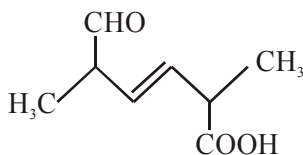


**FINAL JEE-MAIN EXAMINATION – SEPTEMBER, 2020**  
(Held On Wednesday 02<sup>nd</sup> SEPTEMBER, 2020) TIME : 9 AM to 12 PM

**CHEMISTRY**

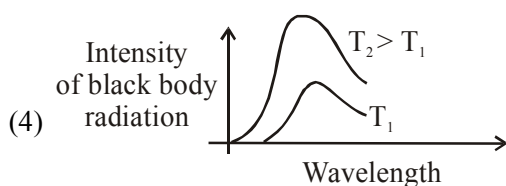
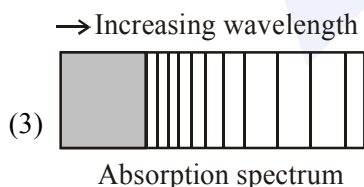
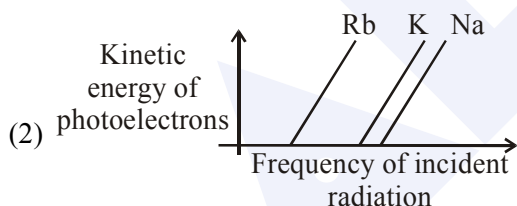
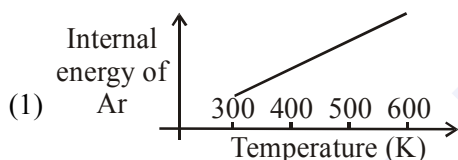
1. The IUPAC name for the following compound is:



- (1) 2, 5-dimethyl-6-carboxy-hex-3-enal  
(2) 6-formyl-2-methyl-hex-3-enoic acid  
(3) 2, 5-dimethyl-5-carboxy-hex-3-enal  
(4) 2, 5-dimethyl-6-oxo-hex-3-enoic acid

**Official Ans. by NTA (4)**

2. The figure that is a not a direct manifestation of the quantum nature of atoms is :



**Official Ans. by NTA (1)**

**TEST PAPER WITH ANSWER**

3. For the following Assertion and Reason, the correct option is

**Assertion (A) :** When Cu (II) and sulphide ions are mixed, they react together extremely quickly to give a solid.

**Reason (R) :** The equilibrium constant of  $\text{Cu}^{2+}(\text{aq}) + \text{S}^{2-}(\text{aq}) \rightleftharpoons \text{CuS}(\text{s})$  is high because the solubility product is low.

- (1) Both (A) and (R) are true and (R) is the explanation for (A)  
(2) Both (A) and (R) are false  
(3) (A) is false and (R) is true  
(4) Both (A) and (R) are true but (R) is not the explanation for (A)

**Official Ans. by NTA (4)**

4. If  $\text{AB}_4$  molecule is a polar molecule, a possible geometry of  $\text{AB}_4$  is :

- (1) Square pyramidal  
(2) Tetrahedral  
(3) Square planar  
(4) Rectangular planar

**Official Ans. by NTA (1)**

5. On heating compound (A) gives a gas (B) which is constituent of air. This gas when treated with  $\text{H}_2$  in the presence of a catalyst gives another gas (C) which is basic in nature. (A) should not be:

- (1)  $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$   
(2)  $\text{Pb}(\text{NO}_3)_2$   
(3)  $\text{NaN}_3$   
(4)  $\text{NH}_4\text{NO}_2$

**Official Ans. by NTA (2)**

6. In general, the property (magnitudes only) that shows an opposite trend in comparison to other properties across a period is

- (1) Electronegativity
- (2) Electron gain enthalpy
- (3) Ionization enthalpy
- (4) Atomic radius

**Official Ans. by NTA (4)**

7. The statement that is not true about ozone is :

- (1) in the stratosphere, it forms a protective shield against UV radiation.
- (2) it is a toxic gas and its reaction with NO gives  $\text{NO}_2$ .
- (3) in the atmosphere, it is depleted by CFCs.
- (4) in the stratosphere, CFCs release chlorine free radicals (Cl) which reacts with  $\text{O}_3$  to give chlorine dioxide radicals.

**Official Ans. by NTA (4)**

8. The metal mainly used in devising photoelectric cells is:

- (1) Na
- (2) Rb
- (3) Li
- (4) Cs

**Official Ans. by NTA (4)**

9. For octahedral Mn(II) and tetrahedral Ni(II) complexes, consider the following statements :

- (I) both the complexes can be high spin
- (II) Ni(II) complex can very rarely be low spin.
- (III) with strong field ligands, Mn(II) complexes can be low spin.
- (IV) aqueous solution of Mn(II) ions is yellow in color.

The **correct** statements are :

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

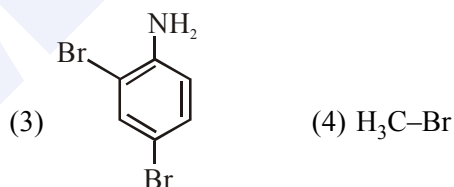
**Official Ans. by NTA (3)**

10. Consider that a  $d^6$  metal ion ( $M^{2+}$ ) forms a complex with aqua ligands, and the spin only magnetic moment of the complex is 4.90 BM. The geometry and the crystal field stabilization energy of the complex is :

- (1) tetrahedral and  $-1.6 \Delta_t + 1P$
- (2) tetrahedral and  $-0.6 \Delta_t$
- (3) octahedral and  $-1.6 \Delta_0$
- (4) octahedral and  $-2.4 \Delta_0 + 2P$

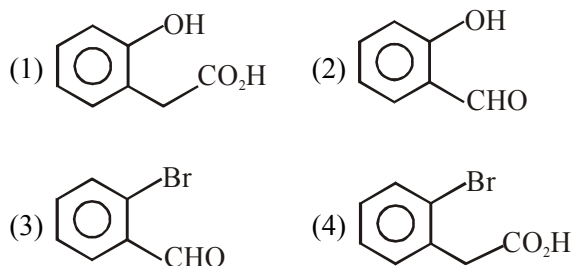
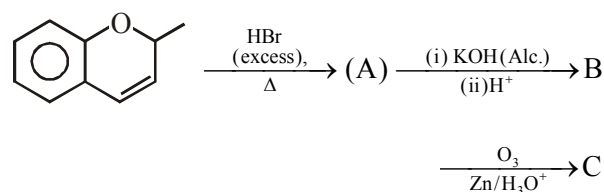
**Official Ans. by NTA (2)**

11. In Carius method of estimation of halogen, 0.172g of an organic compound showed presence of 0.08g of bromine. Which of these is the **correct** structure of the compound :



**Official Ans. by NTA (1)**

12. The major aromatic product C in the following reaction sequence will be :



**Official Ans. by NTA (2)**

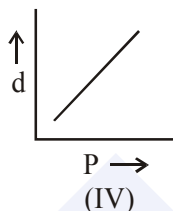
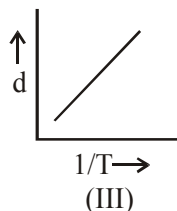
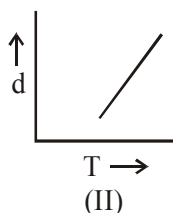
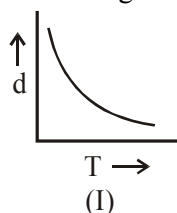
13. An open beaker of water in equilibrium with water vapour is in a sealed container. When a few grams of glucose are added to the beaker of water, the rate at which water molecules :

- (1) leaves the vapour increases
- (2) leaves the solution increases
- (3) leaves the solution decreases
- (4) leaves the vapour decreases

Official Ans. by NTA (1)

Official Ans. by ALLEN (3)

14. Which one of the following graphs is **not correct** for ideal gas ?

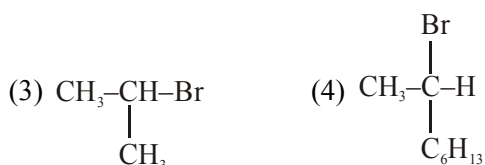
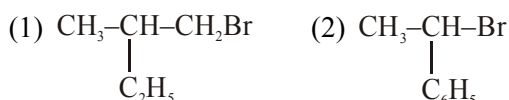


d = Density, P = Pressure, T = Temperature

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

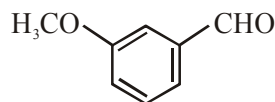
Official Ans. by NTA (1)

15. Which of the following compounds will show retention in configuration on nucleophilic substitution by OH<sup>-</sup> ion ?

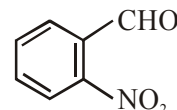


Official Ans. by NTA (1)

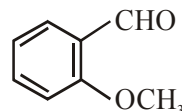
16. The increasing order of the following compounds towards HCN addition is :



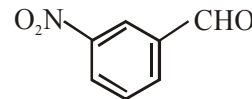
(i)



(ii)



(iii)



(iv)

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

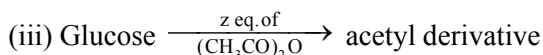
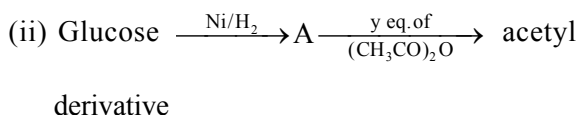
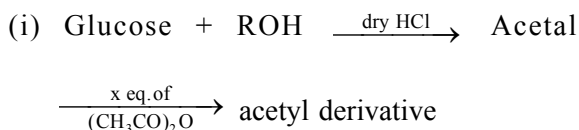
Official Ans. by NTA (3)

17. While titrating dilute HCl solution with aqueous NaOH, which of the following will **not** be required?

- (1) Clamp and phenolphthalein
- (2) Pipette and distilled water
- (3) Burette and porcelain tile
- (4) Bunsen burner and measuring cylinder

Official Ans. by NTA (4)

18. Consider the following reactions :

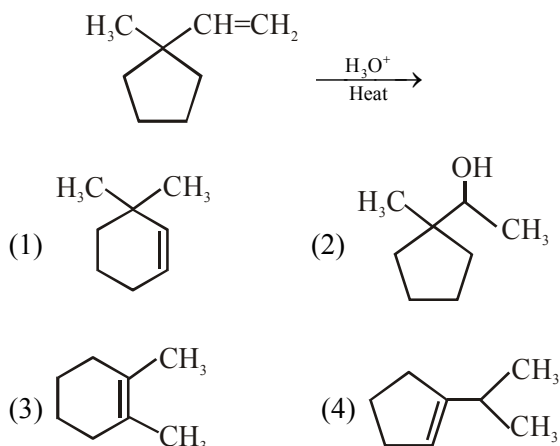


'x', 'y' and 'z' in these reactions are respectively.

- (1) 5, 6, & 5
- (2) 4, 5 & 5
- (3) 5, 4 & 5
- (4) 4, 6 & 5

Official Ans. by NTA (4)

19. The major product in the following reaction is :



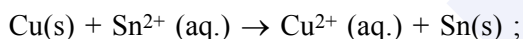
**Official Ans. by NTA (3)**

20. Which of the following is used for the preparation of colloids ?

- (1) Ostwald Process      (2) Van Arkel Method  
 (3) Bredig's Arc Method      (4) Mond Process

**Official Ans. by NTA (3)**

21. The Gibbs change (in J) for the given reaction at  $[Cu^{2+}] = [Sn^{2+}] = 1\text{ M}$  and 298K is :



$$(E_{Sn^{2+}|Sn}^0 = -0.16V, E_{Cu^{2+}|Cu}^0 = 0.34V,$$

$$\text{Take } F = 96500\text{ C mol}^{-1})$$

**Official Ans. by NTA (96500.00)**

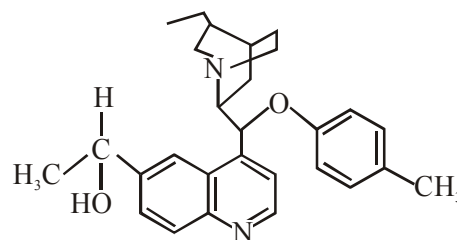
22. The mass of gas adsorbed,  $x$ , per unit mass of adsorbate,  $m$ , was measured at various pressures,

$p$ . A graph between  $\log \frac{x}{m}$  and  $\log p$  gives a straight line with slope equal to 2 and the intercept equal to 0.4771. The value of  $\frac{x}{m}$  at a pressure of 4 atm is : (Given  $\log 3 = 0.4771$ )

**Official Ans. by NTA (6.00)**

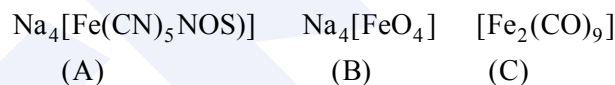
**Official Ans. by ALLEN (48.00)**

23. The number of chiral carbons present in the molecule given below is \_\_\_\_\_ .



**Official Ans. by NTA (5.00)**

24. The oxidation states of iron atoms in compounds (A), (B) and (C), respectively, are  $x$ ,  $y$  and  $z$ . The sum of  $x, y$  and  $z$  is \_\_\_\_\_ .



**Official Ans. by NTA (6)**

25. The internal energy change (in J) when 90g of water undergoes complete evaporation at 100°C is \_\_\_\_\_ .

(Given :  $\Delta H_{vap}$  for water at 373 K = 41 kJ/mol,  $R = 8.314\text{ JK}^{-1}\text{ mol}^{-1}$ )

**Official Ans. by NTA (189494.00)**

**Official Ans. by ALLEN (189494.39)**