CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 70

Chemistry

1. To a 10mL, 1M aqueous solution of Br_2, excess of NaOH is added so that all Br_2 is disproportionated to Br^- and BrO_3^-. The resulting solution is free from Br^-, by extraction and excess of OH^- neutralised by acidifying the solution. The resulting solution is suffcient to react with 2 g of impure CaC_2O_4(M= 128g/mol) sample. The % purity of oxalate sample is :

A. $84.3\ \%$

B. $32.5\ \%$

C. $60\ \%$

D. $64\ \%$

Answer: D

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2. Match the column.

Column I		Coulmn II	
(1)	SF_2	(p)	sp^3 and bent
(2)	XeF_4	(q)	Two lone pairs on central atom
(3)	$NOCl$	(r)	Bond angle $< 109.5^\circ$
(4)	NF_3	(s)	sp^2 and bent
		(t)	sp^3d^2 and square planar

A. (1) -p, q, r, (2) - q, r, t, (3) - s, (4) - r

B. (1) - p, q, (2) - q, s, t, (3) - s, (4) - r

C. (1) - p, q, r, (2) - q, s, t, (3) - r, (4) - s

D. (1) - p, q, (2) - q, r, t, (3) - r, (4) - s

Answer: A

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3. ΔG^{c-} or the reaction is ,

$4Al + 3O_2 + 6H_2O + 4\overset{c-}{O}H \rightarrow 4Al(OH)_4^{c-}$

$E^{c-}{}_{\cdot cell} = 2.73V$

$\Delta_f G^{c-}{}_{\cdot\left(\overset{c}{O}H\right)} = -157kJmol^{-1}$

$\Delta_f G^{c-}{}_{\cdot\left(\overset{c-}{O}H\right)} = -237kJmol^{-1}$

A. $-1580\ \text{kJ}$

B. $-1303\ \text{kJ}$

C. $-1260\ \text{kJ}$

D. $-1380\ \text{kJ}$

Answer: B

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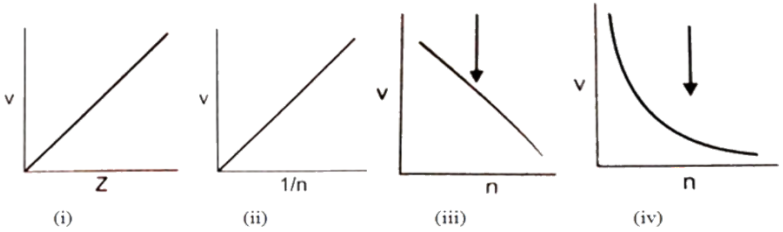
4. Which of the following graphs are correct for velocity of e^- in an orbita vs Z, $\frac{1}{n}$ and n?



A. (i), (ii)

B. (ii), (iv)

C. (i), (ii), (iii)

D. (i), (ii), (iv)

Answer: D

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5. Ethyl chloride on heating with AgCN fonns a compound (X). The functional isomer of (X) is:

A. C_2H_5CN

B. $C_2H_5NH_2$

C. C_2H_5NC

D. None of these

Answer: A

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6. Two first order reactions proceed at $25^\circ C$ at the same rate. The temperature coefficient of the rate of the first reaction is 2 and that of second reaction is 3. Find the ratio of the rates of these reactions at $75^\circ C$.

A. 7.0

B. 7.59

C. 6.52

D. 8.12

Answer: B

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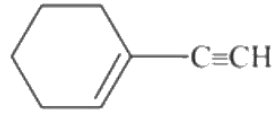
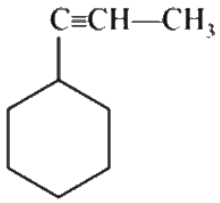


$\xrightarrow{(i)NaNH_2, NH_3 (ii) CH_3-Br} (A) \xrightarrow{H_2 \text{Lindlar'scatalyst}} B$

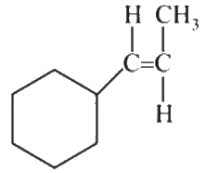
7.

$\xrightarrow{(i)\, NaNH_2, NH_3\, (ii)\, CH_3-Br} (A) \xrightarrow{(H_2 \text{ Lindlar'scatalyst})} B$

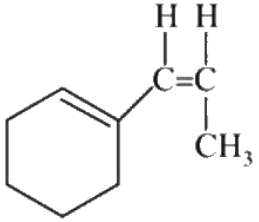
A.



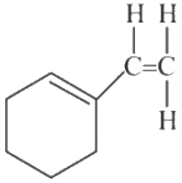
B.



C.



D.



Answer: C

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8. Which one of the following statements are true?

(1) Transition metals from alloys

(2) Transition metals form complexes

(3) Zn, Cd and Hg are transition metals

(4) $K_2[PtCl_6]$ is a well known compound, but corresponding nickel compound is not known.

A. 1, 2

B. 2, 4

C. 1, 2, 4

D. 2, 3, 4

Answer: C

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9. What is Z in the following reaction sequence?

$$C_6H_5NH_2 \xrightarrow{(i)\,NaNO_2+HCl\,/\,273K\,,\,(ii)\,H_3PO_2+H_2O\,,\,(iii)\,CO\,,HCl\text{anhy.}\,AlCl_3\,/\,CuCl} Z$$

.

A. $C_6H_5CO_2H$

B. C_6H_5OH

C. C_6H_5CHO

D. C_6H_6

Answer: C

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10. Match the compound listed in Column I with characteristic listed in Column II

Column I		Column II	
(1)	BeO(s)	(p)	Amphoteric in nature
(2)	$NaHCO_3$ (crystalline)	(q)	Imparts characteristic colour to Bunsen Flame
(3)	$BeCl_2$	(r)	Produce H_2O_2 and O_2 on reaction with H_2O
(4)	CsO_2	(s)	Shows H-bonding
		(t)	Have a chain structure

A. (1) - p, r, (2) - p, q, t, (3) - t, (4) - q, r

B. (1) - p, r, (2) - p, s, t, (3) - t, (4) - q

C. (1) - p, (2) - p, q, s, t, (3) - t, (4) - q, r

D. (1) - p, (2) - p, s, t, (3) - t, (4) - q

Answer: C

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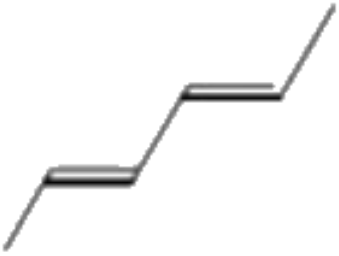
11. The correct order of heat and combustion for the following alkadienes is

(i) 

(ii) 

(iii) 

A. $(ii) < (iii) < (i)$

B. $(i) < (ii) < (iii)$

C. $(iii) < (ii) < (i)$

D. $(i) < (iii) < (ii)$

Answer: B

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12. A compound formed by elements X and Y crystallises in a cubic structure in which atoms X are at the corners of the cube and atoms Y are at two non - adjacent face - centres. The formula of the compound is

A. X_3Y

B. XY

C. XY_2

D. XY_3

Answer: B

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13. The number of oxygen atoms in borax which do not from $p\pi - p\pi$ back bond is:

A. 3

B. 4

C. 2

D. None of these

Answer: C

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14. Pick out the incorrect statement.

A. I_2O_5 is formed by heating HIO_3 to $170^\circ C$

B. I_2O_5 is stable to heat

C. I_2O_5 is used in the estimation of CO

D. I_2 combines with O_3 to form I_4O_9. When heated above $75^\circ C$, it (I_4O_9) decomposes to form I_2O_5.

Answer: B

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15. What is the correct sequence of the increasing order of freezing points at one atmosphere of the following 1.0 M aqueous solution?

1. Urea, 2. Sodium chloride, 3. Sodium sulphate, 4. Sodium phosphate.

Select the correct answer using the codes given below

A. 4, 3, 1, 2

B. 3, 4, 2, 1

C. 3 4, 1, 2

D. 4, 3, 2, 1

Answer: D

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16. Formaldehyde gives an additive product with Methylmagnesium iodide which in aqueous hydrolysis gives

A. Isopropyl alcohol

B. Ethyl alcohol

C. Methyl alcohol

D. Propyl alcohol

Answer: B

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17. In presence of concentrated alkalie $\left(OH^{-}\right)$, trimethyl acetaldehyde undergoes the

A. Aldol condensation

B. Witting reaction

C. Cannizzaro reaction

D. Perkin reaction

Answer: C

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18. An aldohexose (e.g., glucose) and 2 - oxohexose (e.g., fructose) can be distinguished with the help of

A. Tollen's reagent

B. Fehling's solution

C. Benedict solution

D. $Br_2 + H_2O$

Answer: D

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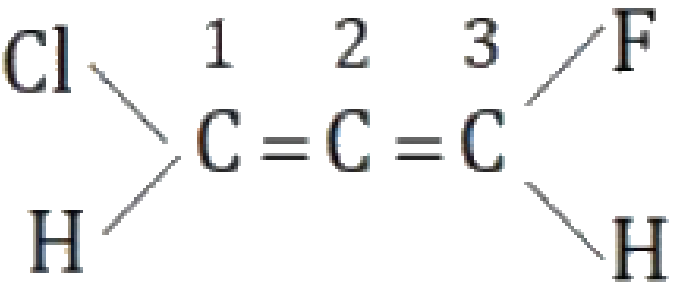
19. Consider the following molecule



If $\pi -$ electron cloud of $C_1 - C_2$ is present in the plane of paper then which of the following is/are correct

A. Fluorine is perpendicular to the plane of paper

B. chlorine is present in the plane of paper

C. $\sigma -$ bond of $C_2 - C_3$ si perpendicular to the plane of paper

D. $\pi -$ electron cloud of $C_2 - C_3$ bond and Cl is present in same plane

Answer: D

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20. The composition of the equilibrium mixture for the equilibrium $Cl_2 \Leftrightarrow 2Cl$ at $1470^\circ K$, may be determined by the rate of diffusion of mixture through a pin hole. It is found that at $1470^\circ K$, the mixture diffuses 1.16 times as fast as krypton (83.8) diffuses under the same conditions. Calculate the % degree of dissociation of Cl2 at equilibrium.

A. 0.14

B. 0.41

C. 0.91

D. 0.24

Answer: A

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21. The conductance of 0.0015 M aqueous solution of a weak monobasic acid was determined by using a conductivity cell consisting of platinized Pt electrodes. The distance between the electrodes is 120 cm with an area of cross-section of $1cm^2$. The conductance of this solution was found to be $5 \times 10^{-7}S$. The pH of the solution is 4. Calculate the value of limiting molar conductivity.

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22. Gaseous benzene reacts with hydrogen gas in presence of a nickel catalyst to form gaseous cyclohexane according to the reaction:

$C_6H_6(g) + 3H_2(h) \Rightarrow C_6H_{12}(g)$

A mixture of C_6H_6 and excess H_2 has a pressure of 60 mm of Hg in an unknown volume. After the gas has been passed over a nickel catalyst and all the benzene converted to cyclohexane, the pressure of the gas was 30 mm of Hg in the same volume and temperature. The fraction of C_6H_6 (by volume) present in the original mixture is :

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23. What is maximum pH required to prevent the precipitation of ZnS in a solution that is 0.01 M $ZnCl_2$ and saturated with 0.10M H_2S?

[Given : $K_{sp}(ZnS) = 10^{-21}$,

$K_{a_1} \times K_{a_2}$ (of H_2S)=10^{-20}]

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24. Write the structures and IUPAC names of all the cyclic isomers (alcohols) with the molecular with the molecular formula C_4H_7OH.

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25. A weak field complex of Ni^{2+} has magnetic moment of 2.82 BM. The number of electron in the t_{2g} level of Ni^{2+} will be

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