

**TEST PAPER OF JEE(MAIN) EXAMINATION – 2019**  
**(Held On Saturday 12<sup>th</sup> JANUARY, 2019) TIME : 2 : 30 PM To 05 : 30 PM**  
**CHEMISTRY**

1. 8g of NaOH is dissolved in 18g of H<sub>2</sub>O. Mole fraction of NaOH in solution and molality (in mol kg<sup>-1</sup>) of the solutions respectively are :  
(1) 0.167, 11.11  
(2) 0.2, 22.20  
(3) 0.2, 11.11  
(4) 0.167, 22.20

Ans. (1)

2. The correct statement(s) among I to III with respect to potassium ions that are abundant within the cell fluids is/are :

- I. They activate many enzymes  
II. They participate in the oxidation of glucose to produce ATP  
III. Along with sodium ions, they are responsible for the transmission of nerve signals

- (1) I, II and III                      (2) I and III only  
(3) III only                              (4) I and II only

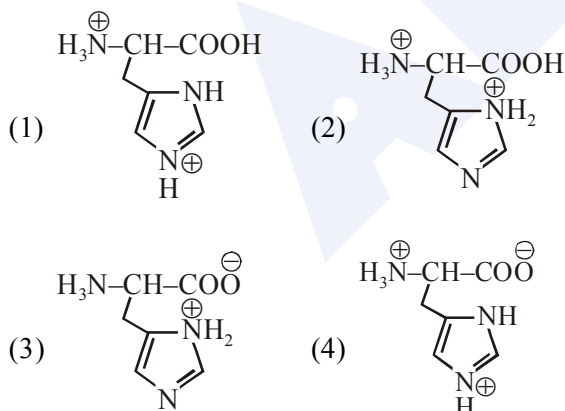
Ans. (1)

3. The magnetic moment of an octahedral homoleptic Mn(II) complex is 5.9 BM. The suitable ligand for this complex is :

- (1) CN<sup>-</sup>                                      (2) NCS<sup>-</sup>  
(3) CO                                        (4) ethylenediamine

Ans. (2)

4. The correct structure of histidine in a strongly acidic solution (pH=2) is



Ans. (1)

5. The compound that is NOT a common component of photochemical smog is :

- (1) O<sub>3</sub>                                        (2) CH<sub>2</sub>=CHCHO  
(3) CF<sub>2</sub>Cl<sub>2</sub>                                (4) H<sub>3</sub>C-C(=O)-OONO<sub>2</sub>

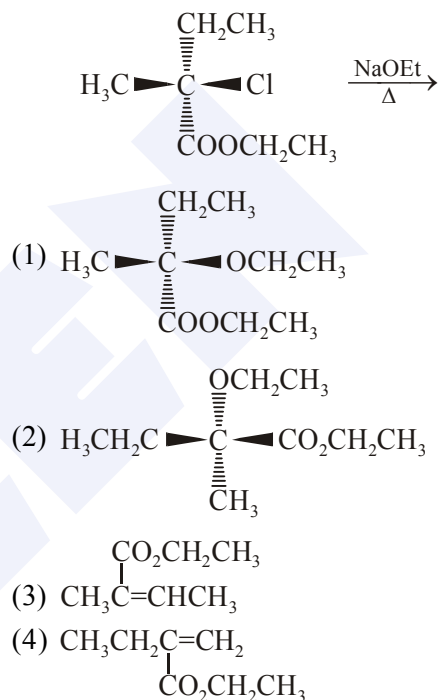
Ans. (3)

6. The upper stratosphere consisting of the ozone layer protects us from the sun's radiation that falls in the wavelength region of :

- (1) 600-750 nm  
(2) 0.8-1.5 nm  
(3) 400-550 nm  
(4) 200-315 nm

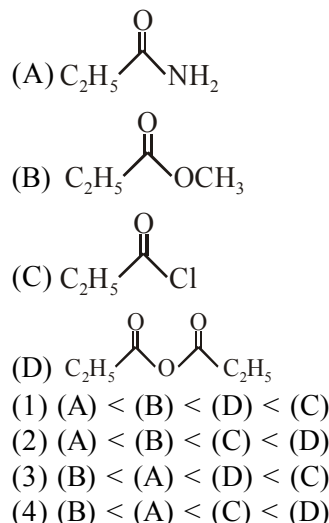
Ans. (4)

7. The major product of the following reaction is:



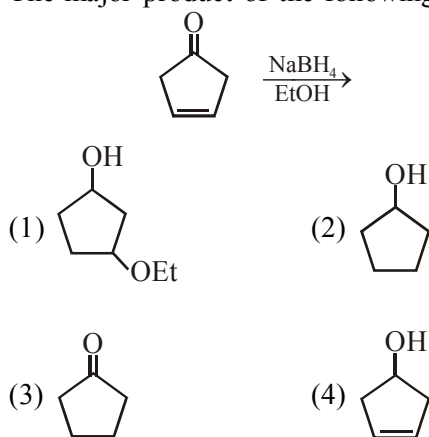
Ans. (3)

8. The increasing order of the reactivity of the following with LiAlH<sub>4</sub> is :



Ans. (1)

9. The major product of the following reaction is:



Ans. (4)

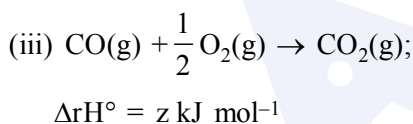
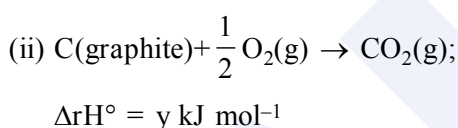
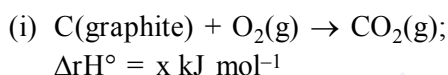
10. Molecules of benzoic acid ( $C_6H_5COOH$ ) dimerise in benzene. 'w' g of the acid dissolved in 30 g of benzene shows a depression in freezing point equal to 2K. If the percentage association of the acid to form dimer in the solution is 80, then w is :

(Given that  $K_f = 5 \text{ K kg mol}^{-1}$ , Molar mass of benzoic acid =  $122 \text{ g mol}^{-1}$ )

(1) 1.8 g (2) 2.4 g (3) 1.0 g (4) 1.5 g

Ans. (2)

11. Given :



Based on the above thermochemical equations, find out which one of the following algebraic relationships is correct ?

(1)  $z = x + y$  (2)  $x = y - z$   
 (3)  $x = y + z$  (4)  $y = 2z - x$

Ans. (3)

12. An open vessel at  $27^\circ\text{C}$  is heated until two fifth of the air (assumed as an ideal gas) in it has escaped from the vessel. Assuming that the volume of the vessel remains constant, the temperature at which the vessel has been heated is :

(1)  $750^\circ\text{C}$  (2)  $500^\circ\text{C}$   
 (3) 750 K (4) 500 K

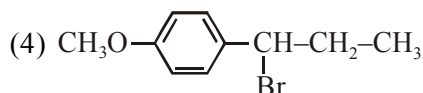
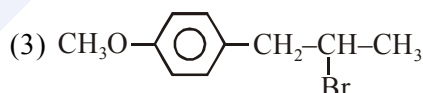
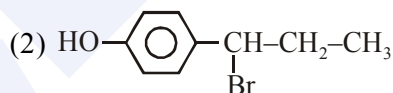
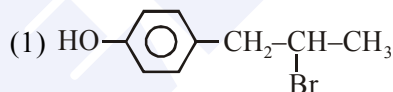
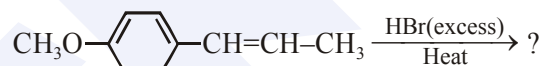
Ans. (4)

13.  $\Lambda_m^\circ$  for NaCl, HCl and NaA are 126.4, 425.9 and  $100.5 \text{ S cm}^2\text{mol}^{-1}$ , respectively. If the conductivity of 0.001 M HA is  $5 \times 10^{-5} \text{ S cm}^{-1}$ , degree of dissociation of HA is :

(1) 0.75 (2) 0.125  
 (3) 0.25 (4) 0.50

Ans. (2)

14. The major product in the following conversion is :



Ans. (2)

15. If  $K_{sp}$  of  $Ag_2CO_3$  is  $8 \times 10^{-12}$ , the molar solubility of  $Ag_2CO_3$  in 0.1M  $AgNO_3$  is :

(1)  $8 \times 10^{-12} \text{ M}$   
 (2)  $8 \times 10^{-10} \text{ M}$   
 (3)  $8 \times 10^{-11} \text{ M}$   
 (4)  $8 \times 10^{-13} \text{ M}$

Ans. (2)

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0744-2750275

16. Among the following, the false statement is :

- (1) Latex is a colloidal solution of rubber particles which are positively charged
- (2) Tyndall effect can be used to distinguish between a colloidal solution and a true solution.
- (3) It is possible to cause artificial rain by throwing electrified sand carrying charge opposite to the one on clouds from an aeroplane.
- (4) Lyophilic sol can be coagulated by adding an electrolyte.

Ans. (1)

17. The pair that does NOT require calcination is:

- (1) ZnO and MgO
- (2) Fe<sub>2</sub>O<sub>3</sub> and CaCO<sub>3</sub>.MgCO<sub>3</sub>
- (3) ZnO and Fe<sub>2</sub>O<sub>3</sub>.xH<sub>2</sub>O
- (4) ZnCO<sub>3</sub> and CaO

Ans. (1)

18. The correct order of atomic radii is :

- (1) Ce > Eu > Ho > N
- (2) N > Ce > Eu > Ho
- (3) Eu > Ce > Ho > N
- (4) Ho > N > Eu > Ce

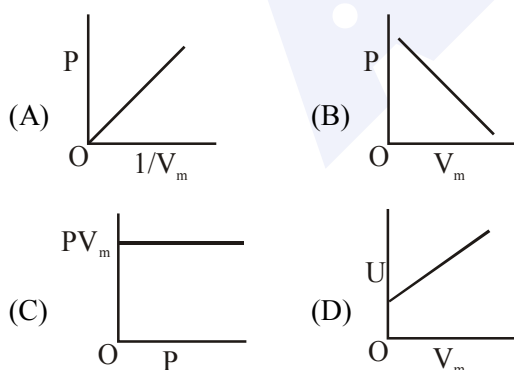
Ans. (3)

19. The element that does NOT show catenation is:

- (1) Sn
- (2) Ge
- (3) Si
- (4) Pb

Ans. (4)

20. The combination of plots which does not represent isothermal expansion of an ideal gas is:



- (1) (A) and (C)
- (2) (A) and (D)
- (3) (B) and (D)
- (4) (B) and (C)

Ans. (3)

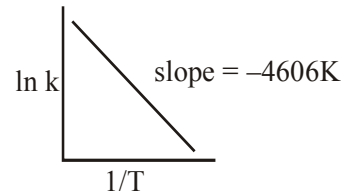
21. The volume strength of 1M H<sub>2</sub>O<sub>2</sub> is:

(Molar mass of H<sub>2</sub>O<sub>2</sub> = 34 g mol<sup>-1</sup>)

- (1) 16.8
- (2) 11.35
- (3) 22.4
- (4) 5.6

Ans. (2)

22. For a reaction, consider the plot of ln k versus 1/T given in the figure. If the rate constant of this reaction at 400 K is 10<sup>-5</sup> s<sup>-1</sup>, then the rate constant at 500 K is :



- (1) 2 × 10<sup>-4</sup> s<sup>-1</sup>
- (2) 10<sup>-4</sup> s<sup>-1</sup>
- (3) 10<sup>-6</sup> s<sup>-1</sup>
- (4) 4 × 10<sup>-4</sup> s<sup>-1</sup>

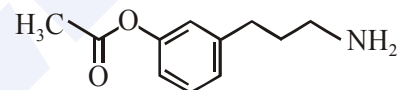
Ans. (2)

23. The element that shows greater ability to form pπ-pπ multiple bonds, is :

- (1) Si
- (2) Ge
- (3) Sn
- (4) C

Ans. (4)

24. The major product of the following reaction is:

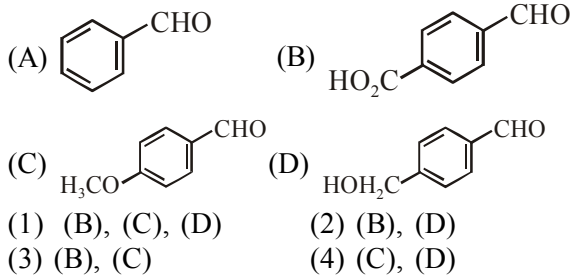


- (i) NaNO<sub>2</sub>/H<sup>+</sup>
- (ii) CrCO<sub>3</sub>/H<sup>+</sup>
- (iii) H<sub>2</sub>SO<sub>4</sub> (conc.), Δ

- (1) Oc1ccc2c(c1)C(=O)CC2
- (2) CC(=O)Oc1ccc2c(c1)C(=O)CC2
- (3) CC(=O)Oc1ccc2c(c1)C(=O)CC2
- (4) Oc1ccc2c(c1)C(=O)CC2

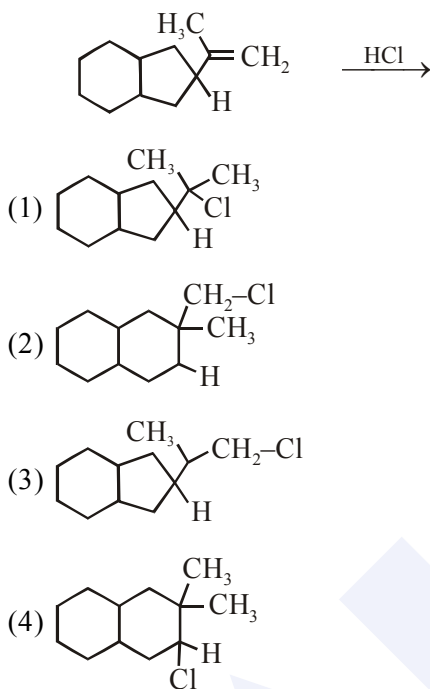
Ans. (4)

25. The aldehydes which will not form Grignard product with one equivalent Grignard reagents are :



Ans. (2)

26. The major product of the following reaction is:



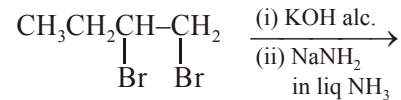
Ans. (1)

27. Chlorine on reaction with hot and concentrated sodium hydroxide gives :

- (1)  $\text{Cl}^-$  and  $\text{ClO}_2^-$   
 (2)  $\text{Cl}^-$  and  $\text{ClO}_3^-$   
 (3)  $\text{Cl}^-$  and  $\text{ClO}^-$   
 (4)  $\text{ClO}_3^-$  and  $\text{ClO}_2^-$

Ans. (2)

28. The major product of the following reaction is:



- (1)  $\text{CH}_3\text{CH}_2\text{C}\equiv\text{CH}$   
 (2)  $\text{CH}_3\text{CH}_2\underset{\text{NH}_2}{\text{CH}}-\underset{\text{NH}_2}{\text{CH}_2}$   
 (3)  $\text{CH}_3\text{CH}=\text{C}=\text{CH}_2$   
 (4)  $\text{CH}_3\text{CH}=\text{CHCH}_2\text{NH}_2$

Ans. (1)

29. If the de Broglie wavelength of the electron in  $n^{\text{th}}$  Bohr orbit in a hydrogenic atom is equal to  $1.5 \pi a_0$  ( $a_0$  is Bohr radius), then the value of  $n/z$  is :

- (1) 1.0      (2) 0.75      (3) 0.40      (4) 1.50

Ans. (2)

30. The two monomers for the synthesis of Nylon 6, 6 are :

- (1)  $\text{HOOC}(\text{CH}_2)_6\text{COOH}$ ,  $\text{H}_2\text{N}(\text{CH}_2)_6\text{NH}_2$   
 (2)  $\text{HOOC}(\text{CH}_2)_4\text{COOH}$ ,  $\text{H}_2\text{N}(\text{CH}_2)_4\text{NH}_2$   
 (3)  $\text{HOOC}(\text{CH}_2)_6\text{COOH}$ ,  $\text{H}_2\text{N}(\text{CH}_2)_4\text{NH}_2$   
 (4)  $\text{HOOC}(\text{CH}_2)_4\text{COOH}$ ,  $\text{H}_2\text{N}(\text{CH}_2)_6\text{NH}_2$

Ans. (4)

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Test Dates: 24<sup>th</sup> & 31<sup>st</sup> March

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