CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA NEET SET 37

Chemistry

1. The molarity of HNO_3 in a sample which has density 1.4 g/mL and mass percentage of $63\ \%$

is _____.

(Molecular Weight of $HNO_3 = 63$)

A. 7 M

B. 14 M

C. 2.1 M

D. 28 M

Answer: B

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2. The de Broglie wavelength of an electron in the 3rd Bohr orbit is

A. $2\pi a_0$

B. $4\pi a_0$

C. $6\pi a_0$

D. $8\pi a_0$

Answer: C

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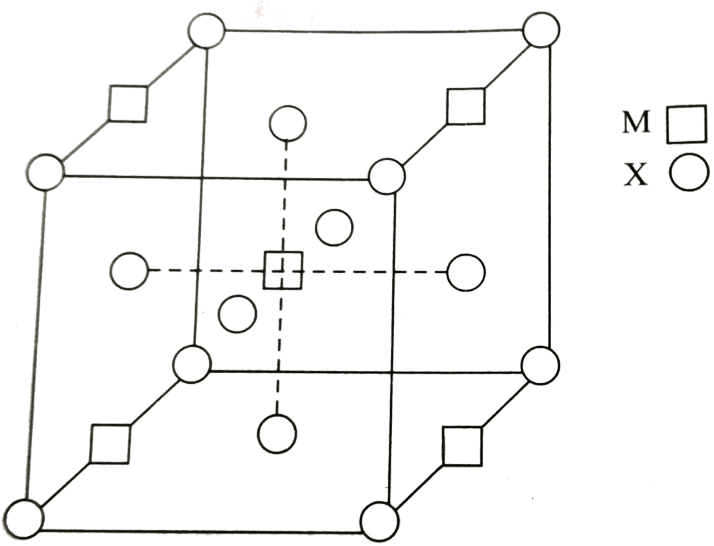
3. A compound M_pX_q has cubic close packing (p) arrangement of X. Its unit cell structure is shown below. The empirical formula of the compound is



a. MX **b.** MX_2 **c.** M_2X

A. M_2X

B. $M + 5X_{14}$

C. MX_2

D. MX

Answer: C

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4. Using the data provided, calculate the multiple bond energy $\left(kJmol^{-1}\right)$ of a $C \equiv C$ bond in C_2H_2. That energy is (take the bond energy of a $C - H$ bond as $350kJmol^{-1}$).

$2C_{(s)} + H_{2(g)} \rightarrow C_2H_{2(g)}, \Delta = 225kJmol^{-1}$

$2C_{(s)} \rightarrow 2C_g\big), \Delta H = 1410 kJ mol^{-1}$

$H_{2(g)} \rightarrow 2H_{(g)}, \Delta H = 330 kJ mol^{-1}$

A. 837

B. 1165

C. 815

D. 865

Answer: C

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5. At constant volume , 4 moles of an ideal gas when heated from 300 K to 500 K change its internal energy by 5000 J. The molar heat capacity at constant volume is ?

A. 3.125

B. 6.25

C. 6.75

D. -6.75

Answer: B

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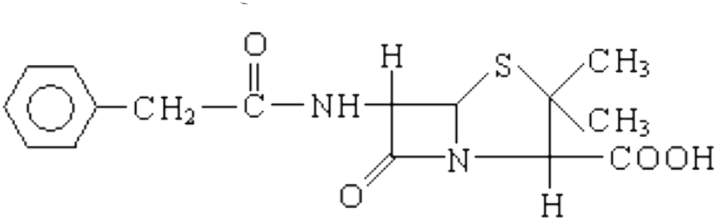
6. The following structure is known as



A. Ampicillin

B. Penicillin - K

C. Penicillin - G

D. Penicillin - F

Answer: C

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7. Select the set having correct statements pertaining to the adsorption of a gas on a solid surface

(1) physisortion may transform into chemisorption at high temperature (2) chemisorption is more exothermic than physisortion , however it is very slow due to higher energy of activation

(3) Adsorption is always exothermic

(4) Physiosorption increase with increasing

temperature but chemisorption decreases with increasing temperature

A. 1,2

B. 2,3

C. 1,2,3

D. 1,2,4

Answer: C

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8. 108 g of silver (molar mass $108g - mol^{-1}$) is deposited at cathode from solution by a certain quantity of electricity. The volume (in L) of oxygen gas produced at 273 K and 1 bar pressure from water by the same quantity of electricity is _____.

A. 2.82 L

B. 5.675 . L

C. 1.41 L

D. 0.746 L

Answer: B

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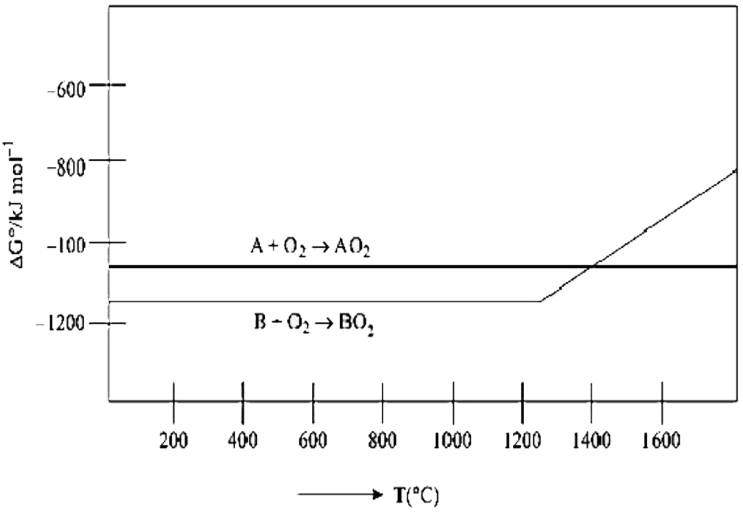
9. According to the following diagram, A reduces BO_2 When the temperature is



A. $> 1400^\circ C$

B. $> 1200^\circ C$ but $< 1400^\circ C$

C. $> 1400^\circ C$

D. $> 1200^\circ C$

Answer: A

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10. Consider the following E° values E° values $E^\circ_{Fe^{3+}/Fe^{2+}} = 0.77v$, $E^\circ_{Sn^{2+}/Sn} = -0.14$ under standard condition

the potential for the reaction

$$Sn_s + 2Fe^{3+}(aq) \rightarrow 2Fe^{2+}(aq) + Sn^{2+}(aq)$$

is :

A. 1.68 V

B. 0.91 V

C. 0.63 V

D. 1.46 V

Answer: B

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11. Which one of the following statements is not true ?

A. Oxides of sulphur, nitrogen and carbon are the most widespread air pollutants

B. pH od drinking water should be between 5.5 - 9.5

C. Concentration of DO below 6 ppm is good for the growth of fish

D. Clean water would have a BOD value of less than 5 ppm

Answer: C

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12. The material used to make anode and cathode of the commonly employed dry cells are

A. aluminum and lead

B. zinc and carbon

C. an alloy of silver , copper and manganese

D. brass and a mixture of ammonium chloride and manganese

Answer: B

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13. Pb on reaction with conc. HNO_3 gives

A. $Pb(NO_3)_4 + NO_3$

B. $Pb(NO_3)_3 + N_2O$

C. $Pb(NO_3)_2 + NO_2$

D. $PbNO_3 + NO$

Answer: C

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14. The reaction of white phosphorus with aqueous $NaOH$ gives phosphine along with another phosphorus containing compound. The reacation type, the oxidation states of phosphorus in phosphine and the other product are respectvely:

A. Redox reaction , +3 and +5

B. Redox reaction , -3 and -5

C. Disproportionation reaction , -3 and +3

D. Disproportionation reaction , -3 and +1

Answer: C

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15. Which of the following is least soluble ?

A. $NiS\left(K_{sp}=3\times10^{-21}\right)$

B. $FeS\left(K_{sp}=4\times10^{-19}\right)$

C. $MnS\left(K_{sp}=7\times10^{-16}\right)$

D. $PtS\left(K_{sp}=8\times10^{-73}\right)$

Answer: D

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16. The catalytic activity of the transition metals and their compound is described to:

A. Their ability of adopt variable oxidation states

B. Their chemical reactivity

C. Their magnetic behaviour

D. Their unfilled d - orbitals

Answer: A

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17. The colour of light absobed by an aqueous solution of $CuSO_4$ is

A. Blue green

B. Yellow

C. Violet

D. Orange - red

Answer: D

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18. A bubble of air released by a diver at the bottom of a pool of water become large as it approaches the surface of the water . Assume the temperature is constant and select the true statement. The pressure inside the bubble is

A. greater near the bottom of the water

B. greater near the top of the water

C. same at all depths

D. cannot be determined from the given data

Answer: A

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19. After equal volume of $0.10M$ solutions of $(NH_4)_2SO_4$ and $Ba(OH)_2$ have been mixed, which of the following species is present in greatest concentration in solution?

A. $Ba^{2+}(aq)$

B. $BaSO_4(aq)$

C. $NH_4^+(aq)$

D. $NH_3(aq)$

Answer: D

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20. The correct order of increasing covalent character is :

A. $LiCl > NaCl > BeCl_2$

B. $BeCl_2 > NaCl > LiCl_2$

C. $NaCl > LiCl > BeCl_2$

D. $BeCl_2 > LiCl > NaCl$

Answer: C

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21. A knocking sound is produced in the internal combustion engine when the fuel

A. burns fast

B. burns slowly

C. is contaminated with lubricating oil

D. contains some water

Answer: A

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22. Which of the following is the most preferred conformation of ethane molecule

A. Staggered

B. Skew

C. Eclipsed

D. None of the above

Answer: A

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23. Which one of the following processes is used for the manufacturing of calcium ?

A. Reduction with CaO with hydrogen

B. Electrolysis of molten $Ca(OH)_2$

C. Electrolysis of a mixture of anhydrous

$CaCl_2$ and CaF_2

D. Reduction of CaO with carbon

Answer: C

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24. IUPAC nomenclature of

$$CH_3 - \underset{\underset{CH_2-CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH = \overset{\overset{CH_3}{|}}{C} - CH_3$$ is

A. 4 - ethyl -2, 4 - dimethylpent - 2 - ene

B. 2,4,4 - trimethylhex - 2- ene

C. 3,3,5 - trimethylhex -4 -ene

D. 2,2,4 - trimethylhex -3 -ene

Answer: B

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25. In the following reaction, the product 'R' is:

$$CaC_2 \xrightarrow{H_2O} P \xrightarrow[\text{tube}]{\text{hot iron}} Q \xrightarrow[AlCl_3]{CH_3Cl} R$$

A. toluene

B. n - propylbenzene

C. ethylbenzene

D. benzene

Answer: A

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26. Select the incorrect statement about the following :

A. O_3 molecular is angular in shape

B. In O_3 , O - O bond length is identical with that of molecular oxygen

C. O_3 is used as germicide for purification of air

D. O_3 is an oxidizing agent

Answer: B

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27. In brown ring complex compound $\left[Fe(H_2O)_5NO\right]SO_4$, the oxidation state of Fe is-

A. $+1$

B. $+5$

C. $+7$

D. -8

Answer: A

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28. Which of the following will produce only one product on reduction with $LiAlH_4$?

A. $CH_3COOC_2H_5$

B. $CH_3COOCH_2CH_2CH_3$

C. $CH_3CH_2COOCH_2CH_3$

D. $CH_3CH_2COOCH_3$

Answer: A

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29. The relative strength of interionic / intermolecular forces in decreasing order is :

A. ion - dipole $>$ dipole - dipole $>$ ion - ion

B. dipole - dipole $>$ ion - dipole $>$ ion - ion

C. ion - ion $>$ ion - dipole $>$ dipole - dipole

D. ion - dipole $>$ ion - ion $>$ dipole - dipole

Answer: C

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30. If 0.5 mol of $BaCl_2$ is mixed with 0.2 mol of Na_3PO_4, the maximum number of moles of $Ba_3(PO_4)_2$ that can be formed is

A. 0.7

B. 0.5

C. 0.03

D. 0.10

Answer: D

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31. If the volume of the vessel in which the reaction $2NO + O_2 \rightarrow 2NO_2$ is occurring is diminished to 1/3 rd of its initial volume . The rate of the reaction will be increased by

A. 5 times

B. 8 times

C. 27 times

D. 35 times

Answer: C

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32. The freezing point of water is depressed by $0.37^{\circ}C$ in a 0.01 molal NaCI solution. The freezing point of 0.02 molal solution of urea is depressed by

A. $0.37^{\circ}C$

B. $0^\circ C$

C. $0.56^\circ C$

D. $0.187^\circ C$

Answer: A

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33. When iodobenzene is treated with sodium in dry ether the product is

A. DDT

B. Triphenyl

C. Diphenyl

D. Dichlorobenzene

Answer: C

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34. The compuond that does no liberate CO_2 on treatment with aqueous sodium bicarbonate solution is :

A. Benzoic acid

B. Benzensulphonic acid

C. Salicylic acid

D. Carbonic acid (Phenol)

Answer: D

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35. The initial rate of hydrolysis of methyl acetate (1M) by a weak acid $(HA, 1M)$ is

$1/100th$ of that of a strong acid $(HX, 1M)$, at $25^\circ C$. The $K_a(HA)$ is

A. 1×10^{-4}

B. 1×10^{-5}

C. 1×10^{-6}

D. 1×10^{-3}

Answer: A

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36. The thermal dissociation equilibrium of $CaCO_3(s)$ is studied under different conditions

$CaCO_3(s) \Leftrightarrow CaO(s) + CO_2(g)$

For this equilibrium, the correct statements are

(i) K is dependent on the pressure of CO_2 at a given T.

(ii) ΔH is dependent on T.

(iii) ΔH is independent of the catalyst, if any.

(iv) K is independent of the initial amount of $CaCO_3$.

A. ΔH is dependent on T

B. K is independent of the initial amount of $CaCO_3$

C. K is dependent on the pressure of CO_2 at a given T

D. ΔH is independent of the catalyst , if any

Answer: C

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37. Which one of the following types of reaction occurs when a peptide link in a protein is broken ?

A. Condensation

B. Substitution

C. Addition

D. Hydrolysis

Answer: D

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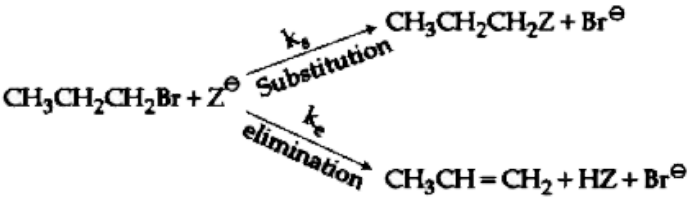
38. For the following reactions



where,

$z^- = CH_3CH_2O^-(A)$ or $H_3C\overset{CH_3}{\underset{CH_3}{C}} - O^-(B)$

k_s and k_e, are, respectively, the rate constants for substitution and elimination, and $\mu = \dfrac{k_s}{k_e}$, the correct option is _____.

A. $\mu_A > \mu_B$ and $k_e(A) > k_e(B)$

B. $\mu_B > \mu_A$ and $k_e(B) > k_e(A)$

C. $\mu_A > \mu_B$ and $k_e(B) > k_e(A)$

D. $\mu_B > \mu_A$ and $k_e(A) > k_e(B)$

Answer: C

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39. The increasing order of the atomic radii of the following elements is :

(a) C (b) O (c) F(d) Cl (e) Br

A. $(b) < (c) < (d) < (a) < (e)$

B. $(d) < (c) < (b) < (a) < (e)$

C. $(c) < (b) < (a) < (d) < (e)$

D. $(a) < (b) < (c) < (d) < (e)$

Answer: C

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40. A tetrapeptide has $-COOH$ group on alanine. This produces glycine (Gly), valine (Val), phenyl alanine (Phe) and alanine (Ala), on complete hydrolyses. For this tetrapeptide, the

number of possible sequences (primary structures) with $-NH_2$ group attached to a chiral centre is

A. 2

B. 3

C. 4

D. 5

Answer: C

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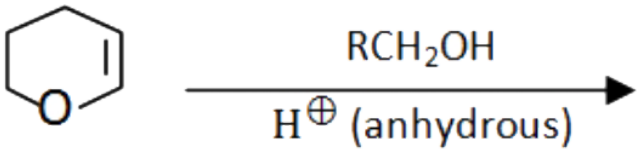
41. The major product of the following reaction is



$$\xrightarrow[H \oplus (\text{anhydrous})]{RCH_2OH}$$

A. An ester

B. An ether

C. An acetal

D. A hemiacetal

Answer: C

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42. $[PdFClBrI]^{2-}$ Number of Geometrical Isomers = n. For $\left[Fe(CN)_6\right]^{n-6}$, Determine the spin only magnetic moment and CFSE (Ignore the pairing energy)

A. 5.92 BM and Δ_0

B. 1.73 BM and - $2.0\Delta_0$

C. 2.84 BM and $-1.6\Delta_0$

D. 0 BM and $-2.4\Delta_0$

Answer: B

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43. The correct match between Item - I and Item - II is

Item I	Item II
(p) High density polythene	(I) Peroxide catalyst
(q) Polyacrylonitrile	(II) Condensation at high temperature and pressure
(r) Novolac	(III) Ziegler-Natta catalyst
(s) Nylon 6	(IV) Acid or base catalyst

A. (p) - (III),(q)-(I),(r)-(II),(s)-(IV)

B. (p) - (IV),(q)-(II),(r)-(I),(s)-(III)

C. (p) - (III),(q)-(IV),(r)-(I),(s)-(III)

D. (p) -(III) ,(q) -(I) ,(r)-(IV),(s) -(II)

Answer: D

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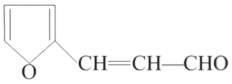
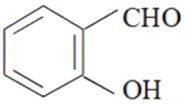
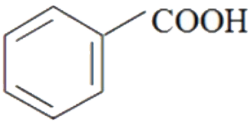
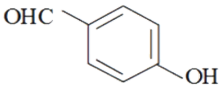
44. An aromatic compound 'A' having molecular formula $C_7H_6O_2$ on treating with aqueous ammonia and heating forms

compounds 'B'. The compound B on reaction with molecular bromine and potassium hydroxide provides compound 'C' having molecular formula C_6H_7N. The structure of 'A' is :

A. 

B. 

C. 

D. 

Answer: C

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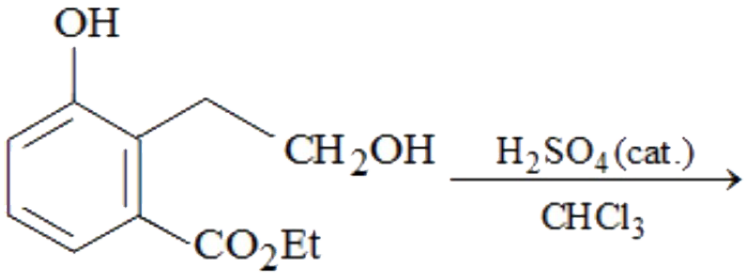
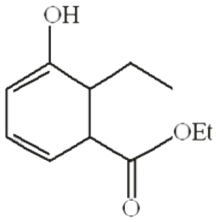
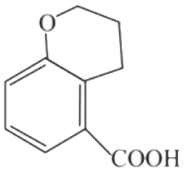
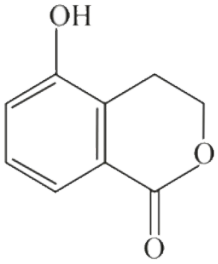
45. The major product of the following reaction is

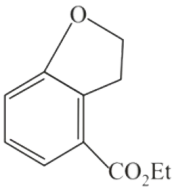


$\xrightarrow[CHCl_3]{H_2SO_4\,(\,cat\,)}$

A. 

B. 

C. 

D. 

Answer: C

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