CHEMISTRY

BOOKS - BITSAT GUIDE

QUESTION-PAPERS-2013

Chemistry

1. For the properties mentioned, the correct trend for the different species is in

A. Strength as Lewis acid

$-BCl_3 > AlCl_3 > GaCl_3$

B. Inert pair effect $-Al > Ga > \ln$

C. Oxidising property

$-Al^{3+} > \ln^{3+} > Ti^{3+}$

D. First ionisaiton enthalpy

$-B > Al > Ti$

Answer: D

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2. Bohr theory is applicable to

A. He

B. Li^{2+}

C. He^{2+}

D. None of these

Answer: B

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3. Using MOT, which of the following pairs denote paramagnetic species?

A. B_2 and C_2

B. B_2 and O_2

C. N_2 and C_2

D. O_2 and O_2^{2-}

Answer: B

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4. $0.1g$ of metal combines with $46.6mL$ of oxygen at STP. The equivalent weight of metal is

A. 12

B. 24

C. 18

D. 36

Answer: A

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5. Which of the following choices represent the correct order of first ionisation enthalpy ?

A. $B < C < N < O < F$

B. $B > C > N > O > F$

C. $B < C < N > O < F$

D. $B < C < N > O > F$

Answer: C

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6. Which of the following reaction produces most stable alkene ?

A. 2-chloro butane

B. 2, 3-dichloro butane

C. 2, 2-dichloro butane

D. 2, 3-dichloro, 2, 3-dimethyl butane

Answer: D

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7. Which of the following is less acidic among the given halogen compounds?

A. CHF_3

B. CHl_3

C. $CHCl_3$

D. $CHBr_3$

Answer: B

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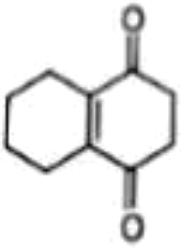
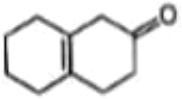
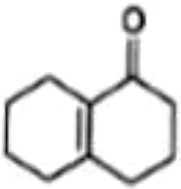
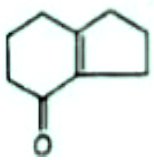
8. What will be the final product of the reaction?

A. 

B. 

C. 

D. 

Answer: D

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9. The vapour pressure of a solvent decreased by 10 mm of Hg when a non-volatile solute was added to the solvent. The mole fraction of solute in solution is 0.2, what would be the mole fraction of solvent if the decrease in vapour pressure is 20 mm of Hg?

A. 0.8

B. 0.6

C. 0.4

D. 0.3

Answer: B

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10. Chose the law that corresponds to data shown for the following reaction, $A + B \rightarrow$

products

Exp.	[A]	[B]	Initial rate
1	0.012	0.035	0.1
2	0.024	0.070	0.8
3	0.024	0.035	0.1
4	0.012	0.070	0.8

A. Rate $= k[B]^3$

B. Rate $= k[B]^4$

C. Rate $= k[A][B]^3$

D. Rate $= k[A]^3[B]$

Answer: A

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11. The magnitude of Δ_0 will be highest in which of the following complex.

A. $[Cr(CN_6)]^{3-}$

B. $\left[Cr(H_2O)_6\right]^{3-}$

C. $\left[Cr(NH_3)_6\right]^{3+}$

D. $\left[Cr(C_2O_4)_3\right]^{3-}$

Answer: A

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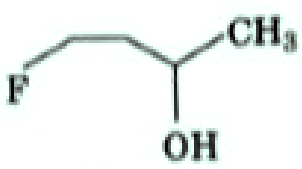
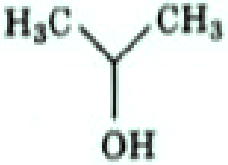
12. Arrange these in correct order of decreasing reactivity.

I



II



III

IV

A. $I > II > III > IV$

B. $I > III > II > IV$

C. $IV > III > II > I$

D. $IV > III > I > II$

Answer: C

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13. When 2-methyl propan-2-ol is treated with a mixture of conc. HCl and $ZnCl_2$, turbidity appears immediately due to the formation of

A. 2-methyl propane

B. 2-methyl propene

C. 2-methyl-2-chloropropane

D. 2-chlorobutane

Answer: C

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14. The pH value of gasfric juice in humna stomach is about 1.8 and in intiestine , it is about 7.8. The pk_a value of aspirin is 3.5 Aspirin will be

A. Ionised in the small intestine and stom

B. Ionised in the stomach and almost unionized in the small intestine

C. Unionised in small intestine and stomach

D. Completely ionized in small intestine and stomach

Answer: A

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15. What would happen when a solution of potassium chromate is treated with an excess of dilute nitric acid ?

A. Cr^{3+} and $Cr_2O_7^{2-}$ are formed

B. $Cr_2O_7^{2-}$ and H_2O are formed

C. CrO_4^{2-} rduced to Cr^{3+}

D. CrO_4^{2-} oxidized to $Cr_2O_7^{2-}$ only

Answer: B

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16. Calcium carbide reacts with heavy water to form

A. C_2D_2

B. CaD_2

C. CaD_2O

D. CD_2

Answer: A

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17. Fluorine acts as strongest oxidizing agent because of its high

A. Electron affinity

B. Ionisation enthalpy

C. Hydration enthalpy

D. Bond enthalpy

Answer: C

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18. The reaction of P_4 with X leads selectively to P_4O_6 The X is :

A. dry O_2

B. moist O_2

C. mixture of O_2 and N_2

D. O_2 in presence of aquece NaOH

Answer: C

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19. The acidic strength for the hydrides of group 15 follows the order

A. $NH_3 < PH_3 < AsH_3 < SbH_3$

B. $NH_3 > PH_3 > AsH_3 > SbH_3$

C. $NH_3 > PH_3 > SbH_3 > AsH_3$

D. $NH_3 < PH_3 < AbH_3 < AsH_3$

Answer: B

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20. Which of the following staments are incorrect in context of borax?

A. It is made up to two triangular BO_3 units and two tetrahedral BO_4 units

B. One mole of borax can be used as buffer

C. It is a useful primary standard for titrating against acids

D. Aqueous solution of borax can be used as buffer

Answer: B

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21. Salt $A + S \rightarrow B \xrightarrow{BaCl_2}$ White precipitate A is paramagnetic in nature and contains about 55% K. Thus, A is

A. K_2O

B. K_2O_2

C. KO_2

D. K_2SO_4

Answer: C

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22. equal volume each of two sols of AgI, one obtained by adding $AgNO_3$ to slight excess of KI and another obtained by adding KI to slight excess of $AgNO_3$ are mixed together . Then :

A. The sol particles acquired more electric charge

B. The sols coagulated each other mutually

C. A true solution is obtained

D. The two sols stabilized each other

Answer: B

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23. In the extraction of Ag, Zn is removed from (Zn-Ag) alloy through

A. Cupellation

B. Fractional crystallization

C. Distillation

D. Electrolytic refining

Answer: D

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24. A reaction takes place in three steps. The rate constant are k_1, k_2 and k_3. The overall rate constant $k = \frac{k_1 k_3}{k_2}$. If E_1, E_2 and E_3 (energy of activation) are 60, 30 and 10 kJ, respectively, the overall energy. Of activation is

A. 40

B. 30

C. 400

D. 300

Answer: A

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25. If $E^{\circ}_{Fe^{3+}/Fe}$ and $E^{\circ}_{Fe^{2+}/Fe}$ are $-0.36V$ and $0.439V$ respectively, then value of $E^{\circ}_{Fe^{3+}/Fe^{2+}}$ is

A. $(-0.036-0.439)V$

B. $[3(-0.36)+2(-0.439)]V$

C. $(-0.36-0.439)V$

D. $[3(0.36)-2(-0.439)]V$

Answer: D

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26. KCl crystallises in the same type of lattice as does NaCl Given that $r_{Na^+}/r_{Cl^-}=0.55$

and $r_{K^+}/r_{Cl^-} = 0.74$, the ratio of the side of unit cell for KCl to that of NaCl is

A. 0.124

B. 1.123

C. 0.891

D. 1.414

Answer: B

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27. The compound formed as a result of oxidation of propyl benzene by $KMnO_4$ is

A. Benzaldehye

B. Benzyl alcohol

C. Benzoic acid

D. Acetophenone

Answer: C

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28. Which of the following is an outer d-orbital or high spin complex ?

A. $\left[Co(NH_3)_6\right]^{3+}$

B. $\left[Ni(CN)_4\right]^{2-}$

C. $\left[NiCl_4\right]^{2-}$

D. $\left[CoF_6\right]^{3-}$

Answer: D

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29. The monosaccharide having anomeric carbon atoms are

A. Geometrical isomers

B. $\alpha -$ and $\beta -$ optical isomers

C. Having symmetrical carbon atoms

D. None of the above

Answer: B

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30. Primary amine is not formed in the reaction of

I. hydrolysis of RCN

II. reduction of RCH = NOH

III. hydrolysis of RNC

IV. hydrolysis of $RCONH_2$

The correct answer is

A. I, II and IV

B. I and IV

C. II and III

D. I, II and III

Answer: B

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31. In vulcanization of rubber:

A. Sulphur reacts to form a new compound

B. Sulphur cross links are introduced

C. Sulphur form a very thin protective layer on rubber

D. All of the above

Answer: B

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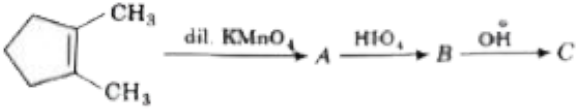
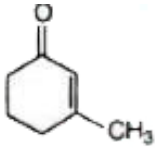
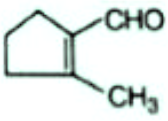
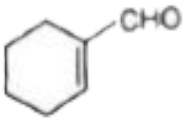
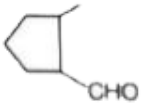
32. What will be the correct structural formula of product for the following reaction?



A. 

B. 

C. 

D. 

Answer: A

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33. What will be the correct relation between products when 2-methyl cyclohexene is treated with (i) B_2H_6 in the presence of

H_2O_2/OH^- and (ii) H_2O/H_2SO_4 ?

(Also consider stereochemistry of product)

A. They are metamers

B. They are tautomers

C. They are functional isomer

D. They are positional isomer

Answer: D

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34. The equilibrium constant K_p, for the reaction $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$ is 1.6×10^{-4} at $400^\circ C$. What will be the equilibrium constant at $500^\circ C$ if the heat of reaction in this temperature range is -25.14 kcal?

A. $1.231 \times 10^{-4}(\text{atm})^{-2}$

B. $1.876 \times 10^{7}(\text{atm})^{-2}$

C. $1.462 \times 10^{-5}(\text{atm})^{-2}$

D. $3.462 \times 10^{-5}(\text{atm})^{-2}$

Answer: C

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35. At $27^\circ C$, K_p value for the reaction $CaCO_3(s) \Leftrightarrow CaO(s) + CO_2(g)$, is 0.1 atm. K_C value for this reaction is

A. 4×10^{-3}

B. 6×10^{-3}

C. 2×10^{-3}

D. 9×10^{-3}

Answer: A

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36. At constant T and P, Which of the following statements is correct for the reaction,

$$CO(G) + \frac{1}{2}O_2(g) \rightarrow CO_2(g),$$

A. $\Delta H = \Delta E$

B. $\Delta H < \Delta E$

C. $\Delta H > \Delta E$

D. ΔH is independent of physical state of reactant

Answer: B

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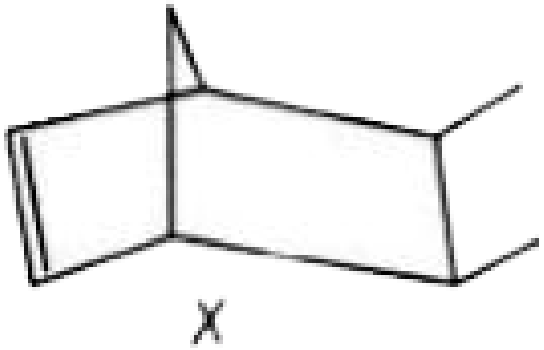
37. IUPAC name and degree of unsaturation of compound X is



X

A. 2, 3-dimethyl bicyclo [2, 2, 1] hept-5 ene, 2

B. 1, 2-dimethyl bicyclo [2, 2, 1] hept-4 ene, 3

C. 5, 6-dimethyl bicyclo [2, 2, 1] hept-2 ene, 3

D. 4, 5-dimethyl bicycle [2, 2, 1] hept-1 ene, 2

Answer: C

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38. The average oxidation state of sulphur in $Na_2S_4O_6$ is

A. $+6$

B. $+\frac{3}{2}$

C. $+\frac{5}{2}$

D. -2

Answer: C

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39. Which of the following antibiotics contain nitro group attached to aromatic in its structure?

A. Tetracyclin

B. Penicillin

C. Streptomycin

D. Chloramphenicol

Answer: D

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40. The behavior of the gas becomes more ideal at

I. Very low pressure

II. Value of Z is unity

III. Very high pressure

IV. Value of Z is greater than one

Choose the correct option.

A. I and II are correct

B. I and IV are correct

C. I and III are correct

D. III and IV are correct

Answer: A

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