

CHEMISTRY

TEST PAPER WITH ANSWER & SOLUTION

1. The set that contains atomic number of only transition element is -

- (1) 21, 32, 53, 64
- (2) 21, 25, 42, 72
- (3) 9, 17, 34, 38
- (4) 37, 42, 50, 64

Official Ans. by NTA (2)

2. The lanthanoid that does NOT show +4 oxidation state is

- (1) Dy
- (2) Eu
- (3) Ce
- (4) Tb

Official Ans. by NTA (2)

3. The INCORRECT statement is :

- (1) bronze is an alloy of copper and tin.
- (2) brass is an alloy of copper and nickel
- (3) cast iron is used to manufacture wrought iron.
- (4) german silver is an alloy of zinc, copper and nickel

Official Ans. by NTA (2)

4. The correct statement with respect to dinitrogen is :

- (1) liquid dinitrogen is not used in cryosurgery.
- (2) it can be used as an inert diluent for reactive chemicals.
- (3) it can combine with dioxygen at 25°C
- (4) N₂ is paramagnetic in nature.

Official Ans. by NTA (2)

5. A solution of two components containing n₁ moles of the 1st component and n₂ moles of the 2nd component is prepared. M₁ and M₂ are the molecular weights of component 1 and 2 respectively. If d is the density of the solution in g mL⁻¹, C₂ is the molarity and x₂ is the mole fraction of the 2nd component, then C₂ can be expressed as :

$$(1) C_2 = \frac{1000x_2}{M_1 + x_2(M_2 - M_1)}$$

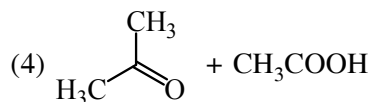
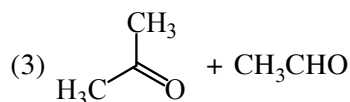
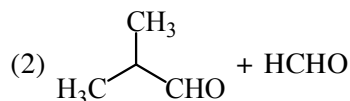
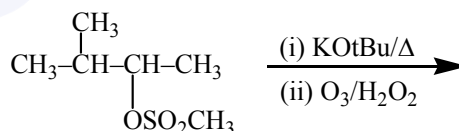
$$(2) C_2 = \frac{dx_2}{M_2 + x_2(M_2 - M_1)}$$

$$(3) C_2 = \frac{dx_1}{M_2 + x_2(M_2 - M_1)}$$

$$(4) C_2 = \frac{1000dx_2}{M_1 + x_2(M_2 - M_1)}$$

Official Ans. by NTA (4)

6. The major products of the following reaction are :



Official Ans. by NTA (1)

7. Kraft temperature is the temperature
- (1) below which the formation of micelles takes place.
 - (2) below which the aqueous solution of detergents starts freezing.
 - (3) above which the formation of micelles takes place.
 - (4) above which the aqueous solution of detergents starts boiling.

Official Ans. by NTA (3)

8. Consider the Assertion and Reason given below.

Assertion (A) : Ethene polymerized in the presence of Ziegler Natta Catalyst at high temperature and pressure is used to make buckets and dustbins.

Reason (R): High density polymers are closely packed and are chemically inert. Choose the correct answer from the following :

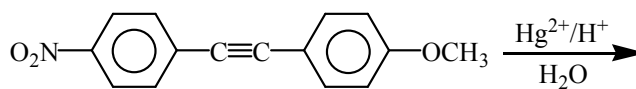
- (1) (A) is correct but (R) is wrong.
- (2) (A) and (R) both are wrong.
- (3) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (4) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

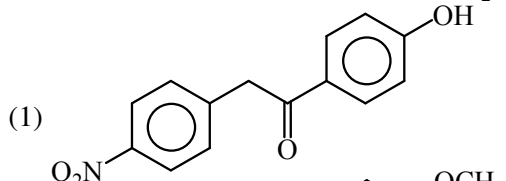
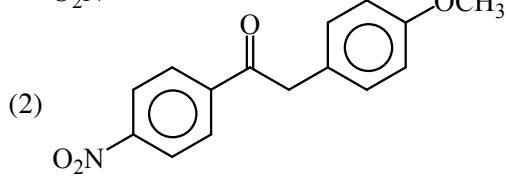
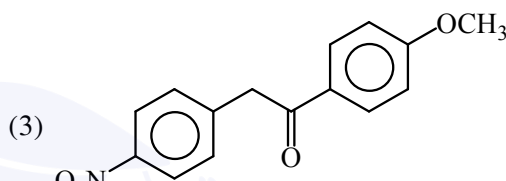
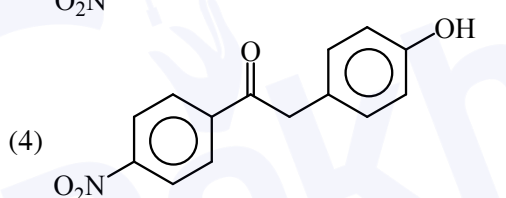
Official Ans. by NTA (3)

9. The species that has a spin only magnetic moment of 5.9 BM, is -
- (1) $\text{Ni}(\text{CO})_4(\text{T}_d)$
 - (2) $[\text{MnBr}_4]^{2-}(\text{T}_d)$
 - (3) $[\text{NiCl}_4]^{2-}(\text{T}_d)$
 - (4) $[\text{Ni}(\text{CN})_4]^{2-}$ (square planar)

Official Ans. by NTA (2)

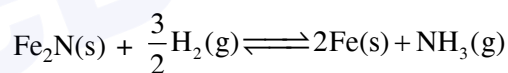
10. The major product obtained from the following reaction is -



- (1) 
- (2) 
- (3) 
- (4) 

Official Ans. by NTA (3)

11. For the reaction :



- (1) $K_C = K_P(\text{RT})$
- (2) $K_C = K_P(\text{RT})^{-1/2}$
- (3) $K_C = K_P(\text{RT})^{-3/2}$
- (4) $K_C = K_P(\text{RT})^{1/2}$

Official Ans. by NTA (4)

12. Arrange the following solutions in the decreasing order of pOH :

- (A) 0.01 M HCl
- (B) 0.01 M NaOH
- (C) 0.01 M CH_3COONa
- (D) 0.01 M NaCl

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

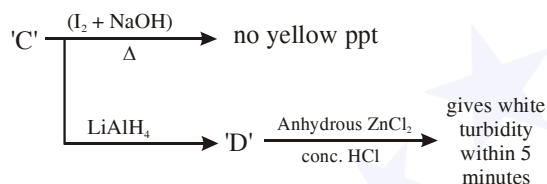
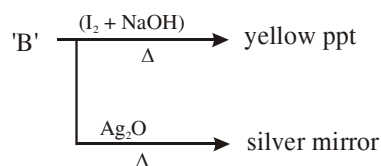
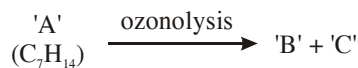
13. The presence of soluble fluoride ion upto 1 ppm concentration in drinking water, is :

- (1) harmful to bones
- (2) harmful for teeth
- (3) safe for teeth
- (4) harmful to skin

Official Ans. by NTA (3)

14. Consider the following reactions :

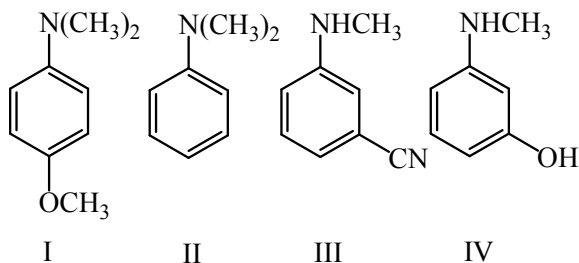
'A' is -



- (1)
- (2)
- (3)
- (4)

Official Ans. by NTA (2)

15. The increasing order of pK_b values of the following compounds is -



- (1) I < II < IV < III
- (2) II < IV < III < I

(3) II < I < III < IV

(4) I < II < III < IV

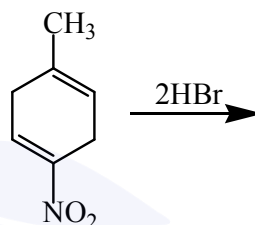
Official Ans. by NTA (1)

16. Among the sulphates of alkaline earth metals, the solubilities of $BeSO_4$ and $MgSO_4$ in water, respectively, are:

- (1) high and high
- (2) poor and poor
- (3) high and poor
- (4) poor and high

Official Ans. by NTA (1)

17. The major product of the following reaction is



- (1)
- (2)
- (3)
- (4)

Official Ans. by NTA (2)

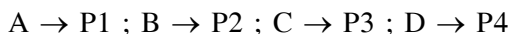
18. The variation of equilibrium constant with temperature is given below :

Temperature	Equilibrium constant
$T_1 = 25^\circ C$	$K_1 = 100$
$T_2 = 100^\circ C$	$K_2 = 100$

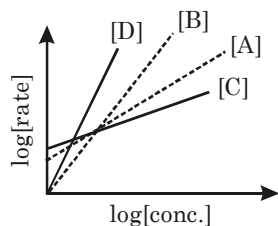
The values of ΔH° , ΔG° at T_1 and ΔG° at T_2 (in kJ mol^{-1}) respectively, are close to

- [Use $R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$]
- (1) 0.64, -5.71 and -14.29
 - (2) 28.4, -7.14 and -5.71
 - (3) 28.4, -5.71 and -14.29
 - (4) 0.64, -7.14 and -5.71

19. Consider the following reactions :



The order of the above reactions are a, b, c, and d, respectively. The following graph is obtained when $\log[\text{rate}]$ vs. $\log[\text{conc}]$ are plotted:



Among the following , the correct sequence for the order of the reactions is:

- (1) $a > b > c > d$
- (2) $c > a > b > d$
- (3) $d > b > a > c$
- (4) $d > a > b > c$

Official Ans. by NTA (3)

20. Which of the following compound shows geometrical isomerism

- (1) 2-methylpent-2-ene
- (2) 4-methylpent-1-ene
- (3) 4-methylpent-2-ene
- (4) 2-methylpent-1-ene

Official Ans. by NTA (3)

21. In an estimation of bromine by Carius method, 1.6 g of an organic compound gave 1.88 g of AgBr. The mass percentage of bromine in the compound is _____

(Atomic mass, Ag=108, Br = 80 g mol⁻¹)

Official Ans. by NTA (50.00)

22. The elevation of boiling point of 0.10 m aqueous CrCl₃.xNH₃ solution is two times that of 0.05m aqueous CaCl₂ solution. The value of x is_____.

[Assume 100% ionisation of the complex and CaCl₂, coordination number of Cr as 6, and that all NH₃ molecules are present inside the coordination sphere]

Official Ans. by NTA (5.00)

23. A spherical balloon of radius 3 cm containing helium gas has a pressure of 48×10^{-3} bar. At the same temperature, the pressure, of a spherical balloon of radius 12 cm containing the same amount of gas will be _____ $\times 10^{-6}$ bar.

Official Ans. by NTA (750.00)

24. The number of Cl = O bonds in perchloric acid is, " _____ "

Official Ans. by NTA (3.00)

25. Potassium chlorate is prepared by the electrolysis of KCl in basic solution



If only 60% of the current is utilized in the reaction, the time (rounded to the nearest hour) required to produce 10 g of KClO₃ using a current of 2 A is_____.

(Given : F = 96,500 C mol⁻¹ molar mass of KClO₃=122 gmol⁻¹)

Official Ans. by NTA (11.00)