



## CHEMISTRY

### BOOKS - FULL MARKS CHEMISTRY (TAMIL ENGLISH)

### SAMPLE PAPER - 16 ( UNSOLVED)

#### Part I

1. Consider the following statements.

(i) Ellingham drawn on a plot by considering the temperature in the x - axis and the standard free energy change for the formation of metal oxide in y - axis.

(ii) The resultant plot is straight line.

(iii) In the Ellingham diagram,  $\Delta H$  as slope and  $\Delta S$  as y - intercept.

Which of the above statement(s) is/are not correct?

A. (i) and (ii)

B. (ii) and (iii)

C. (ii) only

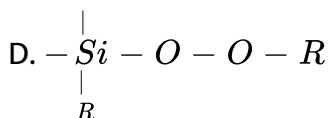
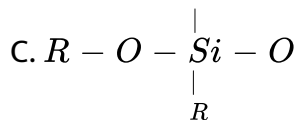
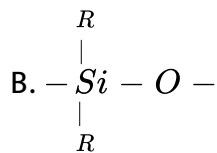
D. (iii) only

**Answer: D**

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2. The repeating unit in silicone is

A.  $SiO_2$



**Answer: B**



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3. Solid (A) reacts with strong aqueous NaOH liberating a foul smelling gas (B) which spontaneously burn in air giving smoky rings. A and B are respectively

A.  $P_4$  (red) and  $PH_3$

B.  $P_4$  (white) and  $PH_3$

C.  $S_8$  and  $H_2S$

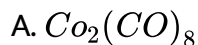
D.  $P_4$  (white) and  $H_2S$

**Answer: B**

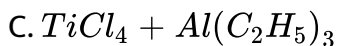


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4. Which one of the following is Zeigler - Natta catalyst?



B. Rh/Ir complex



D.  $Fe / Mo$

Answer: C



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5. Crystal field stabilization energy for high spin  $d^5$  octahedral complex is

A.  $-0.6\Delta_0$

B. 0

C.  $2(P - \Delta_0)$

D.  $2(P + \Delta_0)$

**Answer: B**



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**6.** The vacant space in bcc lattic unit cell is

A. 48 %

B. 23 %

C. 32 %

D. 26 %

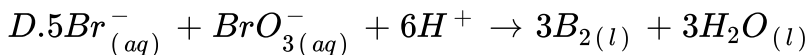
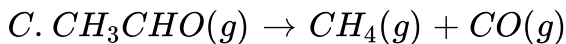
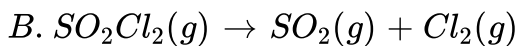
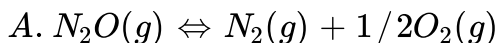
**Answer: C**



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## 7. Match the following.

List - I



List - II

1. Order = 1

2. Order = 4

3. Order = 0

4. Order = 3/2

A. 

A	B	C	D
3	1	4	2

B. 

A	B	C	D
4	2	3	1

C. 

A	B	C	D
2	4	1	3

D. 

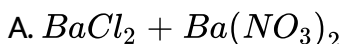
A	B	C	D
1	3	2	4

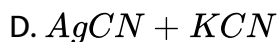
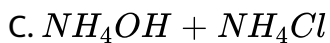
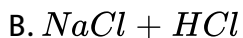
Answer: A



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## 8. Which pair will show common ion effect?





**Answer: C**

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9. When lead storage battery is charged .....

A.  $PbO_2$  is dissolved

B.  $H_2SO_4$  is regenerated

C.  $PbSO_4$  is deposited on lead electrode

D. Lead is deposited on lead electrode

**Answer: C**

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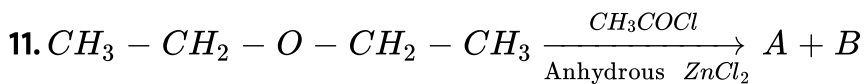
10. Which of the following is correctly matched?



- A. Emulsion-Smoke
- B. Gel- butter
- C. foam - mlst
- D. whipped cream - sol

**Answer: B**

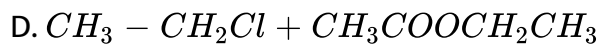
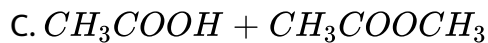
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In the above reaction A and B are

- A.  $CH_3CH_2OH + CH_3 - CH_2Cl$
- B.  $CH_3 - CH_2Cl + CH_3COOH$





**Answer: D**

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12. Which one of the following undergoes reaction with 50% sodium hydroxide solution to give the corresponding alcohol and acid

A. Phenylmethanal

B. ethanal

C. ethanol

D. methanol

**Answer: A**

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13. What is the name of the reaction in which benzene diazonium chloride react with benzene to give Biphenyl?

- A. Sandmeyer's reaction
- B. Gomberg reaction
- C. Gattermann reaction
- D. Baltz - schiemann reaction

**Answer: B**

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14. The number of  $sp^2$  and  $sp^3$  hybridised carbon in fructose are respectively

- A. 1 and 4
- B. 4 and 2

C. 5 and 1

D. 1 and 5

**Answer: D**



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**15.** A mixture of chloroxylenol and terpinecol acts as

A. antiseptic

B. antipyretic

C. antibiotic

D. analgesic

**Answer: A**



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1. What is catenation? Describe briefly the catenation property of carbon.

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2. Which catalyst is used in the hydroformylation of olefins? Give equation.

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3. The spin only magnetic moments of Tetrachloridomanganate (II) ion is 5.9 BM. On the basis of VBT, predict the type of hybridisation and geometry of the compound.

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4. Define order of a chemical reaction.

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5. Calculate the concentration of  $OH^-$  in a fruit juice which contains  $2 \times 10^{-3} M$ ,  $H_3O^+$  ion. Identify the nature of the solution.

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6. Comment on the statement : Colloid is not a substance but it is a state of substance.

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7. Suggest a reason for the large difference in the boiling point of butanol and butanal, although they have the same solubility in water.

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8. Draw the structure of sucrose.

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9. Which sweetening agents are used to prepare sweets for a diabetic patient?

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### Part iii

1. Draw the structure of  $H_4P_2O_6$  and  $H_4P_2O_7$ ?

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2. When a coordination compounds  $CrCl_3 \cdot 4H_2O$  is mixed with silver nitrate solution one mole of silver chloride is precipitated per mole of the compounds. There are no free solvent molecules in that compound. Assign the secondary valence to the metal and write the structural formula of the compounds.

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3. What are the general characteristics of solids ?

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4. Show that for a first order reaction the time required for 99.9% completion is about 10 times its half life period.

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5. In fuel cell  $H_2$  and  $O_2$  react to produce electricity. In the process,  $H_2$  gas is oxidised at the anode and  $O_2$  at cathode. If 44.8 litre of  $H_2$  at  $25^\circ C$  and also pressure reacts in 10 minutes, what is average current produced? If the entire current is used for electro deposition of Cu from  $Cu^{2+}$ , how many grams of Cu deposited?

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6. Write the possible isomers for the formula  $C_4H_{10}O$ , write their IUPAC names and structures.

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7. Draw the structure of the following compounds

i. Neopentylamine

ii. Tert - butylamine

iii.  $\alpha$  - amino propionaldehyde



iv. Tribenzylamine

v, N - ethyl - N - methylhexan - 3 - amine

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## Part Iv

1. (b) (i) Mention the uses of phosphorous ?

(ii) Why bleaching action of sulphur dioxide is temporary?

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2. (a) Describe the preparation of potassium dichromate.

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3. (b) (i) An atom crystallizes in fcc crystal lattice and has a density of  $10 \text{ g cm}^{-3}$  with unit cell edge length of 100 pm. Calculate the number of atoms present in 1 g of crystal.

(ii) What is meant by linear arrangement of spheres in one direction?

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4. (b) (i) Differentiate phenols from alcohol.

(ii) Explain about mechanism involved in the dehydration of tertiary alcohols.

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5. A Compound (A) with molecular formula  $C_2H_3N$  on acid hydrolysis gives (B) which reacts with thionylchloride to give compound (C).

Benzene reacts with compound (C) in presence of anhydrous  $AlCl_3$  to

give compound (D). Compound (D) on reduction gives (E). Identify (A), (B), (C), (D) and (E). Write the equations.



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