

**CHEMISTRY**

27th Jan Shift - 1

1. Which of the following has maximum magnetic moment?

- (1)  $3d^3$                       (2)  $3d^6$                       (3)  $3d^7$

**Ans. (2)**

2. Mass of methane required to produce 22 g  $CO_2$  upon combustion is \_\_\_\_\_.

**Ans. (8)**

**Sol.** Moles of  $CO_2 = \frac{22}{44} = 0.5 \therefore n_{CH_4} = 0.5 \therefore m_{CH_4} = 8g$

3. Assertion : Boron has very high melting point (2453 K)

Reason : Boron has strong crystalline lattice.

**Ans.** A-T ; R-T ;

Exp.  $\rightarrow$  Right

4. Sum of bond order of  $CO$  &  $NO^+$  is :

**Ans. (6)**

**Sol.**  $CO : 3 ; NO^+ : 3$

5. How many of following have +4 oxidation number of central atom:

$BaSO_4, SOCl_2, SF_4, H_2SO_3, H_2S_2O_7, SO_3$

**Ans. (3)**

**Sol.**  $SOCl_2, SF_4, H_2SO_3$

6.  $PbCrO_4 + NaOH$  (hot excess)  $\longrightarrow$  ?

Product is :

(1) dianionic ; CN = 4

(2) tetra-anionic ; CN = 6

(3) dianionic ; CN = 6

(4) tetra-anionic ; CN = 4

**Ans. (4)**



7. For negative deviation from Raoult's law :

- (1) BP increases ; VP increases                      (2) BP decreases ; VP increases  
 (3) BP decreases ; VP decreases                    (4) BP increases ; VP decreases

Ans. (4)

8.  $\text{NaCl} + \text{H}_2\text{SO}_4 + \text{K}_2\text{Cr}_2\text{O}_7 \longrightarrow \text{Products}$

Above reaction gives red fumes (A) which on hydrolysis with aqueous NaOH gives yellow solution (B). Compounds (A) and (B) are :

Ans.  $\text{CrO}_2\text{Cl}_2, \text{Na}_2\text{CrO}_4$

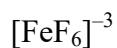
Sol.  $\text{NaCl} + \text{H}_2\text{SO}_4 + \text{K}_2\text{Cr}_2\text{O}_7 \rightarrow \text{CrO}_2\text{Cl}_2 + \text{Na}_2\text{SO}_4 + \text{K}_2\text{SO}_4 + \text{H}_2\text{O}$

(A)

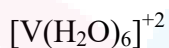
$\text{CrO}_2\text{Cl}_2 + \text{NaOH (aq.)} \rightarrow \text{Na}_2\text{CrO}_4 + \text{NaCl} + \text{H}_2\text{O}$

(B)

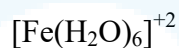
9. Order of spin only magnetic moment for



(P)



(Q)



(R)

(1)  $P > R > Q$

(2)  $P > Q > R$

(3)  $R > Q > P$

(4)  $Q > P > R$

Ans. (1)

Sol. P :  $[\text{FeF}_6]^{-3} \Rightarrow 3d^5 \text{ (WFL)} \Rightarrow n = 5 ; \mu = \sqrt{35}$

Q :  $[\text{V}(\text{H}_2\text{O})_6]^{+2} \Rightarrow 3d^3 \Rightarrow n = 3 ; \mu = \sqrt{15}$

R :  $[\text{Fe}(\text{H}_2\text{O})_6]^{+2} \Rightarrow 3d^6 \text{ (WFL)} \Rightarrow n = 4 ; \mu = \sqrt{24}$

10. Electronic configuration of Nd(Z = 60) is :

Ans.  $[\text{Xe}] 4f^4 6s^2$

11. **Statement-1:**  $(\text{NH}_4)_2\text{CO}_3$  is basic.

**Statement-2:** Acidic nature of salt of WA & WB is dependent on  $K_a$  of WA &  $K_b$  of WB.

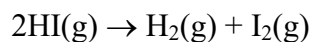
Ans. ( $S_1 \rightarrow T ; S_2 \rightarrow T$ )



12. Number of electrons present in all the compound filled subshell having  $n = 4$  and  $s = +1/2$ .

Ans. (16)

13. Consider following data :



	Experiment-1	Experiment-2	Experiment-3
HI(mole/litre)	0.005	0.01	0.02
Rate ( $\text{mol L}^{-1} \text{s}^{-1}$ )	$7.5 \times 10^{-4}$	$3 \times 10^{-3}$	$1.2 \times 10^{-2}$

Find order of reaction.

Ans. (2)

Sol. Rate =  $K[\text{HI}]^x$   $x = \text{order}$

$$\frac{(\text{Rate})_2}{(\text{Rate})_1} = \left( \frac{[\text{HI}]_1}{[\text{HI}]_2} \right)^x$$

$$\frac{3 \times 10^{-3}}{7.5 \times 10^{-4}} = \left( \frac{0.01}{0.005} \right)^x$$

$$4 = 2^x$$

$$\therefore x = 2$$

14. If 3 moles of an ideal gas at 300 K expands isothermally from  $30 \text{ dm}^3$  to  $45 \text{ dm}^3$  against constant pressure of 80 K pascal then the amount of heat transfer is \_\_\_ joule.

Ans. (1200)

Sol. Process  $\Rightarrow$  Isothermal, irreversible  $\Rightarrow \Delta E = 0$

$$P_{\text{ext}} = \text{Constant} = 80 \text{ kPa}$$

$$\text{Expansion } V_1 = 30 \text{ dm}^3 \quad V_2 = 45 \text{ dm}^3$$

$$\Delta E = 0 = q + W$$

$$q = -W$$

$$q = -[-P(V_2 - V_1)]$$

$$q = 80 \text{ kPa} [45 \text{ dm}^3 - 30 \text{ dm}^3]$$

$$= 80 \times 10^3 \text{ Pa} \times 15 \times 10^{-3} \text{ m}^3$$

$$= 1200 \text{ J}$$

15. The mass of silver ( $\text{Ag} = 108 \text{ gm/mole}$ ) displaced by a quantity of electricity which displaces 5600 ml of  $\text{O}_2$  at STP will be :

Ans. (108)

Sol. mole  $\times$  valency factor = mole  $\times$  valency factor

$$\frac{W}{108} \times 1 = \frac{5600}{22400} \times 4$$

$$W = 108 \text{ g}$$

16. Which of the following has +4 oxidation state ?

(1)  $\text{H}_2\text{S}_2\text{O}_7$                       (2)  $\text{H}_2\text{SO}_3$

Ans. (2)

Sol.  $\text{H}_2\text{S}_2\text{O}_3$

$$+2 + x - 6 = 0$$

$$x = +4$$

17. Which halogen does not show variable oxidation state ?

(1)  $\text{F}_2$                       (2)  $\text{Cl}_2$                       (3)  $\text{Br}_2$                       (4)  $\text{I}_2$

Ans. (1)

Sol. F : Only (-1) in compounds

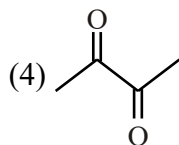
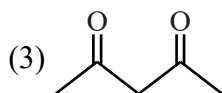
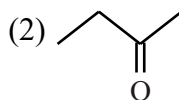
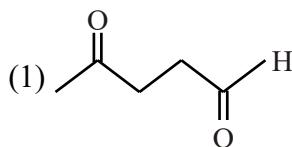
( $\therefore$  is not EN)

18. **Statement-1:** 4f & 5f series are written separately in periodic table in order to preserve principle of classification.

**Statement-2:** s-Block elements can be found on earth in pure form.

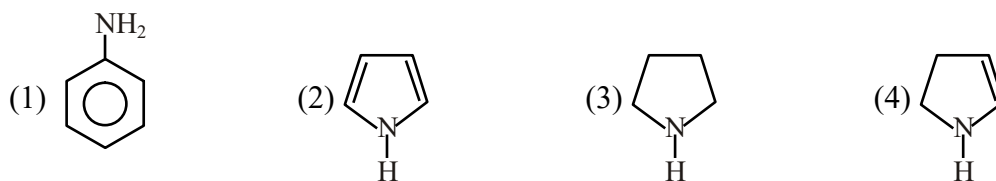
Ans. First statement is correct and second is not correct.

19. Which of the following compound is most acidic?



Ans. (3)

20. Which of the following is the strongest Bronsted base?



Ans. (3)

21. The correct statement regarding stereochemistry of  $S_N1$  and  $S_N2$  reaction is

- (1)  $S_N1$  – Racemisation  
 $S_N2$  – Retention  
 (2)  $S_N1$  – Racemisation  
 $S_N2$  – Inversion  
 (3)  $S_N1$  – Retention  
 $S_N2$  – Inversion  
 (4)  $S_N1$  – Inversion  
 $S_N2$  – Retention

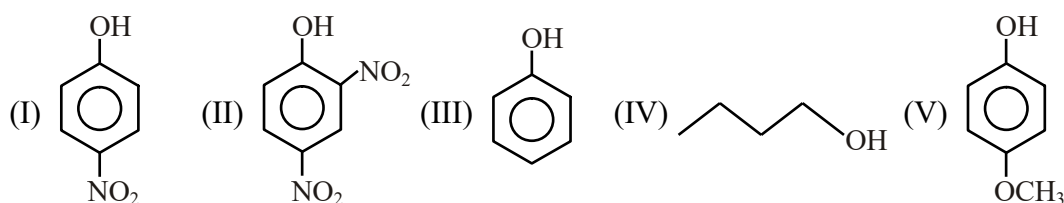
Ans. (2)

22. Which of the following has maximum enol content?



Ans. (1)

23. The correct order of acidic strength of the following compounds is

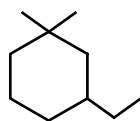


- (1) II > I > III > V > IV  
 (2) II > I > V > III > IV  
 (3) I > II > III > V > IV  
 (4) V > IV > III > I > II

Ans. (1)



24. The correct IUPAC name of following compound is



- (1) 1,1-Dimethyl-3-ethyl cyclohexane
- (2) 3-Ethyl-1,1-dimethyl cyclohexane
- (3) 1-Ethyl-3,3-dimethyl cyclohexane
- (4) 3,3-Dimethyl-1-ethyl cyclohexane

Ans. (2)

25. Cyclohexene is classified in

- (1) Benzenoid aromatic
- (2) Alicyclic
- (3) Benzenoid non aromatic
- (4) Acyclic

Ans. (2)

26. Which of the following is polar solvent

- (1)  $\text{CCl}_4$
- (2)  $\text{CHCl}_3$
- (3)  $\text{CH}_2=\text{CH}_2$
- (4)  $\text{CO}_2$

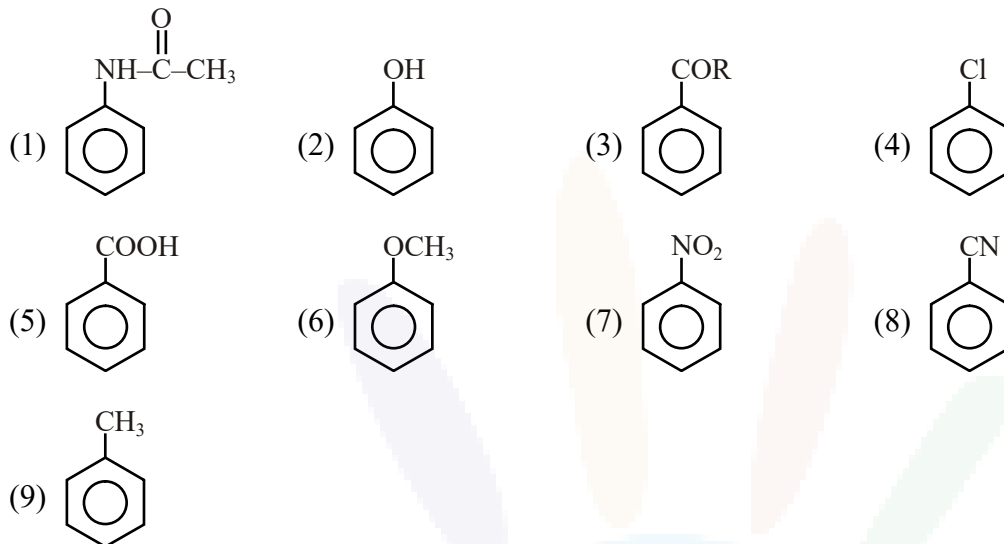
Ans. (2)

27. When nucleotide forms dimer the linkage present between is

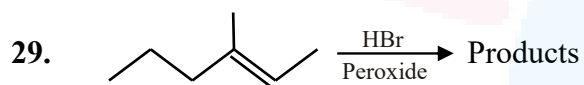
- (1) Disulphide linkage
- (2) Glycosidic linkage
- (3) Phosphodiester linkage
- (4) Peptide linkage

Ans. (3)

28. How many groups show meta directing effect on benzene ring?



Ans. (4)



How many products including stereoisomers are obtained in above reaction?

Ans. 4

