



## CHEMISTRY

### BOOKS - UNITED BOOK HOUSE

### HIGHER SECONDARY EXAMINATION 2017

#### Exercise

1. The quantity of electricity required to electrolyse separately 1 M aqueous solutions of  $ZnSO_4$ ,  $AlCl_3$  and  $AgNO_3$  completely is in the ration of.

A. 2:1:1

B. 2 : 1 : 3

C. 2 : 2 : 1

D. 2 : 3 : 1

**Answer:**



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2. What is the formula of the oxide formed on burning potassium in oxygen?

A.  $K_2O$

B.  $K_2O_2$

C.  $KO_2$

D.  $K_4O_2$

**Answer:**



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3. When tetraminechloridonitritio cobalt (III) nitrate is dissolved in water, how many ions will be formed on molecule?

A. 4

B. 3

C. 2

D. 0

**Answer:**

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4. Which of the following compounds is formed when phenol is heated with  $\text{C}_6\text{I}_4$  and  $\text{NaOH}$ ?

- A. Salicylic acid
- B. Sodium salicylate
- C. Salicylaldehyde
- D. Para-hydroxybenzaldehyde

**Answer:**

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5. Which of the following is a biodegradable polymer?

A. Nylon-2-Nylon-6

B. Nylon-6,6

C. Nylon-6

D. Bakelite

**Answer:**



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6. A compound X is used as an antiseptic in 0.2% solution and as a disinfectant in 1% solution. Which of the following is X?

A. Phenol

B. Soframycin

C. Benzil

D. Iodoform

**Answer:**



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7. Which of the following exists as covalent crystals in the solid state-

A. Sodium chloride

B. Quartz

C. Sucrose

D. Iodine

**Answer:**



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8. The process by which alum purifies turbid water is

A. absorption

B. adsorption

C. coagulation

D. dispersion

**Answer:**



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**9.** Which one of the following atomic numbers is that of a lanthanoid element ?

A. 54

B. 58



C. 92

D. 74

**Answer:**

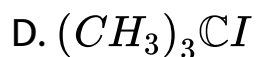
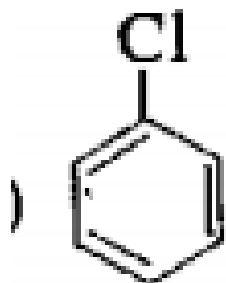


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**10.** Which of the following compounds most readily undergoes solvolysis by  $S_N1$  mechanism ?

A.  $CH_3I$

B.

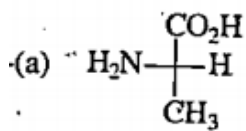


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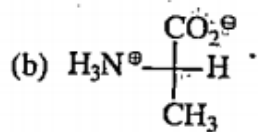
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11. In the solid state which of the following is the structure of alanine?

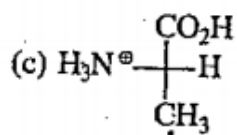
A.



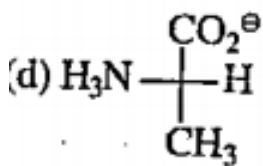
B.



C.



D.



**Answer:**



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**12. Which of the following is not a food preservative?**

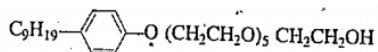
- A. common salt
- B. Sucrose
- C. Sodium benzoate
- D. Sucralose

**Answer:**



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13. Mark the hydrophobic and hydrophilic parts of the following syn-thetic detergen



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14. Atoms of which two elements among the following are of same size ? Zr, Fe, Ru, Sc, La, Hf

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15. What would be the value of paramagnetic spin moment of  $K_3[Fe(CN)_6]$ ? (Atomic No. of Fe=26)



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16. For which phenomenon colloidal particles do not settle down?



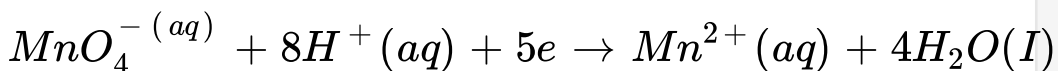
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17. If 193000 coulomb of electricity is passed through a metallic wire, how many electrons will flow through the wire?



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**18.** Write the appropriate Nernst equation for the following half-cell reaction:



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**19.** Write down the van't Hoff equation for osmotic pressure of a solution. State, with reason, whether all solutions obey this equation.

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20. When urea is added to water the freezing point decreases. Explain why.

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21. A U-tube is completely filled with  $Fe(OH)_3$  sol and a potential difference is applied by Pt electrodes immersed in each of the two arms. Towards which electrode will the sol particles move and why?

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22. Define heterogeneous catalysis with an example.





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23. How will you distinguish chemically between  $HN_3$  and  $HN_3$  ?



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24. Write down the balanced chemical equation for the reaction of  $H_2S$  with aqueous solution of  $SO_2$  and write the roles (oxidant/reductant) of the reactants in the reaction.



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25. Explain why  $Cu(NH_3)_4]^{2+}$  ion is coloured but  $[Cu(CN)_4]^{3-}$  ion is colourless.

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26. What are the two monomer units of terylene?  
Write the repeating unit of terylene.

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27. What is the ferromagnetic substance?

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**28.** KBr crystallises in face-centered cubic (fcc) crystals. The density and formula mass of KBr crystal are  $2.65\text{gcm}^{-3}$  and  $119\text{gmol}^{-1}$  respectively. Find the distance between  $K^+$  and  $Br^-$  ions in KBr crystal.

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**29.** Which kind of defect in ionic crystals does not alter the density ?

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**30.** An element X has atomic mass  $60\text{g mol}^{-1}$  and density  $6.23\text{g cm}^{-3}$ . The edge length of its unit cell is 400 pm. Identify the type of the unit cubic cell. Calculate the radius of X atom.

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**31.** 20 g of a solid solute is dissolved in 180 g of water. At  $100^\circ\text{C}$  the vapour pressure of the solution becomes 740 mmHg. Calculate relative molecular mass of the solute. (No association/dissociation of the solute takes place )

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**32.** What is the fuel cell? Write down anodic reaction and cathodic reaction of a hydrogen oxygen fuel cell. Give one use of fuel cell.

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**33.** Define specific conductivity ?

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**34.** A current of 35 ampere is passed through acidulated water for 5 minute 50 second. How many

gram of hydrogen will be liberated at the cathode ?

[1F = 96500 coulomb]

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**35.** Write self-reduction process with balanced chemical reaction in the extraction of copper from copper matte. Why is the process called 'self-reduction'?

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**36.** A green oxide of chromium(A), on fusion with KOH and  $KNO_3$  gives a yellow compound (B). The aqueous

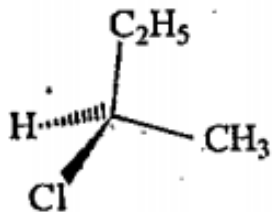
solution of (B) on acidification with dilute  $H_2SO_4$  gives an orange coloured compound (C). Identify (B) and (C) and write down balanced chemical equations involved.

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37. Comparing  $La(OH)_3$  and  $Lu(OH)_3$ , which is more basic and explain why?

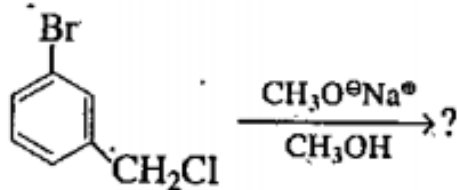
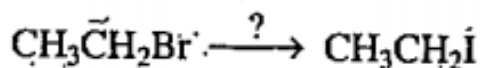
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38. Write the IUPAC name mentioning R/S notation of the following compound:



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39. Write the reagent in case of first reaction and the organic product in case of the second reaction.



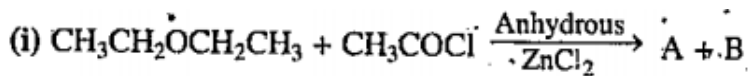
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40. Write one use of dichloromethane and one harmful effect of it on human body.

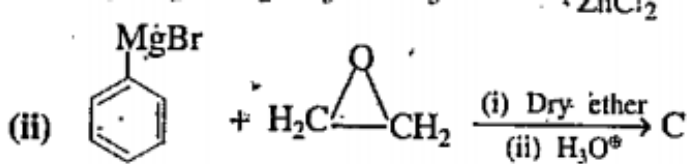
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41. Identify A, B, C, D, E and F in the following reactions:



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42. Identify A, B, C, D, E and F in the following reactions:



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43. Identify A, B, C, D, E and F in the following reactions:



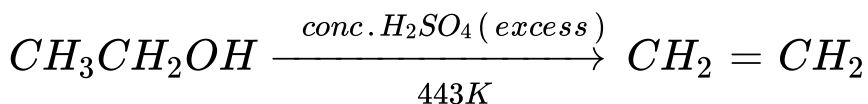
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44. Identify A, B, C, D, E and F in the following reactions:



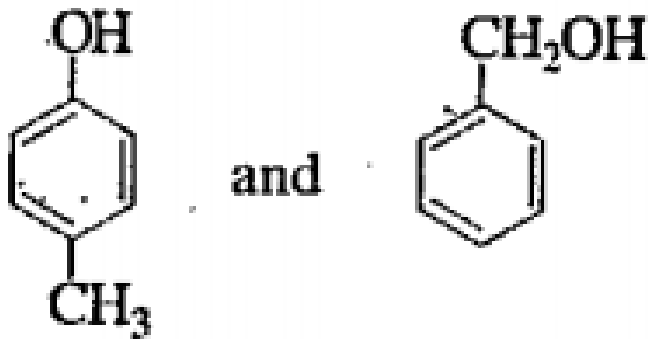
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45. Write the mechanism of the following reaction:



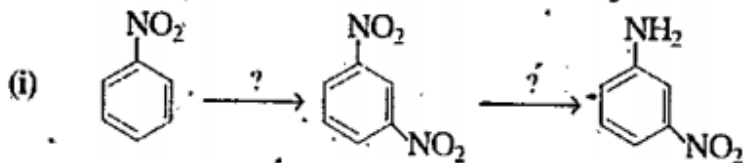
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46. How can the following two isomeric compounds be distinguished by a chemical test?



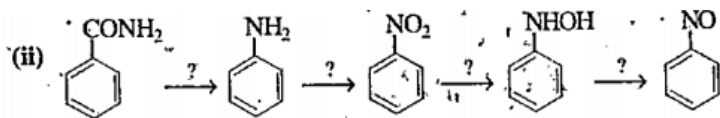
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47. Write down the reagents for the following reactions:



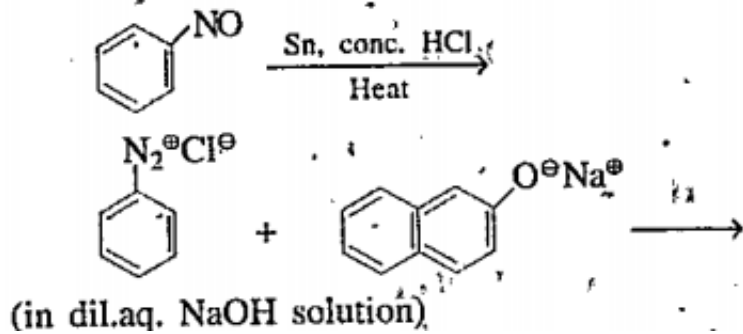
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48. Write down the reagents for the following reactions:



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49. Write the organic products of the following two reactions:



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50. What are meant by aldose and ketose? Write with examples.

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51. Write the name and biological function of a protein hormone.

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**52.** Starting from the rate law of a first-order reaction how that the half-life of the reaction is independent of the initial reactant concentration.

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**53.** The rate equation for the chemical reaction:

$aA + bB + cC \rightarrow eE + fF$  is expressed as -

$$\text{rate} = k[A]^\alpha[B]^\beta[C]^0$$

Determine overall order and molecularity of the reaction.

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**54.** In a multi-step chemical reaction, which elementary step is considered as the rate determining step?

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**55.** How does a catalyst enhance the rate of a chemical reaction? At a constant temperature, does the enthalpy of chemical reaction remain same or change in presence of a catalyst?

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56. According to collision theory of reactions, Why all molecular collisions do not result in effective collision?

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57. How does  $PCl_3$  undergo hydrolysis?

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58. Write with balanced chemical equation, what happens when chlorine gas is passed through hot concentrated KOH solution.

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59. Write the thermal stability order of hydrogen halides.

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60. An organic compound has the molecular formula  $C_2H_4O_2$ . Write the structures and names of two compounds with this formula.

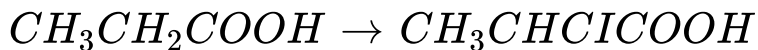
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61. How would you convert?



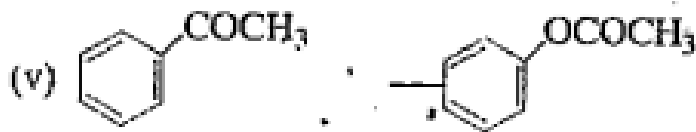
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62. How would you convert?



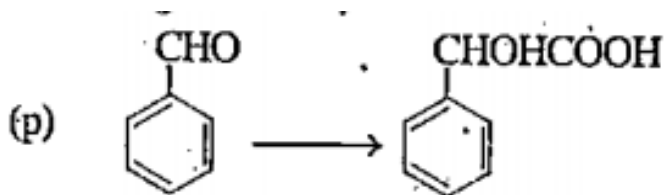
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63. How would you convert?



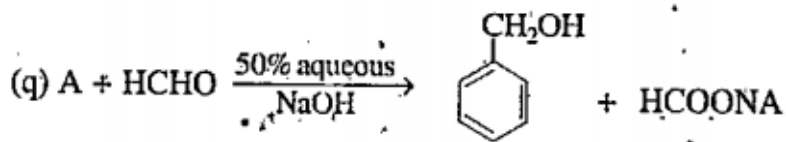
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64. How would you convert?



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65. Identify A, B, D, E, F, G in the following reactions:



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66. Name two solid elements which on combination give a liquid compound.

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67. When aniline reacts with oil of bitter almonds condensation takes place and benzal derivative is

formed. This is known as:

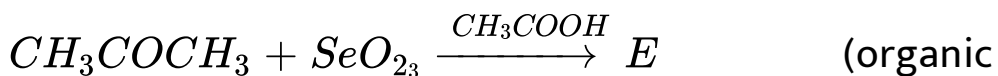
- A. (a) Schiff's base
- B. (b) Benedict's reagent
- C. (c) Million's base
- D. (d) Schiff's reagent

**Answer:**



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**68.** Identify A, B, D, E, F, G in the following reactions:



compound)

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69. Identify A, B, C, D, E and F in the following

reactions:  $CH_3COCH_3 \xrightarrow{Ba(OH)_2} C$

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70. Give the stability order of Black, Red, White Phosphorus.

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