.  $Br_2 / FeBr_3$

C. Bromine water

D.  $Br_2 / CS_2$

**Answer: D**



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31. Which of the following compound has highest boiling point ?

A. Butan-2-ol

B. Butan-1-ol

C. Pentan-1-ol

D. Propan-1-ol

**Answer: C**



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32. Conjugate base of which of the following acid is weak ?



**Answer: B**



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**33.** Sodium salt of which acid is used as food preservative ?

A. Phthalic acid

B. Adipic acid

C. Formic acid

D. Benzoic acid

**Answer: D**



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34. Which of the following compound does not give reaction with Hinsberg's reagent ?

- A. Triethyl amine
- B. Tertiary butyl amine
- C. N-methyl aniline
- D. 1-methyl cyclohexylamine

**Answer: A**



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35. .... compound gives Hofmann bromamide reaction.

A. Ethyl cyanide

B. Ethenoic acid

C. Ethenamide

D. Ethenamine

**Answer: C**



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36.

The

reaction



named as .....

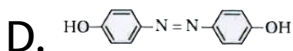
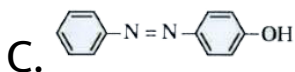
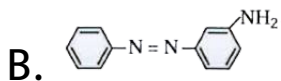
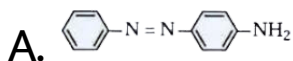
- A. Sandmeyer reaction
- B. Gatterman reaction
- C. Claisen reaction
- D. Carbylamine reaction

**Answer: B**



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37. Which of the following is structural formula of orange dye ?



**Answer: C**



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38. .... vitamin cannot be stored in a body.

A. D

B. C

C. A

D. K

**Answer: B**



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**39.** Which of the following base is not present in DNA ?

A. Uracil

B. Adenine

C. Guanine

D. Thymine

**Answer: A**



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40. Which of the following pair of protein is globular protein ?

P-kertain, Q-Insulin, R-myosin, S-albumin

A. P, R

B. Q, R

C. R, S

D. Q, S

**Answer: D**



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**41.** Thyroxine is iodinated derivative of which amino acid ?

A. Tyrosine

B. Cysteine

C. Glutamine

D. Tryptophan

**Answer: A**



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42. Which of the following statement is correct ?

A. Terylene is an addition polymer.

B. Buna-N is a copolymer.

C. Nylon-2-Nylon-6 is non-biodegradable polymer.

D. Nylon-6 is polyester type of polymer.

**Answer: B**



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43. Which are monomers of polymer having structure  $(NH - CO - NH - CH_2)_n$  ?

A. Acetamide, Formaldehyde

B. Acetamide, Methenamine

C. Urea, Formaldehyde

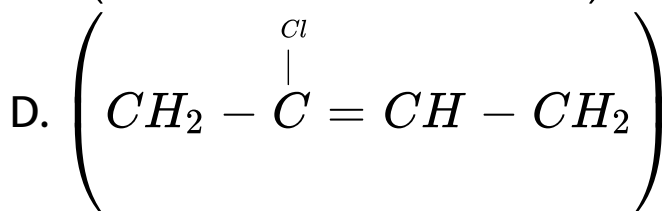
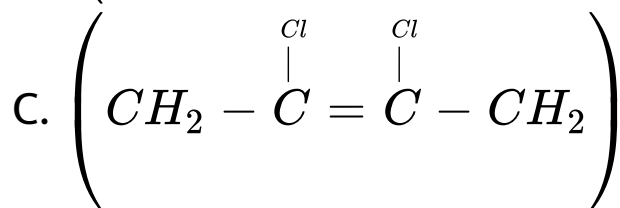
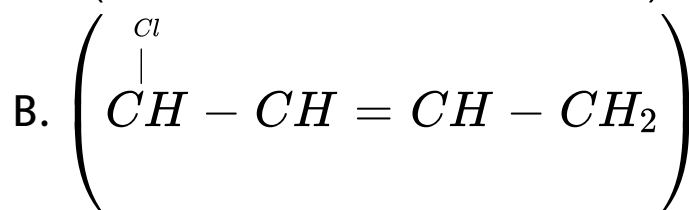
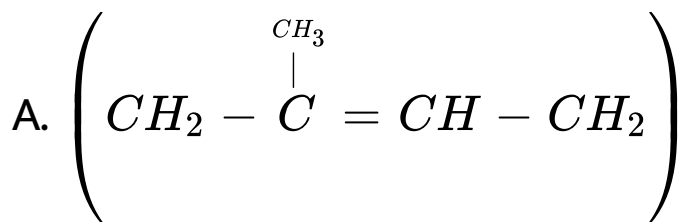
D. Urea, Ammonia

**Answer: C**



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44. Which is the repeating unit in Neoprene ?



**Answer: D**



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45. Equanil is .....

A. Artificial sweetener

B. Tranquilizer

C. Antihistamine

D. Antifertility drug

**Answer: B**



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**46.** Which of the following solid is very hard electrical insulator in solid as well as in a molten state ?

A. Ice

B. Quartz

C. Copper

D. Sodium chloride

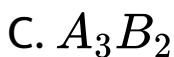
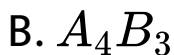
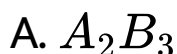
**Answer: B**



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47. Atoms of element B form hcp lattice and those of the element A occupy  $\frac{1}{3^{rd}}$  of tetrahedral voids. What is the formula of the compound formed by the elements A and B ?

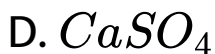
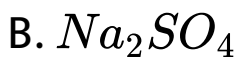


**Answer: A**



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48. Which of the following is an example of orthorhombic crystal ?



**Answer: C**



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**49.** A ferromagnetic substance becomes permanent magnet when it is placed in a magnetic field because .....

A. Domains get oriented randomly.

B. Domains are not affected by magnetic field.

C. All the domains get oriented in the direction opposite to the direction of magnetic field.

D. All the domains get oriented in the direction of magnetic field.

**Answer: D**



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50. Molality 30% w/w aqueous solution of NaOH is .....

A. 10.71 m

B. 8.32 m

C. 7.5 m

D. 9.17 m

**Answer: A**



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## Part B

1. Write two difference order of reaction and molecularity.



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2. Explain Mond process for refining Nickel with chemical equation.



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3. Draw structures of geometrical isomers of  $[Fe(NH_3)_2(CN)_4]^-$ .



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4. Write any four limitations of valence bond theory of complex compound.



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5. Write two step-equation for the following conversion. Benzene to diphenyl



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6. Write the reaction of aniline and ethenamine with nitrous acid.



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7. Write the reaction equation to show the presence of -CHO and  $\begin{matrix} \diagup \\ CO \end{matrix}$  group in Glucose.



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**8.** Explain method preparation of Nylon 6,6 by chemical equation.



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**9.** Explain method of preparation of PHBV by chemical equation.



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**10.** Explain structure of cationic detergents with example and write any one use of it.



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**11.** How does doping increase the conductivity of semiconductors ? Explain.



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**12.** Derive the formula of first order reaction for,

(i) Rate constant  $K$ ,

(ii) Half life period  $t_{\frac{1}{2}}$  (graph is not required)



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**13.** What are emulsion. Explain different types of emulsion with example.



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**14.** Write the complete balanced equation of the following :



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**15.** Give reason :

(i)  $BiH_3$  is the strongest reducing agent almost all the hydrides of group 15 elements.

(ii)  $H_2O$  is a liquid and  $H_2S$  is a gas.

(iii) Fluorine exhibits only -1 oxidation state whereas other halogens exhibit +1, +3, +5 and +7 oxidation states also.



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**16.** Describe the preparation of potassium dichromate from iron chromite ore with equation.



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**17.** Write the equation of the reaction of hydrogen iodide with :

(i) 1-Propoxypropane            (ii) methoxybenzene

(iii) benzyl ethyl ether



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**18.** Write the reactions of Williamson synthesis of 2-ethoxy-3-methyl pentane starting from ethanol and 3 methyl pentan-2-ol.



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**19.** Two elements A and B form compounds having formula  $AB_2$  and  $AB_4$ . When dissolved in 20g of benzene ( $C_6H_6$ ), 1g of  $AB_2$  lowers the freezing point by 2.3 K whereas 1g of  $AB_4$  lowers it by 1.3 K. The molar depression constant for benzene is  $5.1 \text{ K kg mol}^{-1}$ . Calculate atomic masses of A and B.



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20. Resistance of conductivity cell filled with  $0.1 \text{ mol L}^{-1}$  KCl solution is  $100 \Omega$ . If the resistance of the same cell when filled with  $0.03 \text{ mol L}^{-1}$  KCl solution is  $520 \Omega$ , calculate the conductivity and molar conductivity of  $0.03 \text{ mol L}^{-1}$  KCl solution. The conductivity of  $0.1 \text{ mol L}^{-1}$  KCl solution is  $1.29 \text{ Sm}^{-1}$ .



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21. Three electrolytic cells A, B, C containing solution  $NiSO_4$ ,  $AgNO_3$ , and  $CuSO_4$ , respectively are connected in series. A steady current of 1.5 amperes was passed through them until 1.45 g of silver deposited at the cathode of cell B. How long did the current flow? What mass of copper and Nickel were deposited? Atomic mass of Ag = 108u, Ni = 58.7u, Cu = 63.5u



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22. (i) Explain that complex  $[Ti(H_2O)_6]^{3+}$  is violet in colour, on the basis of crystal field theory.

(ii) Discuss the nature of bonding in metal carbonyls.



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23. (i) Explain Tollen's test for identification of aldehyde with chemical equation.

(ii) Write only equation of propanone of the following reactions.

(a) Wolff-kishner reductions

(b) Aldol condensation



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