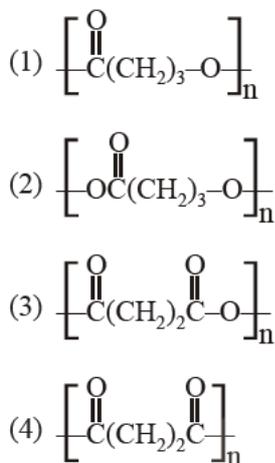


TEST PAPER OF JEE(MAIN) EXAMINATION – 2019
(Held On Friday 11th JANUARY, 2019) TIME : 02 : 30 PM To 05 : 30 PM
CHEMISTRY

1. The correct option with respect to the Pauling electronegativity values of the elements is :-
 (1) Ga < Ge (2) Si < Al
 (3) P > S (4) Te > Se

Ans. (1)

2. The homopolymer formed from 4-hydroxybutanoic acid is :-



Ans. (1)

3. The correct match between Item I and Item II is :-

Item I		Item II	
(A)	Ester test	(P)	Tyr
(B)	Carbylamine test	(Q)	Asp
(C)	Phthalein dye test	(R)	Ser
		(S)	Lys

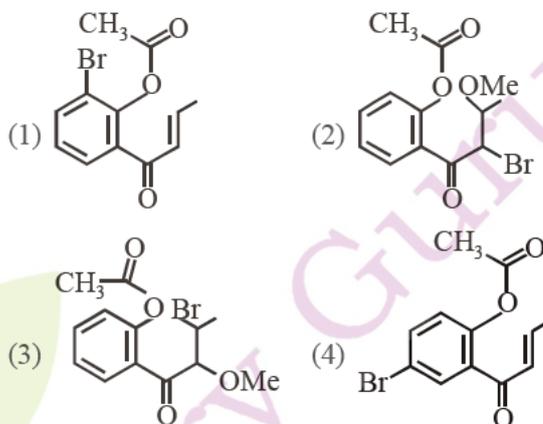
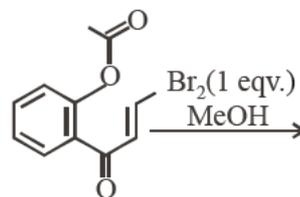
- (1) (A)→(Q); (B)→(S); (C)→(P)
 (2) (A)→(R); (B)→(Q); (C)→(P)
 (3) (A)→(Q); (B)→(S); (C)→(R)
 (4) (A)→(R); (B)→(S); (C)→(Q)

Ans. (1)

4. Taj Mahal is being slowly disfigured and discoloured. This is primarily due to :-
 (1) Water pollution
 (2) Global warming
 (3) Soil pollution
 (4) Acid rain

Ans. (4)

5. The major product obtained in the following conversion is :-

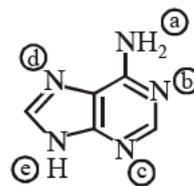


Ans. (2)

6. The number of bridging CO ligand (s) and Co-Co bond (s) in $\text{Co}_2(\text{CO})_8$, respectively are :-
 (1) 0 and 2 (2) 2 and 0
 (3) 4 and 0 (4) 2 and 1

Ans. (4)

7. In the following compound,



the favourable site/s for protonation is/are :-

- (1) (b), (c) and (d) (2) (a)
 (3) (a) and (e) (4) (a) and (d)

Ans. (1)

8. The higher concentration of which gas in air can cause stiffness of flower buds ?
 (1) SO_2 (2) NO_2
 (3) CO_2 (4) CO

Ans. (1)

9. The correct match between item I and item II is :-

Item I		Item II	
(A)	Allosteric effect	(P)	Molecule binding to the active site of enzyme
(B)	Competitive inhibitor	(Q)	Molecule crucial for communication in the body
(C)	Receptor	(R)	Molecule binding to a site other than the active site of enzyme
(D)	Poison	(S)	Molecule binding to the enzyme covalently

- (1) (A)→(P); (B)→(R); (C)→(S); (D)→(Q)
 (2) (A)→(R); (B)→(P); (C)→(S); (D)→(Q)
 (3) (A)→(P); (B)→(R); (C)→(Q); (D)→(S)
 (4) (A)→(R); (B)→(P); (C)→(Q); (D)→(S)

Ans. (4)

10. The radius of the largest sphere which fits properly at the centre of the edge of body centred cubic unit cell is : (Edge length is represented by 'a') :-

- (1) 0.134 a (2) 0.027 a
 (3) 0.067 a (4) 0.047 a

Ans. (3)

11. Among the colloids cheese (C), milk (M) and smoke (S), the correct combination of the dispersed phase and dispersion medium, respectively is :-

- (1) C : solid in liquid; M : solid in liquid;
 S : solid in gas
 (2) C : solid in liquid; M : liquid in liquid;
 S : gas in solid
 (3) C : liquid in solid; M : liquid in solid;
 S : solid in gas
 (4) C : liquid in solid; M : liquid in liquid;
 S : solid in gas

Ans. (4)

12. The reaction that does NOT define calcination is :-

- (1) $\text{ZnCO}_3 \xrightarrow{\Delta} \text{ZnO} + \text{CO}_2$
 (2) $\text{Fe}_2\text{O}_3 \cdot \text{XH}_2\text{O} \xrightarrow{\Delta} \text{Fe}_2\text{O}_3 + \text{XH}_2\text{O}$
 (3) $\text{CaCO}_3 \cdot \text{MgCO}_3 \xrightarrow{\Delta} \text{CaO} + \text{MgO} + 2 \text{CO}_2$
 (4) $2 \text{Cu}_2\text{S} + 3 \text{O}_2 \xrightarrow{\Delta} 2 \text{Cu}_2\text{O} + 2 \text{SO}_2$

Ans. (4)

13. The reaction,

$\text{MgO(s)} + \text{C(s)} \rightarrow \text{Mg(s)} + \text{CO(g)}$, for which $\Delta_r H^\circ = +491.1 \text{ kJ mol}^{-1}$ and $\Delta_r S^\circ = 198.0 \text{ JK}^{-1} \text{ mol}^{-1}$, is not feasible at 298 K. Temperature above which reaction will be feasible is :-

- (1) 1890.0 K (2) 2480.3 K
 (3) 2040.5 K (4) 2380.5 K

Ans. (2)

14. Given the equilibrium constant :

KC of the reaction :

$\text{Cu(s)} + 2\text{Ag}^+(\text{aq}) \rightarrow \text{Cu}^{2+}(\text{aq}) + 2\text{Ag(s)}$ is 10×10^{15} , calculate the E_{cell}^0 of this reaction at 298 K

$$\left[2.303 \frac{RT}{F} \text{ at } 298 \text{ K} = 0.059 \text{ V} \right]$$

- (1) 0.04736 V (2) 0.4736 V
 (3) 0.4736 mV (4) 0.04736 mV

Ans. (2)

15. The hydride that is NOT electron deficient is :-

- (1) B_2H_6 (2) AlH_3
 (3) SiH_4 (4) GaH_3

Ans. (3)

16. The standard reaction Gibbs energy for a chemical reaction at an absolute temperature T is given by

$$\Delta_r G^\circ = A - Bt$$

Where A and B are non-zero constants. Which of the following is TRUE about this reaction ?

- (1) Exothermic if $B < 0$
 (2) Exothermic if $A > 0$ and $B < 0$
 (3) Endothermic if $A < 0$ and $B > 0$
 (4) Endothermic if $A > 0$

Ans. (4)

17. K_2HgI_4 is 40% ionised in aqueous solution. The value of its van't Hoff factor (i) is :-

- (1) 1.8 (2) 2.2
 (3) 2.0 (4) 1.6

Ans. (1)

18. The de Broglie wavelength (λ) associated with a photoelectron varies with the frequency (ν) of the incident radiation as, [ν_0 is threshold frequency] :

(1) $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{3}{2}}}$ (2) $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{2}}}$

(3) $\lambda \propto \frac{1}{(\nu - \nu_0)^{\frac{1}{4}}}$ (4) $\lambda \propto \frac{1}{(\nu - \nu_0)}$

Ans. (2)

19. The reaction $2X \rightarrow B$ is a zeroth order reaction. If the initial concentration of X is 0.2 M, the half-life is 6 h. When the initial concentration of X is 0.5 M, the time required to reach its final concentration of 0.2 M will be :-

- (1) 18.0 h (2) 7.2 h
(3) 9.0 h (4) 12.0 h

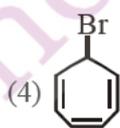
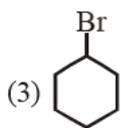
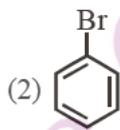
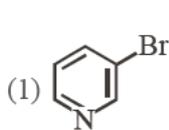
Ans. (1)

20. A compound 'X' on treatment with Br_2/NaOH , provided $\text{C}_3\text{H}_9\text{N}$, which gives positive carbylamine test. Compound 'X' is :-

- (1) $\text{CH}_3\text{COCH}_2\text{NHCH}_3$
(2) $\text{CH}_3\text{CH}_2\text{COCH}_2\text{NH}_2$
(3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CONH}_2$
(4) $\text{CH}_3\text{CON}(\text{CH}_3)_2$

Ans. (3)

21. Which of the following compounds will produce a precipitate with AgNO_3 ?



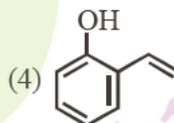
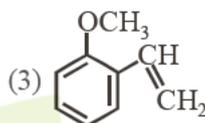
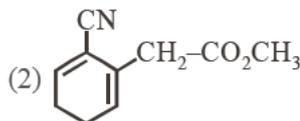
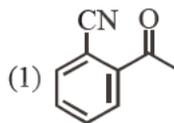
Ans. (4)

22. The relative stability of +1 oxidation state of group 13 elements follows the order :-

- (1) $\text{Al} < \text{Ga} < \text{Tl} < \text{In}$ (2) $\text{Tl} < \text{In} < \text{Ga} < \text{Al}$
(3) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$ (4) $\text{Ga} < \text{Al} < \text{In} < \text{Tl}$

Ans. (3)

23. Which of the following compounds reacts with ethylmagnesium bromide and also decolourizes bromine water solution :-



Ans. (4)

24. Match the following items in column I with the corresponding items in column II.

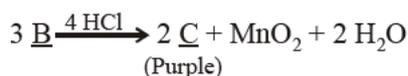
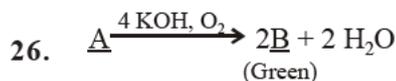
	Column I		Column II
(i)	$\text{Na}_2\text{CO}_3 \cdot 10 \text{H}_2\text{O}$	(P)	Portland cement ingredient
(ii)	$\text{Mg}(\text{HCO}_3)_2$	(Q)	Castner-Keller process
(iii)	NaOH	(R)	Solvay process
(iv)	$\text{Ca}_3\text{Al}_2\text{O}_6$	(S)	Temporary hardness

- (1) (i)→(C); (ii)→(B); (iii)→(D); (iv)→(A)
(2) (i)→(C); (ii)→(D); (iii)→(B); (iv)→(A)
(3) (i)→(D); (ii)→(A); (iii)→(B); (iv)→(C)
(4) (i)→(B); (ii)→(C); (iii)→(A); (iv)→(D)

Ans. (2)

25. 25 ml of the given HCl solution requires 30 mL of 0.1 M sodium carbonate solution. What is the volume of this HCl solution required to titrate 30 mL of 0.2 M aqueous NaOH solution?
 (1) 25 mL (2) 50 mL (3) 12.5 mL (4) 75 mL

Ans. (1)



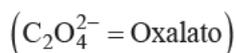
In the above sequence of reactions,

A and D respectively, are :-

- (1) KIO_3 and MnO_2 (2) KI and K_2MnO_4
 (3) MnO_2 and KIO_3 (4) KI and KMnO_4

Ans. (3)

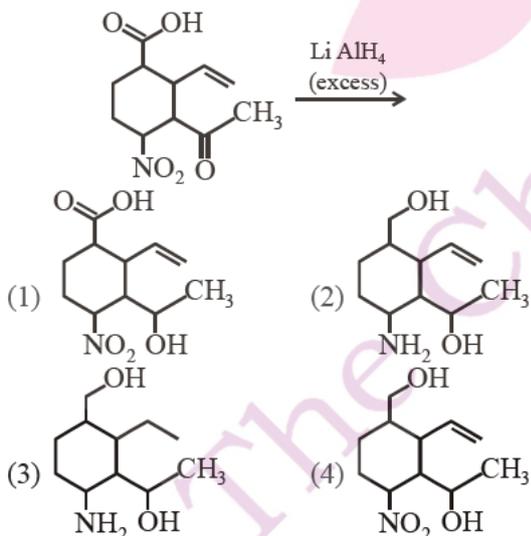
27. The coordination number of Th in $\text{K}_4[\text{Th}(\text{C}_2\text{O}_4)_4(\text{OH}_2)_2]$ is :-



- (1) 6 (2) 10 (3) 14 (4) 8

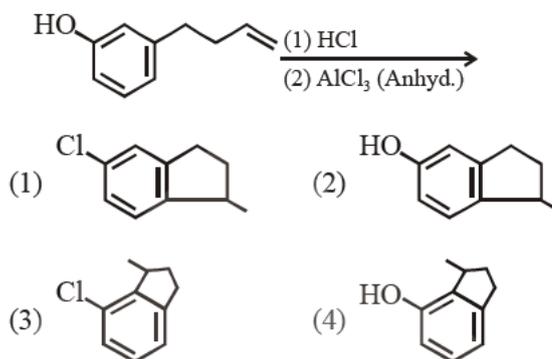
Ans. (2)

28. The major product obtained in the following reaction is :-



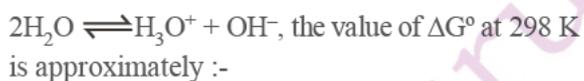
Ans. (2)

29. The major product of the following reaction is :-



Ans. (2)

30. For the equilibrium,



- (1) -80 kJ mol^{-1} (2) -100 kJ mol^{-1}
 (3) 100 kJ mol^{-1} (4) 80 kJ mol^{-1}

Ans. (4)