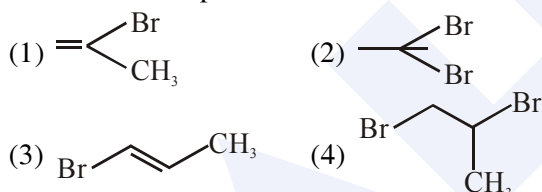


FINAL JEE-MAIN EXAMINATION – JANUARY, 2020
(Held On Tuesday 07th JANUARY, 2020) TIME : 9 : 30 AM to 12 : 30 PM
CHEMISTRY

1. A solution of m-chloroaniline, m-chlorophenol and m-chlorobenzoic acid in ethyl acetate was extracted initially with a saturated solution of NaHCO_3 to give fraction A. The left over organic phase was extracted with dilute NaOH solution to give fraction B. The final organic layer was labelled as fraction C. Fractions A, B and C, contain respectively :
- (1) m-chlorobenzoic acid, m-chloroaniline and m-chlorophenol
 - (2) m-chloroaniline, m-chlorobenzoic acid and m-chlorophenol
 - (3) m-chlorobenzoic acid, m-chlorophenol and m-chloroaniline
 - (4) m-chlorophenol, m-chlorobenzoic acid and m-chloroaniline

NTA Ans. (3)
ALLEN Ans. (3)

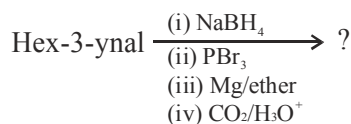
2. 1-methyl ethylene oxide when treated with an excess of HBr produces :

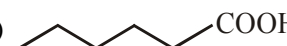
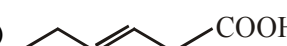



NTA Ans. (4)
ALLEN Ans. (4)

3. Amongst the following statements, that which was not proposed by Dalton was :
- (1) all the atoms of a given element have identical properties including identical mass. Atoms of different elements differ in mass.
 - (2) chemical reactions involve reorganisation of atoms. These are neither created nor destroyed in a chemical reaction.
 - (3) when gases combine or reproduced in a chemical reaction they do so in a simple ratio by volume provided all gases are at the same T & P.
 - (4) matter consists of indivisible atoms.

NTA Ans. (3)
ALLEN Ans. (3)
TEST PAPER WITH ANSWER

4. What is the product of following reaction ?



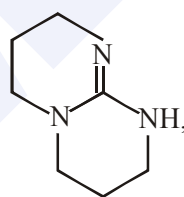
- (1) 
- (2) 
- (3) 
- (4) 

NTA Ans. (3)
ALLEN Ans. (3)

5. The increasing order of pK_b for the following compounds will be :



(A)



(B)



(C)

- (1) (A) < (B) < (C)
- (2) (C) < (A) < (B)
- (3) (B) < (A) < (C)
- (4) (B) < (C) < (A)

NTA Ans. (3)
ALLEN Ans. (3)

6. The atomic radius of Ag is closest to :

- (1) Cu
- (2) Hg
- (3) Au
- (4) Ni

NTA Ans. (3)
ALLEN Ans. (3)

7. The dipole moments of CCl_4 , CHCl_3 and CH_4 are in the order :

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

NTA Ans. (1)
ALLEN Ans. (1)

8. Given that the standard potentials (E°) of Cu^{2+}/Cu and Cu^+/Cu are 0.34 V and 0.522 V respectively, the E° of $\text{Cu}^{2+}/\text{Cu}^+$ is :
- (1) +0.158 V (2) 0.182 V
 (3) -0.182 V (4) -0.158 V

NTA Ans. (1)

ALLEN Ans. (1)

9. In comparison to the zeolite process for the removal of permanent hardness, the synthetic resins method is :
- (1) less efficient as it exchanges only anions
 (2) more efficient as it can exchange only cations
 (3) less efficient as the resins cannot be regenerated
 (4) more efficient as it can exchange both cations as well as anions

NTA Ans. (4)

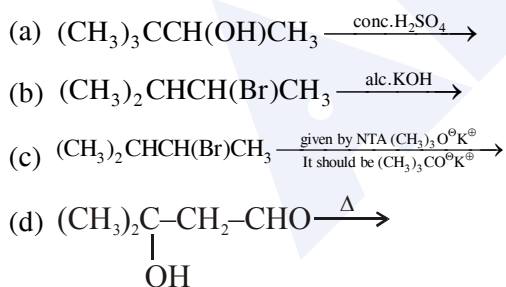
ALLEN Ans. (4)

10. The relative strength of interionic/intermolecular forces in decreasing order is :
- (1) ion-dipole > ion-ion > dipole-dipole
 (2) dipole-dipole > ion-dipole > ion-ion
 (3) ion-dipole > dipole-dipole > ion-ion
 (4) ion-ion > ion-dipole > dipole-dipole

NTA Ans. (4)

ALLEN Ans. (4)

11. Consider the following reactions :



Which of these reaction(s) will not produce Saytzeff product ?

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

NTA Ans. (1)

ALLEN Ans. (1)

12. The purest form of commercial iron is
- (1) scrap iron and pig iron
 (2) wrought iron
 (3) cast iron
 (4) pig iron

NTA Ans. (2)

ALLEN Ans. (2)

13. At 35°C , the vapour pressure of CS_2 is 512 mm Hg and that of acetone is 344 mm Hg. A solution of CS_2 in acetone has a total vapour pressure of 600 mm Hg. The false statement amongst the following is :
- (1) heat must be absorbed in order to produce the solution at 35°C
 (2) Raoult's law is not obeyed by this system
 (3) a mixture of 100 mL CS_2 and 100 mL acetone has a volume < 200 mL
 (4) CS_2 and acetone are less attracted to each other than to themselves

NTA Ans. (3)

ALLEN Ans. (3)

14. The electron gain enthalpy (in kJ/mol) of fluorine, chlorine, bromine and iodine, respectively are :
- (1) - 333, - 349, - 325 and - 296
 (2) -296, - 325, - 333 and - 349
 (3) - 333, - 325, - 349 and - 296
 (4) -349, - 333, - 325 and - 296

NTA Ans. (1)

ALLEN Ans. (1)

15. The number of orbitals associated with quantum numbers $n = 5$, $m_s = +\frac{1}{2}$ is :

- (1) 11 (2) 25 (3) 15 (4) 50

NTA Ans. (2)

ALLEN Ans. (2)

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16. Match the following :

- | | |
|--------------------|-----------------|
| (i) Riboflavin | (a) Beriberi |
| (ii) Thiamine | (b) Scurvy |
| (iii) Pyridoxine | (c) Cheilosis |
| (iv) Ascorbic acid | (d) Convulsions |

- (1) (i)-(c), (ii)-(a), (iii)-(d), (iv)-(b)
 (2) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)
 (3) (i)-(d), (ii)-(b), (iii)-(a), (iv)-(c)
 (4) (i)-(a), (ii)-(d), (iii)-(c), (iv)-(b)

NTA Ans. (1)

ALLEN Ans. (1)

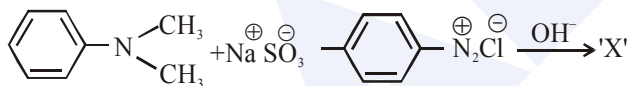
17. The theory that can completely/properly explain the nature of bonding in $[\text{Ni}(\text{CO})_4]$ is :

- (1) Werner's theory
 (2) Crystal field theory
 (3) Valence bond theory
 (4) Molecular orbital theory

NTA Ans. (4)

ALLEN Ans. (4)

18. Consider the following reaction :



The product 'X' is used :

- (1) in acid base titration as an indicator
 (2) in protein estimation as an alternative to ninhydrin
 (3) in laboratory test for phenols
 (4) as food grade colourant

NTA Ans. (1)

ALLEN Ans. (1)

19. The IUPAC name of the complex

$[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NH}_2\text{CH}_3)]\text{Cl}$ is :

- (1) Diammine (methanamine) chlorido platinum (II) chloride
 (2) Bisammine (methanamine) chlorido platinum (II) chloride
 (3) Diamminechlorido (aminomethane) platinum(II) chloride
 (4) Diamminechlorido (methanamine) platinum (II) chloride

NTA Ans. (4)

ALLEN Ans. (4)

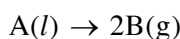
20. Oxidation number of potassium in K_2O , K_2O_2 and KO_2 , respectively, is :

- (1) +1, +4 and +2
 (2) +1, +2 and +4
 (3) +1, +1 and +1
 (4) +2, +1 and $+\frac{1}{2}$

NTA Ans. (3)

ALLEN Ans. (3)

21. For the reaction ;



$$\Delta U = 2.1 \text{ kcal}, \Delta S = 20 \text{ cal K}^{-1} \text{ at } 300 \text{ K}$$

Hence ΔG in kcal is _____ .

NTA Ans. (-2.70)

ALLEN Ans. (-2.70)

22. During the nuclear explosion, one of the products is ^{90}Sr with half life of 6.93 years. if $1 \mu\text{g}$ of ^{90}Sr was absorbed in the bones of a newly born baby in place of Ca, how much time, in years, is required to reduce it by 90% if it is not lost metabolically_____ .

NTA Ans. (23 to 23.03)

ALLEN Ans. (23.03)


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 2019
 Kevin Martin



Appear in ASAT
 on 19 Jan. 2020

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23. The number of chiral carbons in chloramphenicol is _____ .

NTA Ans. (2)

ALLEN Ans. (2.00)

24. Two solutions A and B, each of 100 L was made by dissolving 4g of NaOH and 9.8 g of H_2SO_4 in water, respectively. The pH of the resultant solution obtained from mixing 40 L of solution A and 10 L of solution B is_____.

NTA Ans. (10.60 to 10.60)

ALLEN Ans. (10.60)

25. Chlorine reacts with hot and concentrated NaOH and produces compounds (X) and (Y). Compound (X) gives white precipitate with silver nitrate solution. The average bond order between Cl and O atoms in (Y) is _____.

NTA Ans. (1.66 to 1.67)

ALLEN Ans. (1.66 or 1.67)

