

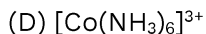
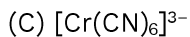
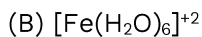
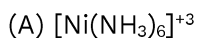


## CHEMISTRY

1. Match the column

### Column-I

Complex



### Column-II

Number of unpaired electrons

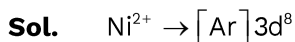
(P) 0

(Q) 2

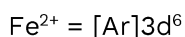
(R) 3

(S) 4

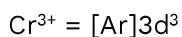
Ans. (1)



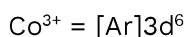
$\Rightarrow$  Unpaired electron = 2



$\Rightarrow$  Unpaired electron = 4



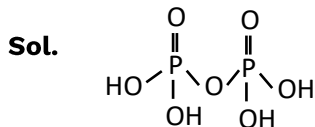
$\Rightarrow$  Unpaired electron = 3



$\Rightarrow$  Unpaired electron = 0

2. What is the ratio of sigma and pi bond in pyrophosphoric acid

Ans. 6 : 1



$\sigma = 12$

$\pi = 2 \quad \Rightarrow \quad \frac{\sigma}{\pi} = \frac{12}{2}$

= 6 : 1

3. Match the column

### Column-I

Amino acid

(A) Tryptophan

(B) Glutamine

(C) Tyrosine

(D) Glutamic Acid

### Column-II

Symbol

(P) E

(Q) Y

(R) Q

(S) W

(1) (A)–S, (B)–R, (C)–Q, (D)–P

(2) (A)–S, (B)–R, (C)– P, (D)–Q

(3) (A)–R, (B)–S, (C)– P, (D)–Q

(4) (A) – Q, (B)–R, (C)– P, (D)–S

Ans. (1)



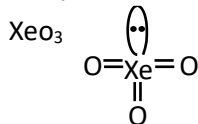
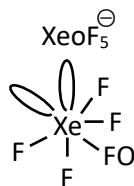
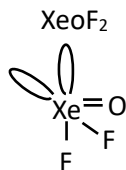
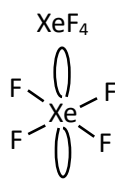


4. In how many molecules, central atom have single lone pair?

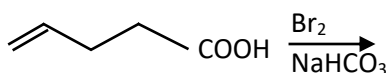
$\text{XeF}_4$ ,  $\text{XeOF}_2$ ,  $\text{XeF}_5^-$ ,  $\text{XeO}_3$

Ans. 1

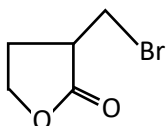
Sol.



5. Find the major product



Ans.



6. Find out oxidation number of central metal atom of  $\text{Fe}(\text{CO})_5$ ,  $\text{VO}^{2+}$ ,  $\text{WO}_3$  then calculate the sum of their oxidation.

Ans. 10

Sol.  $\text{Fe}(\text{CO})_5 \Rightarrow x + 5 \times 0 = 0 \Rightarrow x = 0$

$\text{VO}^{2+} \Rightarrow x - 2 = +2 \Rightarrow x = 4$

$\text{WO}_3 \Rightarrow x + 3(-2) \Rightarrow x = +6$

Sum =  $0 + 4 + 6 = 10$

7. Which of the following acts as a stabilizer in the decomposition of  $\text{H}_2\text{O}_2$

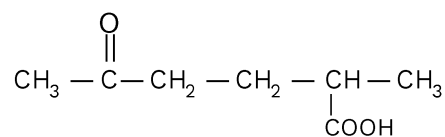
- (1) Urea (2) Alkali  
(3) Glass (4) Dust

Ans. (1)

Sol.  $\text{H}_2\text{O}_2 \xrightarrow{h\nu} \text{H}_2\text{O} + \frac{1}{2}\text{O}(\uparrow)$

Urea

8. Write the IUPAC name of given compound



(1) 2-Methyl-5-oxohexanoic acid

(2) 2-keto-5-methyl hexanoic acid

(3) 5-methyl 2-oxohexanoic acid

(4) None of these

Ans. (1)





9. If magnetic moment of  $[\text{Mn}(\text{NCS})_6]^{-x}$  is 5.92 B.M. then find x

Ans. 4

Sol.  $[\text{Mn}(\text{NCS})_6]^{-x}$   $\text{Mn} = [\text{Ar}]4s^63d^5$   
Magnetic moment = 5.92  $\text{Mn}^{2+} = [\text{Ar}]3d^5$   
 $\Rightarrow$  Unpaired electron = 5  
 $2 - 6 = -x$   
 $x = 4$

10. **Statement-1** : For redox titration we use pH indicator

**Statement-2** : For acid-base titration we use indicator which are sensitive change in oxidation state.

Ans. Both statement are wrong.

11. If ratio of wavelength in Balmer Series of  $H_\alpha$  &  $H_\beta$  is  $\frac{x}{20}$ . Find x

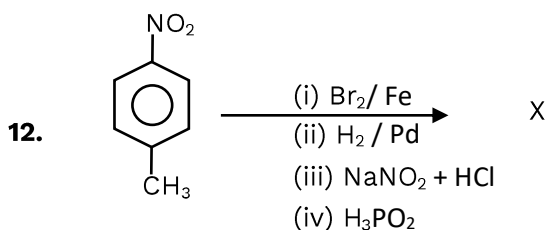
Ans. 27

Sol.  $\frac{1}{\lambda_\alpha} = k(1)^2 \left( \frac{1}{2^2} - \frac{1}{3^2} \right) = R = \left( \frac{5}{36} \right)$

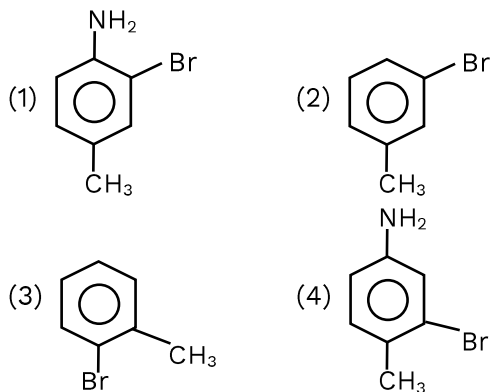
$$\frac{1}{\lambda_\beta} = k(1)^2 \left( \frac{1}{2^2} - \frac{1}{4^2} \right) = R = \left( \frac{3}{10} \right)$$

$$\frac{\lambda_\alpha}{\lambda_\beta} = \left( \frac{36 \times 3}{5 \times 10} \right) = \frac{27}{20}$$

$x = 27$



Compound X is



Ans. (3)





13. **Statement-1** : Methyl orange is weak acid

**Statement-2** : Benzenoid form of methyl orange is deeply coloured than quinoid form.

- (1) Statement-1 is correct but Statement-2 is wrong
- (2) Both the Statement-1 and Statement-2 are correct
- (3) Statement-1 is wrong but Statement-2 is correct
- (4) None of them

**Ans. (1)**

14. The temperature at which kinetic energy of oxygen molecule gets double, when initial temperature is 27° C.

**Ans. 600**

**Sol.**  $K.E. \propto T$

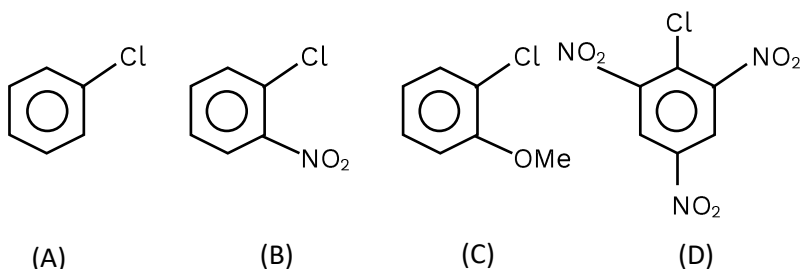
Initial Temperature = 300 K

$$\frac{K.E_1}{K.E_2} = \frac{T_1}{T_2}$$

$$\frac{K.E_1}{2K.E_1} = \frac{300}{T_2}$$

$$T_2 = 600 \text{ K}$$

15. Substitution reaction order.



- (1) (D) > (B) > (A) > (C)
- (2) (A) > (D) > (C) > (B)
- (2) (C) > (D) > (A) > (B)
- (4) (B) > (A) > (C) > (D)

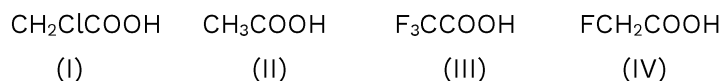
**Ans. (1)**

16. In Hall Heroult process reduces  $Al_2O_3$  using :

- (1)  $Na_3AlF_6$
- (2)  $CaF_2$
- (3) Mn
- (4) Both (1) and (2)

**Ans. (4)**

17. What is the order of acidic strength :



**Ans. (III) > (IV) > (I) > (II)**

18. How many of the following have 5 radial nodes?

5s, 6s, 7s, 6p and 4p

**Ans. 1**





**Sol.**  $n - \ell - 1$   
 $= 6 - 0 - 1 = 5$   
Hence 6s is correct answer

**19.** In good quality cement ratio of lime to total oxides of silicon ( $\text{SiO}_2$ ), Aluminium ( $\text{Al}_2\text{O}_3$ ) and iron ( $\text{Fe}_2\text{O}_3$ ) should be as close to:

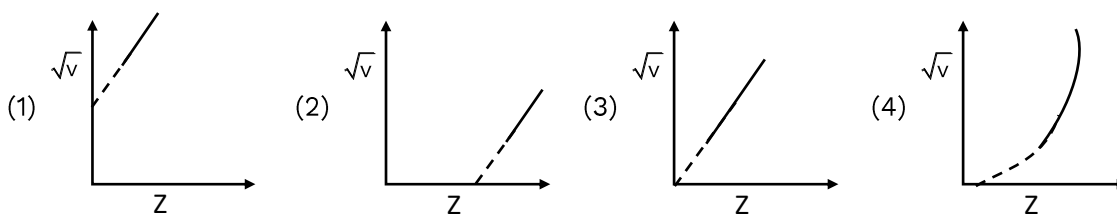
**Ans. 2**

**20.**  $K_{sp}$  of  $\text{BaSO}_4$  is  $8 \times 10^{-11}$ . If the solubility in presence of 0.1 M  $\text{CaSO}_4$  is  $X \times 10^{-10}$  M, then X is :

**Ans. 8**

**Sol.**  $\text{BaSO}_4 \rightleftharpoons \text{Ba}^x + \text{SO}_4^{2-}$   
 $x \quad 0.1$   
 $x \times 0.1 = 8 \times 10^{-11}$   
 $x = 8 \times 10^{-10}$

**21.** Graph between  $\sqrt{v}$  and atomic number (z).



**Ans. (2)**

**Sol.**  $y = mx + c$   
 $\sqrt{v} = a(z - b)$

**22.** Which of the following has maximum Vander waal forces of attraction?

- (1) Ar                      (2)  $\text{CH}_4$                       (3) Hexane                      (4) Water

**Ans. (3)**

**23.** The boiling points of two solvents X and Y are in the ratio of 2 : 1 and their enthalpy of vaporisation is in the ratio 1 : 2. Find the ratio of elevation in boiling point when same moles of solute are added to same mass of both the solvents, if the molar mass of X is twice that of Y.

**Ans. 16:1**

**24.** Correct order of acidic strength of

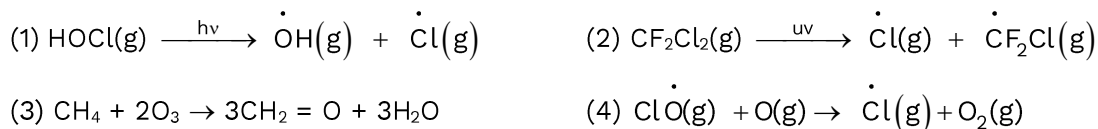
- (A) o-fluoro benzoic acid                      (B) o-chloro benzoic acid  
(C) o-bromo benzoic acid                      (D) o-iodo benzoic acid  
(1)  $C > D > B > A$                       (2)  $D > B > A > C$                       (3)  $C > D > A > B$                       (4)  $D > B > D > A$

**Ans. (1)**





25. The reaction that is not involved in the ozone layer depletion mechanism in the stratosphere is :



Ans. (3)

26. A Carnot engine working between 27°C and 127°C performs 2 kJ of work. The amount of heat rejected is equal to :

- (1) 4                                      (2) 6                                      (3) 8                                      (4) 12

Ans. (2)

Sol.  $\eta = 1 - \frac{300}{400} = \frac{|w'|}{q_{\text{abs}}}$

$$\frac{100}{400} = \frac{2000}{q_{\text{abs}}}$$

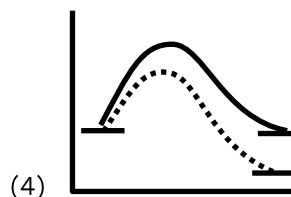
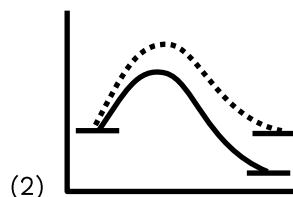
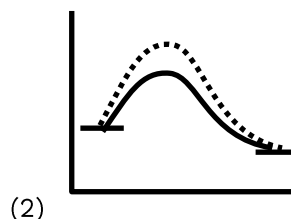
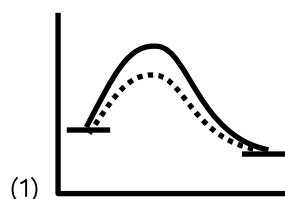
$$q_{\text{abs}} = 8 \text{ kJ}$$

$$\text{heat rejected} = 8 - 2 = 6 \text{ kJ}$$

27. Find out the correct option by using +ve catalyst

\_\_\_\_\_ without catalyst

----- with catalyst



Ans. (1)

28. Which of the following is correct ?

- (a) Photocurrent  $\propto$  intensity of photo electrons  
(b) Kinetic energy is dependent on frequency  
(c) Kinetic energy is independent on frequency  
(1) (a) and (b) only      (2) (b) only      (3) (c) and (a) only      (4) (c) only

Ans. (1)





**29.** For  $\text{As}_2\text{S}_3$  colloidal solution, the coagulation value of  $\text{AlCl}_3$  &  $\text{NaCl}$  are 0.09 and 50.04 respectively. If the coagulation power of  $\text{AlCl}_3$  is  $x$  times of  $\text{NaCl}$ , then tell the value of  $x$ .

**Ans. 556**

**Sol.** C.P. of  $\text{AlCl}_3 = x \times$  C.P. of  $\text{NaCl}$

$$\Rightarrow \frac{\text{coagulation value of } \text{AlCl}_3}{\text{coagulation value of } \text{NaCl}} = x$$

$$x = \frac{50.04}{0.09}$$

$$x = 556$$

**30.** Metal high speed electron is bombarded which rays are emitted

(1) Radio                      (2) Micro                      (3) Gamma                      (4) X-ray

**Ans. (4)**

