CHEMISTRY

BOOKS - BITSAT GUIDE

SOLVED PAPER 2019 BITSAT

Part Ii Chemistry

1. In a compound, atoms of elementsY form ccp lattice and those of element X occupy 2/3 rd of tetrahedral voids. The formula of the compound can be

A. X_4Y_3

B. X_2Y_3

C. X_2Y

D. X_2Y_4

Answer: A

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2. If density of a certain gas at $30^\circ C$ and 768 Torr is $1.35kg/m^3$, then density at STP is

A. $1.48kg/m^3$

B. $1.27kg/m^3$

C. $1.35kg/m^3$

D. $1.00 kg / m^3$

Answer: C

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3. For an octahedral complex, which of the following d electron configuration will give maximum crystal-field stabilisation energy?

A. high spin, d^6

B. low spin d^4

C. low spin d^5

D. high spind^7

Answer: B

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4. The wavelength of high energy transition of H atoms is $91.2nm$ Calculate the corresponding wavelength of He atom.

A. 2.28 nm

B. 22.8 nm

C. 182.4 nm

D. 364.8 nm

Answer: B

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5. The heat of reaction for, $C_{10}H_8 + 12O_{2(g)} \rightarrow 10CO_{2(g)} + 4H_2O_{(l)}$ at constant volume is $-1228.2kcal$ at $25^\circ C$. Calculate the heat of reaction at constant pressure at $25^\circ C$.

A. -1228.2 kcal

B. -1229.3 kcal

C. -1232.9 kcal

D. -1242.6 kcal

Answer: A

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6. Given the hypothetical reaction mechanism

$A \xrightarrow{I} B \xrightarrow{II} C \xrightarrow{III} D \xrightarrow{IV} E$ and the rate as

Species formed	Rate of its formation
B	0.002 mol/h per mole of *A*
C	0.030 mol/h per mole of *B*
D	0.011 mol/h per mole of *C*
E	0.420 mol/h per mole of *D*

E and the rate as The rate determining step is

A. step I

B. step II

C. step III

D. step IV

Answer: D

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7. $C_6H_5NH_2 \xrightarrow[180^\circ C]{H_2SO_4} \underset{\text{Para form}}{NH_2C_6H_4(SO_3H)}$

The true statement about the product is

A. it does not exist as Zwitter ion

B. $-NH_2$ group displays a powerful basic character

C. it does not act as inner salt

D. $-SO_3$ H , diminishes the basic character of $-NH_2$

Answer: C

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8. The hybridisation of phosphorous in PO_4^{3-} is

A. sp

B. sp^2

C. sp^3

D. sp^3 d

Answer: C

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9. Which of the following lanthanoid ions is diamagnetic ?

(At nos . `Ce = 58 , Sm = 62, Eu = 63 , Yb =70)

A. Sm^{2+}

B. Eu^{2+}

C. Yb^{2+}

D. Ce^{2+}

Answer: B

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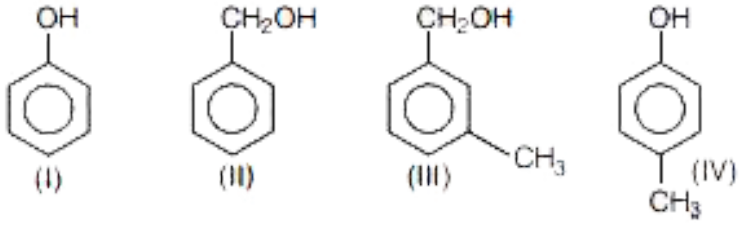
10. Which of the following is/are aromatic alcohol?



A. I,II,III,IV

B. II and III

C. I and IV

D. Only I

Answer: B

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11. Among the following substituted silanes, the one which will give rise to cross linked silicone polymer on hydrolysis is?

A. R_4 Si

B. R $SiCI_3$

C. R_2 SiCl

D. R_3 SiCl

Answer: B

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12. The chemical reaction $2O_3 \rightarrow 3O_2$ proceeds as follows :

$O_3 \rightarrow O_2O$ (fast)

$O + O_3 \rightarrow 2O_2$ (slow)

The rate law expression should be :

A. $r = k[O_3]^2[O_2]^{-1}$

B. $r = k[O_3]^2$

C. $r = k[O_3][O_2]$

D. unpridicatable

Answer: A

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13. An aqueous solution freezes at 272.4 K, while pure water freezes at 273 K, given Kf = 1.86 K kg mol^{-1}, and $K_b = 0.512$ - k kg mol^{-1}, the molality of solution and boiling point of solution respectively will be–

A. 0.322 and 373.16 K

B. 0.222 and 273.15 K

C. 0.413 and 400 K

D. 0.5 and 300.73 K

Answer: A

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14. The order of acidic strenght boron trihalides is:

A. $BF_3 < BCl_3 < BBr_3 < BI_3$

B. $BI_3 < BBr_3 < BCl_3 < BF_3$

C. $BCl_3 < BBr_3 < BI_3 < BF_3$

D. $BBr_3 < BCl_3 < BF_3 < BI_3$

Answer: A

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15. The correct order of mobility of alkali metal ions in aqueous solution is

A. $Li^+ > Na^+ > K^+ > Rb^+$

B. $Na^+ > K^+ > Rb^+ > Li^+$

C. $k^+ > Rb^+ > Na^+ > Li^+$

D. $Rb^+ > K^+ > Na^+ > Ki^+$

Answer: D

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16. Thermosetting polymer, Bakeline is formed by the reaction of phenol with

A. $CH_3.CH_2.CHO$

B. $CH_3.CHO$

C. $H.CHO$

D. HCOOH

Answer: C

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17. A drug that is antipyretic as well as analgesic is :

A. chloroquine

B. penicillin

C. paracetamol

D. chloropromazine hydrochloride

Answer: C

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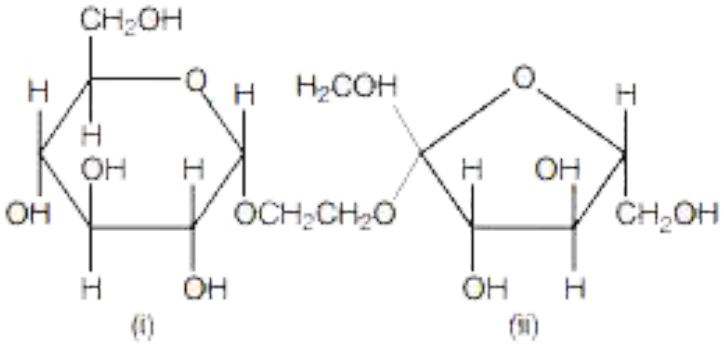
18. The correct statement about the following disaccharide is–



A. Ring (I) is pyranose with α -glycosidic link

B. Ring (I) is furanose with α -glycosidic link

C. Ring (II) is furanose with α-glycosidic link

D. Ring (II) is pyranose with α -glycosidic link

Answer: A

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19. If one strand of DNA has the sequence ATCGTATG , the sequence in the complementary strand would be

A. TAGCTTAC

B. TCACATAC

C. TAGCATAC

D. TACGATAC

Answer: C

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20. Which of the following salt would give SO_2 with hot and dil. H_2SO_4 and also decolourise Br_2 water?

A. Na_2SO_3

B. $NaHSO_4$

C. Na_2SO_4

D. Na_2S

Answer: A

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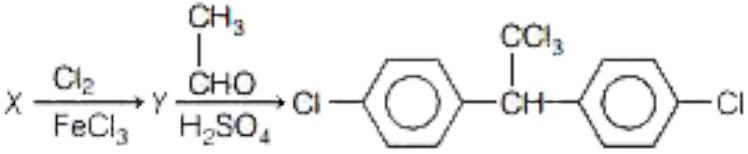
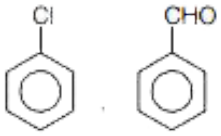
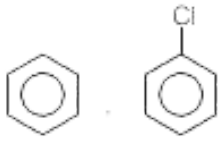
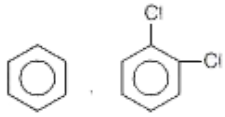
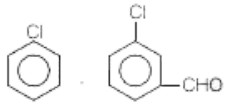
21. In the reaction (X) and (Y) are respectively.



A. 

B. 

C. 

D. 

Answer: B

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22. Which of the following reaction is an example of use of water gas in the synthesis of other compounds ?

A. $CH_4(g) + H_2O(g) \xrightarrow[Ni]{1270K} CO(g) + H_2(g)$

B. $CO(g) + H_2O(g) \xrightarrow[\text{Catalyst}]{673K} CO_2(g) + H_2(g)$

C.

$$C_nH_{2n+2} + n.\ H_2O(g) \xrightarrow[Ni]{1270K} n.\ CO + (2n+1)H_2$$

D. $CO(g) + 2H_2(g) \xrightarrow[\text{Catalyst}]{\text{Cobalt}} CH_3.OH(I)$

Answer: D

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23. Which of the following compounds, on reaction with NaOH and Na_2O_2 gives yellow colour?

A. $Zn(OH)_2$

B. $AI(OH)_3$

C. $Cr(OH)_3$

D. $CaCO_3$

Answer: C

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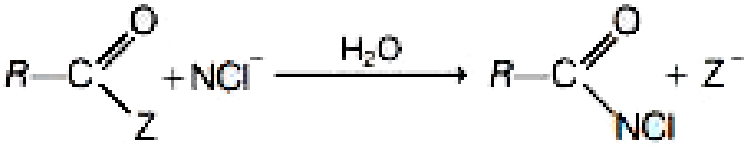
24. For the reaction–



rate of reaction is faster, when Z is–

A. Cl

B. NH_2

C. OC_2H_5

D. $OCOCH_3$

Answer: A

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25. E_1, E_2 and E_3 are the emfs of the following three galvanic cells respectively

I. $Zn((s))|Zn^{2+}(0.1M)|\,|CU^{2+}(1M)|\,Cu((s))$

II. $Zn((s))ZN^{2+}(1M)\,||Cu^{2+}(1M)|Cu(s)$

III. $Zn(s)\mid Zn^{2+}(1M)||CU^{2+}(0.1M)CU(s)$

A. $E_2 > E_1E_3$

B. $E_1 > E_2 > E_3$

C. $E_3 > E_1 > E_2$

D. $E_3 > E_2 > E_1$

Answer: B

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26. Sodium nitroprusside when added to an alkaline solution of sulphide ions produces

A. red colouration

B. blue colouration

C. purple colouration

D. brown colouration

Answer: C

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27. For a reverse reaction, $A \rightarrow B$, which one of the following statement is wrong from the given energy. Profile diagram?

A. Activation energy of forward reaction is greater than backward reaction

B. The forward reaction is endothermic

C. The threshold energy is less than that of activation energy

D. The energy of activation of forward reaction is equal to the sum of heat of reaction and the

energy of activation of backward reaction

Answer: C

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28. Which of the following reactants is used for the preparation of ethyl benzene, where anhyd. $AlCl_3$ is a catalyst?

A. $CH_3.CH_2OH + C_6H_6$

B. $CH_3 - CH = CH_2 + C_6H_6$

C. $H_2C = CH_2 + C_6H_6$

D. $CH_3 - CH_3 + C_6H_6$

Answer: C

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29. Given pH of a solution A is 3 and it is mixed with another solution B having pH 2. If both mixed then resultant pH of the solution will be

A. 3.2

B. 1.9

C. 3.4

D. 3.5

Answer: B

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30. In freundlich adsorption isotherm, the value of 1/n is :

A. between 0 and 1 in all cases

B. between 2 and 4 in all cases

C. always 1 in case of physical adsorption

D. always 1 in use of chemical adsorption

Answer: A

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31. The spin only magnetic moment of Mn^{4+} ion is nearly

A. 3 BM

B. 6 BM

C. 3 BM

D. 5BM

Answer: C

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32. 0.45 gm of an acid with molecular mass 90 g/mole is neutralized by 20 ml of 0.5 N caustic potash. The basicity

of the acid is :

A. 2

B. 4

C. 1

D. 3

Answer: A

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33. 4 moles of A are mixed with 4 moles of B. At equilibrium for the raction $A + B \Leftrightarrow C + D$, 2 moles of C and D are formed. The equilibrium constant for the reaction will be

A. 1

B. $1/2$

C. 4

D. $1/4$

Answer: A

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34. What is the time (in sec) required for depositing all the silver present in $125mL$ of $1MAgNO_3$ solution by passing a current of $241.25A$? $(1F = 96500C)$

A. 10

B. 50

C. 100

D. 1000

Answer: B

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35. In a homonuclear molecule which of the following set of orbitals are degenerate ?

A. $\sigma 1s$ and $\sigma 2s$

B. πp_x and $\pi 2p_y$

C. $\pi 2p_x$ and $\sigma 2p_z$

D. $\sigma 2p_x$ and $\sigma 2p_z$

Answer: B

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36. If the photon of the wavelength $150pm$ strikes an atom and one of its inner bound electrons is ejected out with a velocity of $1.5 \times 10^7 ms^{-1}$, calculate the energy with which it is bound to the nucleus.

A. $1.2 \times 10^2 eV$

B. 2.15×10^3 eV

C. 7.6×10^3 eV

D. 8.12×10^3 eV

Answer: C

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37. The compound C_7H_8 undergoes the following reactions :

$$C_7H_8 \xrightarrow{3Cl_2/\Delta} A \xrightarrow{Br_2/Fe} B \xrightarrow{Zn/HCl} C$$

The product 'C' is

A. o-bromotoluene

B. m-bromotoluene

C. p-bromotoluene

D. 3-bromo, 2, 4, 6 trichlorotoluene

Answer: B

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38. In a compound C, H, N atoms are present in $9:1:3.5$ by weight. Molecular weight of compound is 108 . Its molecular formula is:

A. $C_2H_6N_2$

B. C_3H_4N

C. $C_6H_8N_2$

D. $C_9H_{12}N_3$

Answer: C

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39. Which of the following compounds contain all the carbon atoms in the same hybridisation state ?

A. $H - C \equiv C - C \equiv C - H$

B. $CH_3 - C \equiv C - CH_3$

C. $CH_2 = C = CH_2$

D. $CH_2 = CH - C \equiv CH$

Answer: A

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40. The final step for the extraction of copper from copper pyrite in Bessemer converter involves the reaction

A. $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$

B. $4Cu_2O + FeS \rightarrow 8Cu + FeSO_4$

C. $2Cu_2O + FeS \rightarrow 4Cu + Fe + SO_2$

D. $Cu_2S + 2FeO \rightarrow 2Cu + Fe + SO_2$

Answer: A

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