CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 58

Chemistry

1. The correct bond order in the following species is:

A. $O_2^{2+} < O_2^{+} < O_2^{-}$

B. $O_2^{+} < O_2^{-} < O_2^{2+}$

C. $O_2^{-} < O_2^{+} < O_2^{2+}$

D. $O_2^{2+} < O_2^{-} < O_2^{+}$

Answer: C

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2. Which of the following is the strongest reducing agent in aqueous medium?

A. Na

B. Li

C. K

D. Cs

Answer: B

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3. What will be the relation between the T_1 of gas 1 with $M_1 = 56$ and T_2 of gas 2 with $M_2 = 44$ if the average speed of gas 1 is equal to most probable speed of gas 2?

A. $T_1 = T_2^2$

B. $T_1 = T_2$

C. $T_1 = (T_2)^{\frac{1}{2}}$

D. $T_1 = \frac{1}{T_2}$

Answer: B

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4. Consider the following reaction :

$$xMnO_4^- + yC_2O_4^{2-} + zH^+ \rightarrow xMn^{2+} + 2yCO_2 + \frac{z}{2}H_2O$$

The value of x, y and z in the reaction are, respectively.

A. 5, 2 and 8

B. 2, 5 and 8

C. 2, 5 and 16

D. 5, 2 and 16

Answer: C

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5. What will be the correct decreasing order of acid strength of the hydroxybenzoic acids? (Symbols and notations carry their usual meanings)

A.

$$p - Hydroxybenzoicacid > benzoicacid > m - hydroxybenzoicacid$$

B.

$$o - Hydroxybenzoicacid > m - hydroxybenzoicacid > benzoicacid$$

C.

$$o - Hydroxybenzoicacid > benzoicacid > m - hydroxybenzoicacid$$

D.

$$m - Hydroxybenzoicacid > benzoicacid > o - hydroxybenzoicacid$$

Answer: B

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6. The specific rotation of a pure enantiomer is $+10^{\circ}$. The observed rotation, if it is isolated from a reaction with $30\,\%$ recemisation and $70\,\%$ inversion is

A. $+10^{\circ}$

B. -10°

C. 3°

D. -7°

Answer: D

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7. A certain reaction occurs in two steps as

(I) $2SO_{2(g)} + 2NO_{2(g)} \rightarrow 2SO_{3(g)} + 2NO_{(g)}$

$(ii) 2NO_{(g)} + O_2(g) \rightarrow 2NO_{2(g)}$

In the reaction ,_____.

A. $NO_{2(g)}$ in intermediate

B. $NO_{(g)}$ intermediate

C. $NO_{(g)}$ is catalyst

D. $O_{2(g)}$ is intermediate

Answer: B

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8. An ideal gas is expand from (P_1, V_1, T_1) to (P_2, V_2, T_2) under different conditions. The correct statement(s) among the following is (are):

A. The word done by the gas is less when it is expanded reversibly from V_1 to V_2 under adiabatic conditions as compared to that when expanded reversibly from V_1 to V_2 under isothermal conditions

B. The change in internal energy of the gas is (i) zero, if it is expanded reversibly with $T_1 = T_2$ and (ii) positive, if it is exapnded reversibly under adiabatic conditions with $T_1 \neq T_2$

C. If the expansion is carried out freely, it is simultaneously both isothermal as well as adiabatic

D. The work done on the gas is maximum when it is compressed irreversibly from (P_2, V_2) to (P_1, V_1) against constant pressure P_1

Answer: B

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9. Which of the following electrolytes will have maximum coagulating value for Ag/Ag^+ sol?

A. Na_2S

B. Na_2PO_4

C. Na_2SO_4

D. $NaCl$

Answer: D

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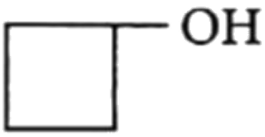
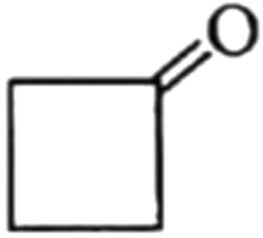
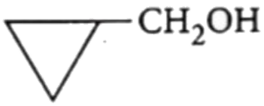
10. The possible product obtained from the reaction of cyclobutyl amine with HNO_2 followed by treating with water is

A. 

B. 

C. 

D. Both A and C

Answer: D

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11. Consider the reaction equilibrium, $2SO_{2(g)} + O_{2(g)} \Leftrightarrow SO_3(g), \Delta H^\circ = -198kJ$. On the basis of Le-Chatelier's principle, the condition favourable for the forward reaction is

A. Lowering of temperature as well as pressure

B. Increasing temperature as well as pressure

C. Lowering the temperature and increasing the pressure

D. Any value of temperature and pressure

Answer: C

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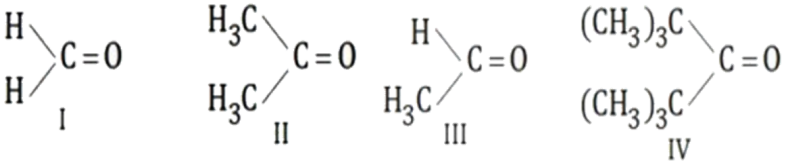
12. The correct order of reactivity for the addition reaction of the following carbonly compounds with ethyl magnesium iodide is



A. $I > III > II > IV$

B. $IV > III > II > I$

C. $I > II > IV > III$

D. $III > II > I > IV$

Answer: A

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13. For the reaction,

$$A + B \rightarrow P, \ -\frac{d[A]}{dt} = -\frac{d[B]}{dt} = k[A][B] \text{ and } Rt = \frac{1}{[A_0] - [B]_0} \ln. \frac{[A}{[B}$$

when $[A]_0 \neq [B]_0$

If $[A]_0 = [B]_0$ then the integrated rate law will be

A. $kt = \ln. \frac{[A]}{[B]}$

B. $\frac{1}{[B]} = \frac{1}{[A]_0} + kt$

C. $\frac{1}{[A]} = \frac{1}{[A]_0} + kt$

D. $\frac{1}{[A]} = \frac{1}{[A]_0} + kt$ or $\frac{1}{[B]} = \frac{1}{[B]_0} + kt$

Answer: D

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14. Which of the following cations has the strongest tendency towards complex formation?

A. Sm^{3+}

B. Lu^{3+}

C. Gd^{3+}

D. Yb^{3+}

Answer: B

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15. Which chemical change among the following involves absorption of heat?

A. $CaO + H_2O \rightarrow Ca(OH)_2$

B. $Na(g) \rightarrow Na^+(g) + e^-$

C. $\underset{\text{conc.}}{H_2SO_4} + \underset{\text{excess}}{H_2O} \rightarrow H_2SO_4(aq)$

D. $Al^{3+} + 6H_2O \rightarrow \left[Al(H_2O)_6\right]^{3+}$

Answer: B

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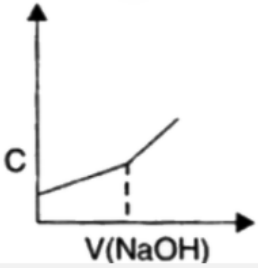
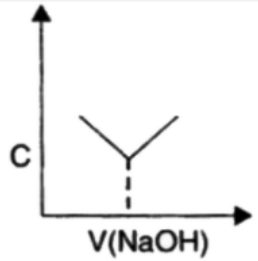
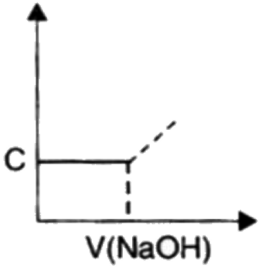
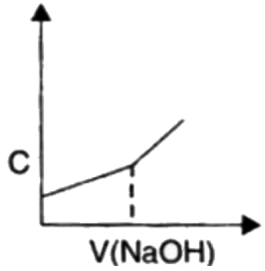
16. Which of the following curve will represent the variation of conductance C during titration of CH_3COOH by gradual addition of NaOH solution (V)

A. 

B. 

C. 

D.



Answer: D

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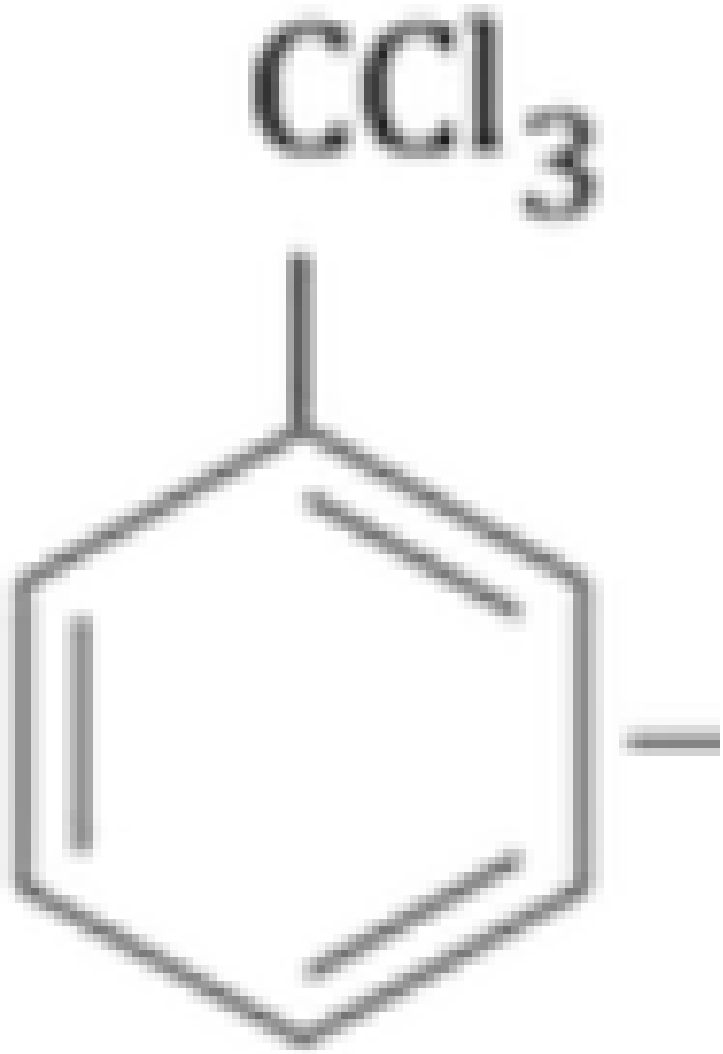

17.

$$\xrightarrow{Ca(OH)_2(aq)} A \xrightarrow[Br_2+NaOH]{NH_3/\Delta} B \xrightarrow{Br_2/H_2O} C$$

In the above sequence, C is

A. 1, 2, 3 - Tribromobenzene

B. 2, 4, 6 - Tribromoaniline

C. A mixture of o - and p - Bromoaniline

D. 1, 3, 5 - Tribromoaniline

Answer: B

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18. The electrode potential, E°, for the reduction of MnO_4^- to Mn^{2+} in acidic medium is $+1.51V$. Which of the following metal(s) will be oxidised? The reduction reactions and standard electrode potentials for Zn^{2+}, Ag^{+} and Au^{+} are given as

$Zn^{2+}_{(aq)} + 2e^- \rightarrow Zn_{(s)}, E^{\circ} = -0.762V$

$Ag^{+}_{(aq)} + e^- \Leftrightarrow Ag_{(x)}, E^{\circ} = +0.80V$

$Au^{+}_{(aq)} + e^- \Leftrightarrow Au_{(s)}, E^{\circ} = +1.69V$

A. Zn and Au

B. Ag and Au

C. Au

D. Zn and Ag

Answer: D

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19. What final product will form when alcoholic KOH is treated with 1, 1-dichloroethane?

A. Ethane-1, 2-diol

B. Ethene

C. Ethyne

D. Acetaldehyde

Answer: C

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20. Consider the following antibiotics

(i) Erythromycin

(ii) Ofloxacin

(iii) Chloramphenicol

(iv) Penicillin

The pair of bactericidal antibodies is

A. $i - iii$

B. $ii - iv$

C. $ii - v$

D. $i - iv$

Answer: B

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21. How many statements is/are correct for given complex $\left[Co(C_2O_4)_3\right]^{3-}$

i) It contain negative ligands only

ii) The oxidation state of central metal atom is $+3$

iii) it is optically active

iv) Due to chelation the stability of the complex increases

v) It exhibit geometrical isomerism

vi) it is octahedral with d^2sp^3 hybridization.

vii) All oxalate ligands are replaced by ethylenediamine, then complex do not show optical activity.

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22. The number of alkenes (including stereoisomers) which can produce 2 - butanol by the successive treatment of (i) B_2H_6 in tetrahydrofuran solvent and (ii) alkaline H_2O_2 solution is/are

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23. The K_{sp} of $Mg(OH)_2$ is 1×10^{-12}. $0.01MMg(OH)_2$ will precipitate at the limiting pH

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24. An organic compound A (mol wt = 180) is acylated with CH_3COCl to get acylated compound of mol wt. 390. What is the number of amino groups present per molecule of the compound A?

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25. 1.5 gm sample of bleaching power was suspended in water. If was treated with CH_3COOH followed by the addition of excess of Kl. The liberated iodine required 150 mL of $\frac{M}{10}$ hypo solution for complete titration. The percentage of available chlorine in the sample is

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