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CHEMISTRY

BOOKS - BITSAT GUIDE

QUESTION-PAPERS-2018

Chemistry

1. The 25 mL of a 0.15 M solution of lead nitrate, $Pb(NO_3)_2$ react with all of the aluminium sulphate , $Al_2(SO_4)_3$, present in 200 mL of a solution . What is the molar concentration of the $Al_2(SO_4)_3$, present in 20 mL of a solution . What is the molar concentration of the $Al_2(SO_4)_3$?

A. $6.25 \times 10^{-2} M$

B. $2.421 \times 10^{-2} M$

C. $0.1875 M$

D. None of these

Answer: A

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2. 100 mL O_2 and H_2 kept at same temperature and pressure. What is true about their number of molecules?

A. $NO_2 > NH_2$

B. $NO_2 < NH_2$

C. $NO_2 = NH_2$

D. $NO_2^+ + NH_2 = 1$ mole

Answer: C

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3. If the Planck's constant $h = 6.6 \times 10^{-34} Js$, the de Broglie wavelength of a particle having momentum of $3.3 \times 10^{-24} kgms^{-1}$ will be

A. 0.002Å

B. 0.5Å

C. 2Å

D. 500Å

Answer: C

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4. A mongst the elements with following electronic configurations, which one of them may have the highest ionization energy?

A. $[Ne]3s^2 3p^2$

B. $[Ar]3d^{10}4s^2 4p^3$

C. $[Ne]3s^2 3p^1$

D. $[Ne]3s^2 3p^3$

Answer: D

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5. Which of the following is the correct and increasing order of lone pair of electrons on the central atom?

A. $IF_7, < IF_5 < CIF_3 < XeF_2$

B. $IF_7 < XeF_2 < CIF_2 < IF_5$

C. $IF_7 < CIF_3 < XeF_2 < IF_5$

D. $IF_7 < XeF_2 < IF_5 < CIF_3$

Answer: A

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6. According to molecular orbital theory, which of the following statement about the magnetic character and bond order is correct reagarding O_2^+ ?

A. Paramagnetic and Bond order $< O_2$

B. Paramagnetic and Bond order $> O_2$

C. Diamagnetic and Bond order $< O_2$

D. Diamagnetic and Bond order $> O_2$

Answer: B

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7. If v is the volume of one molecule of a gas under given conditions, then van der Waals constant b is

A. 4V

B. $\frac{4V}{N_0}$

C. $\frac{N_0}{4V}$

D. $4VN_0$

Answer: D

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8. For vaporization of water at 1 atmospheric pressure, the values of ΔH and ΔS are 40.63kJ mol^{-1} and $108.8\text{JK}^{-1}mol^{-1}$ respectively. The temperature when Gibbs energy change (ΔG) for this transformation will be zero , is :

A. 293.4 K

B. 273.4 K

C. 393.4 K

D. 373.4 K

Answer: D

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9. For the reaction taking place at certain temperature $NH_2COONH_4(s) \Leftrightarrow 2NH_3(g) + CO_2(g)$ if equilibrium pressure is 3 X bar then $\Delta_r G^\circ$ would be

A. – RT ln 9 – 3RT ln X

B. RT ln 4 – 3RT ln X

C. – 3RT ln X

D. None of these

Answer: D

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10. The pH of 0.1 M solution of the following salts increases in the order

A. $NaCl < NH_4Cl < NaCN < HCl$

B. $HCl < NH_4Cl < NaCl < NaCN$

C. $NaCN < NH_4Cl < NaCl < HCl$

D. $HCl < NaCl < NaCN < NH_4Cl$

Answer: B

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11. When N_2O_5 is heated at certain temperature, it dissociates as $N_2O_5(g) \Leftrightarrow N_2O_3(g) + O_2(g), K_c = 2.5$ At the same time N_2O_3 also decomposes as :

$N_2O_3(g) \Leftrightarrow N_2)(g) + O_2(g)$. "If initially" 4.0 moles of N_2O_5 "are taken in" 1.0 litre flask and alowed to dissociate.

Concentration of O_2 at equilibrium is 2.5 M. "Equilibrium concentratio of " N_2O_5 is :

A. 1.0 M

B. 1.5 M

C. 2.166 M

D. 1.846 M

Answer: D

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12. Cosider the reactions

(i) $H_2O_2 + 2HI \rightarrow I_2 + 2H_2O$

(ii) $HOCl + H_2O_2 \rightarrow H_3O^+ + Cl^- + O_2$

Which of the following statements is correct about H_2O_2 with reference to these reactions ? Hydrogen peroxide is â€¦â€¦â€¦

A. an oxidising agent in both (A) and (B)

B. an oxidising agent in (A) and reducing agent in (B)

C. a reducing agent in (A) and oxidising agent in (B)

D. a reducing agent in both (A) and (B)

Answer: B

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13. Following are colours shown by some alkaline earth metals in flame test. Which of the following are not correctly

matched?

	Metal	Colour
(i)	Calcium	Apple green
(ii)	Strontium	Crimson
(iii)	Barium	Brick red

A. (i) and (iii)

B. (i) only

C. (ii) only

D. (ii) and (iii)

Answer: A

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14. Beryllium shows diagonal relationship with aluminum . Which of the following similarity is incorrect?

A. Be forms beryllates and Al forms aluminates

B. Be $(OH)_2$ like $Al(OH)_3$ is basic

C. Be like Al is rendered passive by HNO_3.

D. Be_2C like Al_4C_3 yields methane on hydrolysis

Answer: B

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15. An element X occurs in short period having configuration ns^2np^1. The formula and nature of its oxide is:

A. XO_3, basic

B. XO_3, acidic

C. X_2O_3, amphoteric

D. X_2O_3, basic

Answer: C

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16. Which of the following is strongest nucleophile

A. Br^-

B. $:OH^-$

C. CN^-

D. $C_2H_5\overline{O}:$

Answer: C

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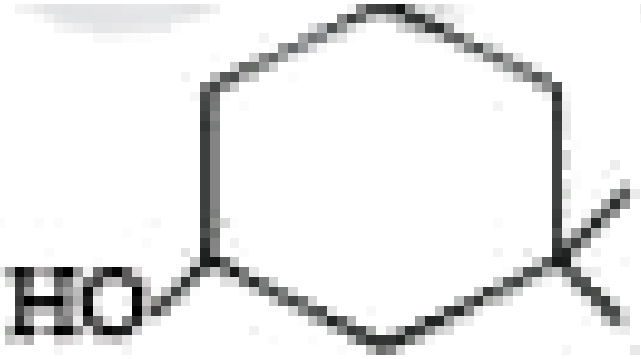
17. The IUPAC name of the compound is



A. 3, 3-dimethyl - 1- cyclohexanol

B. 1, 1-dimethyl-3-hydroxy cyclohexane

C. 3, 3-dimethyl-1-hydroxy cyclohexane

D. 1, 1-dimethyl-3-cyclohexanol

Answer: A

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18. Which of the following will have a meso-isomer also ?

A. 2, 3- Dichloropentane

B. 2, 3-Dichlorobutane

C. 2-Chlorobutane

D. 2-Hydroxypropanoic acid

Answer: B

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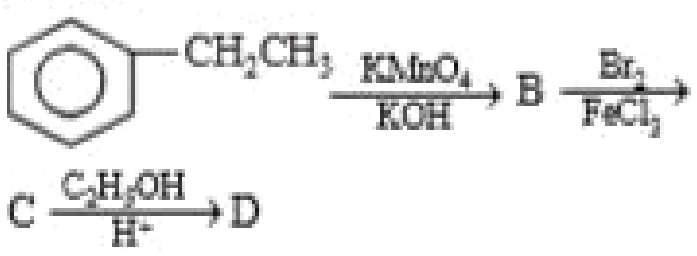
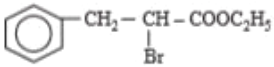
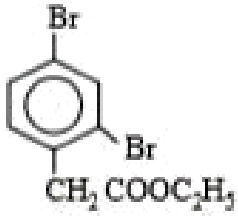
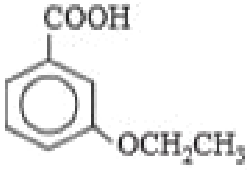
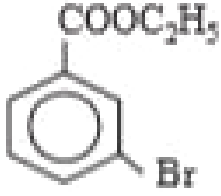
19. In a set of reactions, ethylbenzene yielded a product D.



A. 

B. 

C. 

D. 

Answer: D

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20. Identify the incorrect statement from the following:

A. Ozone absorbs the intense ultraviolet radiation of the sun.

B. Depletion of ozone layer is because of its chemical reactions with chlorofluoro alkanes.

C. Ozone absorbs infrared radiation

D. Oxides of nitrogen in the atmosphere can cause the depletion of ozone layer.

Answer: C

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21. Each edge of a cubic unit cell is 400pm long. If atomic mass of the elements is 120 and its desity is $6.25g/cm^2$, the crystal lattice is: $(useN_A = 6 \times 10^{23})$

A. primitive

B. body centered

C. face centered

D. end centered

Answer: B

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22. Choroform , $CHCl_3$, boils at 61.7°C. If the K_b for choroform is $3.63^\circ C/\text{molal}$, what is the boiling point of a solution of 15.0 kg ofCH_3 and 0.616 kg of acenaphthalene, $C_{12}H_{10}$?

A. 61.9

B. 62.0

C. 52.2

D. 62.67

Answer: D

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23. pH of a $0.1M$monobasic acid is found to be 2,Hence its osmotic pressure at a given temp.TK is-

A. 0.1 RT

B. 0.11 RT

C. 1.1 RT

D. 0.01 RT

Answer: B

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24. On passing electric current of one ampere for 16 min and 5 sec through one litre solution of $CuCl_2$, all copper of solution was deposited at cathode. The normality of $CuCl_2$ solution was:

A. 0.01 N

B. 0.01 M

C. 0.02 M

D. 0.2 N

Answer: A

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25. A 100.0mL dilute solution of Ag^+ is electrolysed for 15.0 minutes with a current of 1.25mA and the silver is removed completely. What was the initial $[Ag^+]$?

A. 2.32×10^{-1}

B. 2.32×10^{-4}

C. 2.32×10^{-3}

D. 1.16×10^{-5}

Answer: D

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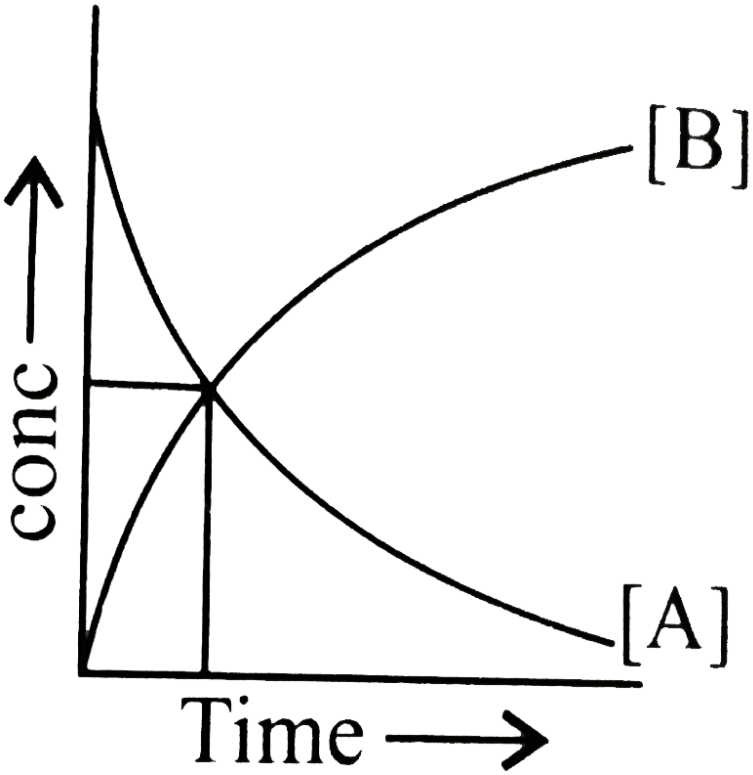
26. The accompanying figure depicts a change in concentration of species A and B for the reaction $A \rightarrow B$, as a function of time. The point of inter section of the two curves

represents



A. $t_{1/2}$

B. $t_{3/4}$

C. $t_{2/3}$

D. Data insufficient to predict

Answer: A

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27. The rate constant of a reactant is 1.5×10^{-3} at $25^{\circ} C$ and 2.1×10^{-2} at $60^{\circ} C$. The activation energy is

A. $\frac{35}{333} R \frac{\log_e (2.1 \times 10^{-2})}{1.5 \times 10^{-2}}$

B. $\frac{298 \times 333}{35} R \frac{\log_e (21)}{15}$

C. $\frac{298 \times 333}{35} R \log_e 2.1$

D. $\frac{298 \times 333}{35} R \frac{\log_e (2.1)}{1.5}$

Answer: B

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28. Freundlich equation for adsorption of gases (in amount of Xg) on a solid (in amount od mg) at constant temperature can be expressed as

A. $\frac{\log(x)}{m} = \log p + \frac{1}{n}\log K$

B. $\frac{\log(x)}{m} = \log K + \frac{1}{n}\log p$

C. $\frac{x}{m} \propto p^n$

D. $\frac{x}{m} = \log p + \frac{1}{n}\log K$

Answer: B

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29. Which of the following feature of catalysts is described in reactions given below?

(i) $CO(g) + 2H_2(g) \xrightarrow{Cu\,/\,ZnO - Cr_2O_3} CH_3OH(g)$

(ii) $CO(g) + H_2(g) \xrightarrow{Cu} HCHO(g)$

(iii) $CO(g) + 3H_2(g) \xrightarrow{Ni} CH_4(g) + H_2O(g)$

A. Activity

B. Selectivity

C. Catalytic promoter

D. Catalytic poison

Answer: B

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30. Which of the following is not a member of chalcogens?

A. O

B. S

C. Se

D. Po

Answer: D

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31. Pick out the wrong statement.

A. Nitrogen has the ability to form $p\pi - p\pi$ bonds with itself

B. Bismuth forms metallic bonds in elemental state

C. Catenation tendency is higher in nitrogen when compared with other elements of the same group.

D. Nitrogen has higher first ionisation enthalpy when compared with other elements of the same group.

Answer: C

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32. Which of the following element do not form complex with EDTA?

A. Ca

B. Mg

C. Be

D. Sr

Answer: C

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33. Which one of the cyano complexes would exhibit the lowest value of para magnetic behaviour ?

(At. No. Cr = 24, Mn = 25, Fe = 26, Co = 27)

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

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

C. $\left[Mn(CN)_6\right]^{3-}$

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

Answer: A

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34. When an aqueous solution of copper (II) sulphate is saturated with ammonia, the blue compound crystallises on evaporation. The formula of this blue compound is:

A. $\left[Cu(NH_3)_4\right]SO_4.\ H_2O$ (square planar)

B. $\left[Cu(NH_3)_4\right]SO_4$ (Tetrahedral)

C. $\left[Cu(NH_3)_6\right]SO_4$ (Octahedral)

D. $\left[Cu(SO_4)(NH_3)_5\right]$ (Octahedral)

Answer: A

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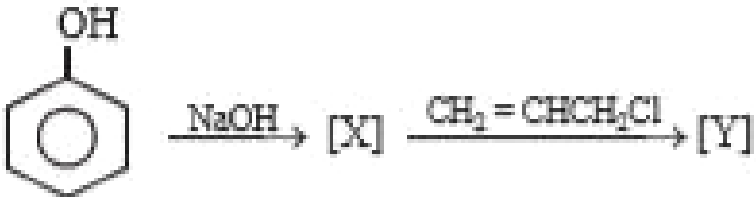
35. 

Here [Y] is a

A. single compound

B. mixture of two compounds

C. mixture of three compounds

D. no reaction is possible

Answer: C

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36. Following compounds are given

1.CH_3CH_2OH

2. CH_3COCH_3

3.$CH_3 - \underset{\underset{CH_3}{|}}{C}\ HOH$

4.CH_3OH

Which of the above compound (s) on,being warmed with iodine solution and NaOH, will give iodoform

A. (1) and (2)

B. (1), (3) and (4)

C. only (2)

D. (1), (2) and (3)

Answer: D

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37. Arrange the following alcohols in increasing order of their reactivity towards the reaction with HCl

$(CH_3)_2CH - OH(1), (CH_3)_3C - OH(2), (C_6H_5)_3C - OH(3)$

A. $1 < 2 < 3$

B. $2 < 1 < 3$

C. $3 < 1 < 2$

D. $2 < 3 < 1$

Answer: A

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38. Thirty percent of the bases in a sample of DNA extracted from eukaryotic cells is adenine. What percentage of cytosine

is present in this DNA?

A. $10\ \%$

B. $20\ \%$

C. $30\ \%$

D. $40\ \%$

Answer: B

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39. The blue colour of snail is due to presence o

A. Albumin

B. Haemocyanin

C. Globulins

D. Fibrinogen

Answer: B

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40. Which of the following is a diamine?

A. Dopamine

B. Histamine

C. Meprobamate

D. Chlorphenamine

Answer: C

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