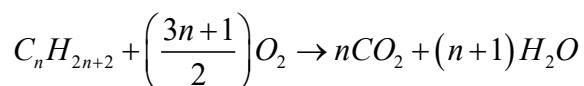
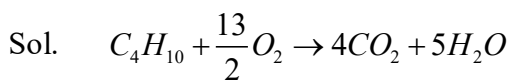


**25-07-2021-SHIFT-1 PAPER-1 CHEMISTRY MEMORY BASED**

1. In the combustion of butane 72 gm of  $H_2O$  is produced. The amount of butane taken initially is  $[X] \times 10^{-1}$ . The value of 'X' is

Ans 464



Q 1 mole  $C_4H_{10}$  produces 5 mole  $H_2O$

5 mole  $(5 \times 18) = 90 \text{ gm}$

$90 \text{ gm} \rightarrow 58 \text{ gm}$

$$72 \text{ gm} \rightarrow \left(\frac{58 \times 72}{90}\right) = 46.4 \text{ gm}$$

2.  $A + B \rightleftharpoons 2C$ .

Initially 1 mole each of A, B and C are taken in 1 litre vessel. Equilibrium constant is 100. The concentration of C at equilibrium in  $[X] \times 10^{-1}$ . The value of 'X' is

Ans 25



$$t = 0 \quad 1 \quad 1 \quad 1$$

$$t = t_{eq} \quad 1-x \quad 1-x \quad 1+2x$$

$$K_C = \frac{(1+2x)^2}{(1-x)^2}$$

$$100 = \frac{(1+2x)^2}{(1-x)^2} \text{ of } [C]$$

$$10 = \frac{(1+2x)}{(1-x)}$$

$$x = \frac{3}{4}$$

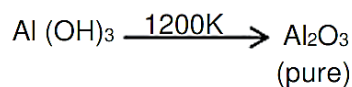
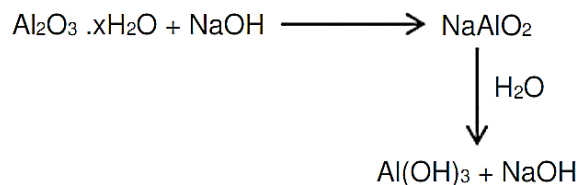
$$\text{Concentration of } [C] = 1 + 2\left(\frac{3}{4}\right) = 2.5 \times 10^{-1}$$

3. In the leaching of Bauxite, which oxide is leached out using NaOH.

- 1)  $Fe_2O_3$                       2)  $Al_2O_3$                       3)  $TiO_2$                       4)  $SiO_2$

Ans: 2

Sol:



4. Among the given oxides



The correct increasing order of oxidation state of metal is

- 1) (i) < (ii) < (iii) < (iv)                      2) (ii) < (iii) < (i) < (iv)  
3) (iii) < (iv) < (i) < (ii)                      4) (iii) < (iv) < (ii) < (i)

Ans 4

Sol.

	Compound	Oxidation state of metal
(i)	$\text{CrO}_3$	+6
(ii)	$\text{V}_2\text{O}_5$	+5
(iii)	$\text{Fe}_2\text{O}_3$	+3
(iv)	$\text{MnO}_2$	+4

5. Find the concentration of  $\text{Fe}^{2+}$  (10ml) required to reduce 15 ml of 0.1M  $\text{K}_2\text{Cr}_2\text{O}_7$  solution is:

Ans 0.9



$$15\text{ml} \quad 10\text{ml}$$

$$0.1\text{M}$$

$$N_1V_1 = N_2V_2$$

$$15 \times 0.1 \times 6 = 10 \times M \times 1$$

$$M = 0.9\text{Molar}$$

6. Arrange the following ions in the increasing order of size  $\text{Na}^+, \text{K}^+, \text{Mg}^{2+}, \text{Al}^{3+}$

- 1)  $\text{Al}^{3+} < \text{Mg}^{2+} < \text{Na}^+ < \text{K}^+$                       2)  $\text{K}^+ < \text{Na}^+ < \text{Al}^{3+} < \text{Mg}^{2+}$   
3)  $\text{Al}^{3+} < \text{Mg}^{2+} < \text{K}^+ < \text{Na}^+$                       4)  $\text{Mg}^{2+} \ll \text{Al}^{3+} < \text{K}^+ < \text{Na}^+$

Ans 1

Sol.  $K^+ > Na^+$  {moving down the group size increases}

$Na^+ > Mg^{+2} > Al^3$  {Isoelectronic species}

Z 11 12 13

E 10 10 10

7. Henry's law constant for  $CO_2$  in water in  $0.835 \times 2 \times 10^3 \text{ bar}$ . How many milimoles of  $CO_2$  would dissolve in 0.9 litre water? Assume  $CO_2$  gas exerts a partial pressure of 0.853 bar.

Ans 25

Sol  $P_{CO_2} = K_H X_{CO_2}$

$$X_{CO_2} = \frac{P_{CO_2}}{K_H} = \frac{0.835}{0.835 \times 2 \times 10^3}$$

$$X_{CO_2} = 0.5 \times 10^{-3}$$

$$\text{Number of moles of water} = \frac{900}{18} = 50$$

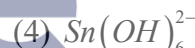
$$\frac{n_{CO_2}}{n_{CO_2} + n_{H_2O}} = 0.5 \times 10^{-3}$$

( $n_{CO_2}$  in denominator is neglected as it is  $\ll 50$ )

$$n_{CO_2} = 0.5 \times 10^{-3} \times 50 = 25 \times 10^{-3} \text{ moles}$$

$$= 25 \text{ mili moles}$$

8. Which of the following does not exist.



Ans 2

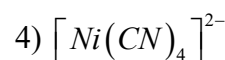
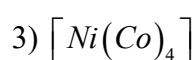
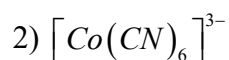
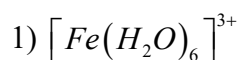
Sol. The main reasons are:

(i) Six large chloride ions cannot be accommodated around  $Si^{4+}$  due to limitation of its size.

(ii) Interaction between lone pair of chloride ion and  $Si^{4+}$  is not very strong.

The species like,  $SiF_6^{2-}$ ,  $[GeCl_6]^{2-}$ ,  $[Sn(OH)_6]^{2-}$  exist where the hybridisation of the central atom is  $sp^3d^2$ .

9. Which of the following complex is active in magnetic field.



Ans 1

Sol.  $Fe^{3+}; 3d^5$

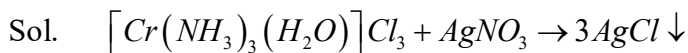
It will contain 5 unpaired electrons.

Thus it is paramagnetic and attracted in external magnetic field.

10. Empirical formula of a given octahedral complex is  $CrCl_3 \cdot 3NH_3 \cdot 3H_2O$ . It precipitates 3 moles of  $AgCl$ . What is the secondary valency of central atom.

- 1) 4                                      2) 3                                      3) 1                                      4) 6

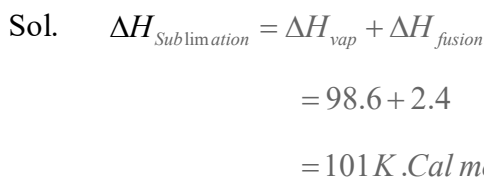
Ans 4



White ppt.

11. For a process  $\Delta H_{fusion} = 2.41 \text{ Cal mol}^{-1}$  and  $\Delta H_{vaporisation} = 98.6 \text{ k Cal mol}^{-1}$ . Then  $\Delta H_{Sublimation}$  (on  $\text{Kcal mol}^{-1}$ ):

Ans  $101 \text{ K Cal mol}^{-1}$



12. Which of the following statement is correct:

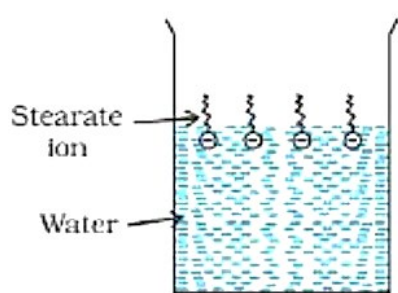
- 1)  $H-H$  bond strength is equal to  $D-D$  bond strength
- 2)  $H-H$  bond strength is half of  $D-D$  bond strength
- 3)  $H-H$  bond strength is double the  $D-D$  bond strength
- 4)  $H-H$  bond strength is less than  $D-D$  bond strength

Ans: 4

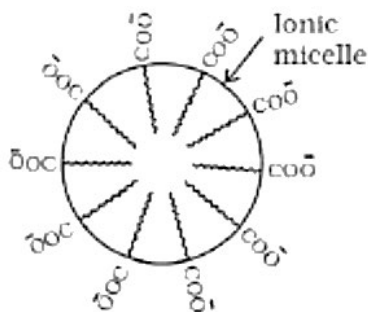
Sol: H-H bond denunciation energy 435 KJ/mol  
 D-D bond denunciation energy 450 KJ/mol

13. Which of the following about micelle formation is correct for sodium stearate  $[C_{14}H_5COONa^+]$

- 1) Micelles formed are spherical with hydrocarbon part towards the centre of sphere
- 2) Micelles formed are spherical with hydrocarbon part lying outside
- 3) Micelles formed are Non spherical with hydrocarbon part towards the centre of sphere
- 4) Micelles formed are Non-spherical with hydrocarbon part lying outside

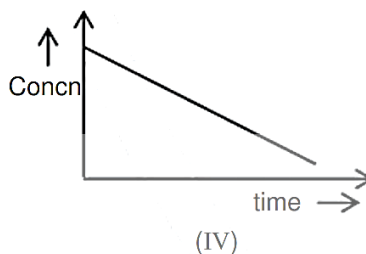
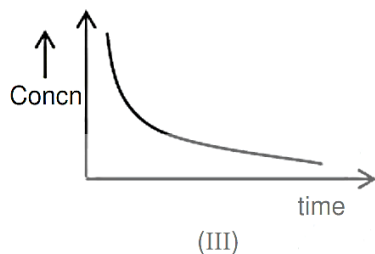
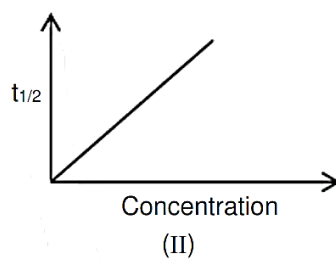
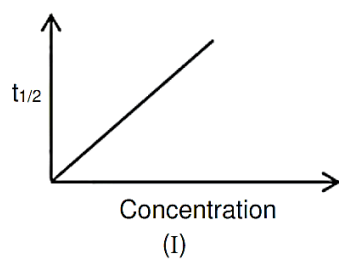


(a)



(b)

14. From the graphs given below. Select the correct statements.



- 1) I,III- First order; II,IV-Zero order
- 2) I,IV-zero order; II,III-Firs order
- 3) I,II-zero order; III,IV-First order
- 4) I,IV-First order; II,IV-zero order

Ans: 2

Sol:  $A_t = (A)_0 - Kt$ : Zero Oder

$$t_{1/2} = \left( \frac{A_0}{2K} \right)$$

$A = A_0 e^{-Kt}$ ; First oder

$$t_{1/2} = \frac{\ln 2}{K}$$



15. Which of the following protein is soluble in water?

- 1) Albumin
- 2) Fibrin
- 3) Myosin
- 4) Collage

Ans: 1

Sol: It is globular protein (water soluble)

16. Which of the following is not used for drying agent?

- 1)  $\text{Cl}_2\text{C}=\text{Cl}_2$
- 2) Liquid  $\text{CO}_2$
- 3)  $\text{H}_2\text{O}_2$
- 4)  $\text{CCl}_4$

Ans: 1

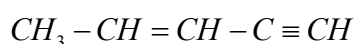
17.  $\text{CH}_3\text{MgBr}$  react which of the following to give methane gas?

- 1)  $\text{H}_2\text{S}$
- 2)  $\text{H}_2\text{O}$
- 3)  $\text{NH}_3$
- 4) All of these

Ans: 4

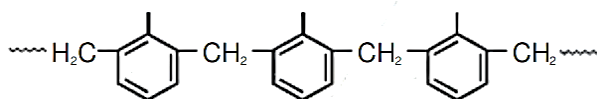
Sol: Grignard reagent act as strong base.

18. Number of  $\sigma$  bonds



Ans: 10

19. Given structure is

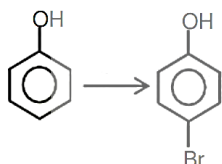


- 1) Buna-N      2) Bakelite      3) Novolac      4) Styrene

Ans: 3

Sol: Novolac is linear polymer.

20.

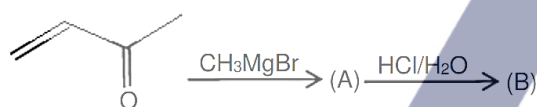


- (i)  $\text{Br}_2/\text{H}_2\text{O}$       (ii)  $\text{Br}_2/\text{FeBr}_3$       (iii)  $\text{Br}_2/\text{CS}_2$       (iv)  $\text{Br}_2/\text{CHCl}_3$

- 1) (i) & (ii)      2) (ii) & (iii)      3) (iii) & (iv)      4) (i) & (iv)

Ans: 3

21.



- 1)
- 2)
- 3)
- 4)

22. Assertion: Primary aromatic amine can't be prepared by Gabriel-phthalimide method.

Reason: Aryl halide cannot undergo nucleophilic substitution reaction.

- 1) Assertion-1 is True, Reason-2 is True; Reason-2 is a correct explanation for Assertion-1  
2) Assertion-1 is True, Reason-2 is True; Reason-2 is NOT a correct explanation for Assertion-1.  
3) Assertion-1 is True, Reason-2 is False.  
4) Assertion-1 is False, Reason-2 is True.

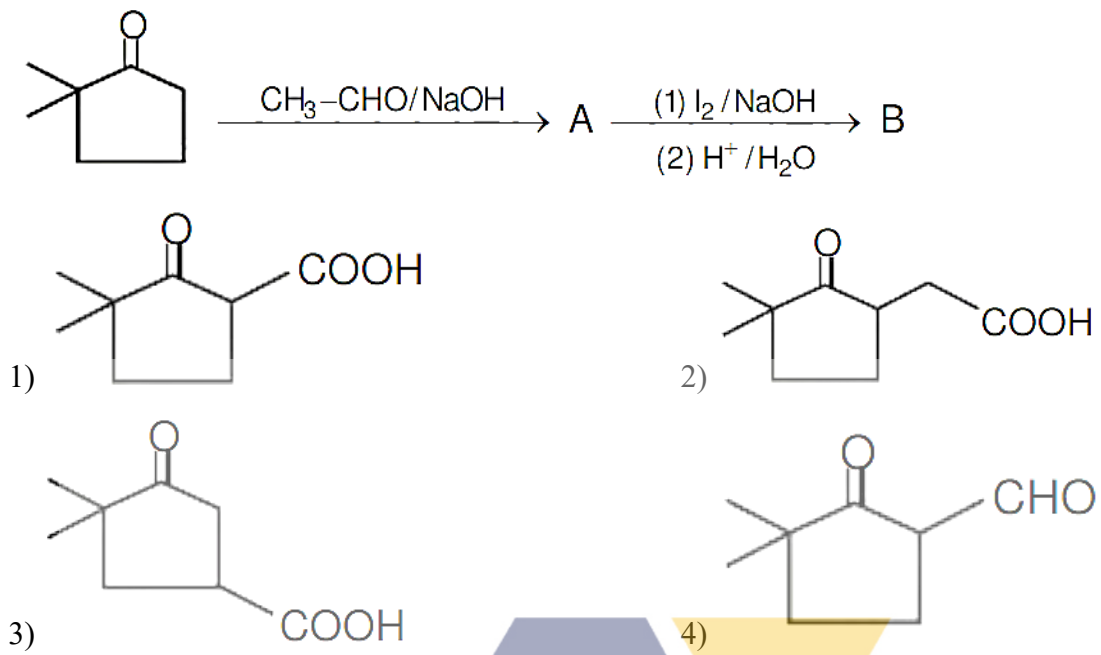
Ans: 1

23. Which of the following react with  $\text{NaHCO}_3$  and evolved  $\text{CO}_2$  gas.

- 1)
- 2)
- 3)
- 4)

Ans: 1

24.



Ans: 1

