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CHEMISTRY

BOOKS - CHHAYA CHEMISTRY (BENGALI ENGLISH)

PREVIOUS YEARS QUESTION PAPER 2018

Wbchse 2018 Part A

1. At a constant pressure, the solubility of a gas in a liquid solvent changes when temperature is increased : State what changes occurs and explain why it happens.

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2. The particles of a true solution can pass through a semi-permeable membrane , but those of a colloidal solution cannot. Explain why.

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3. What is chemisorption? Explain with an example.

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4. Write with balanced chemical equation , what happens when chlorine gas is passed into aqueous solution of sulphur dioxide.

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5. Write with balanced chemical equation , what happens when white phosphorus is boiled with caustic soda solution.

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6. How many isomers are possible for $\left[Co(NH_3)_4Cl_2\right]Cl$? Draw their structures.

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7. What is condensation polymerisation ? Write with an example.

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8. How may octahedral voids are present in 1 mole of a compound having cubic close packed structure ?

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9. What is a p-type semiconductor?

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10. A cubic crystal is made up of elements A and B. B is located at the corners of the units cell and A is at the body centre. What will be the probable formula of the compound ?

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11. The concentration of a solution is 0.4 M . What does it mean ?

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12. How many gram of glucose when dissolved in 2 litre of water will be isotonic with blood at $37^{\circ} C$?

[$\pi_{bl \infty d} = 7.65 atm$, Molar mass of glucose = $180 gmol^{-1}$, $R = 0.082 L. Atm. K^{-1}.$ mol]

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13. In which of the following two compounds S_N2 reaction is faster ? Give reason.

$CH_3CH_2CH_2Cl$ and $CH_3CH_2CH_2I$

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14. How would you distingiush between the following pair of compounds by a chemical reaction ?

$CH_3 - \underset{\underset{OH}{|}}{C}H - CH_3$ and $CH_3 - CH_2 - CH_2 - OH$

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15. Write down the products of the following reaction :

$CH_3OCH_2CH_3 \xrightarrow[Heat]{conc.HI}$

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16. Primary structure of protein is due to

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17. What is meant by activation energy of a reaction ?

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18. Show that the time required to complete 99% of a 1st order reaction is twice than that of time required to complete 90%.

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19. Establish the rate equation for 1st order reaction.

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20. Why helium does not form any compound ?

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21. Draw the structure of H_2SO_3

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22. Benzoic acid on reaction with $SOCI_2$ gives (A).(A) on reduction with $Pd - BaSO_4, H_2$ in presence of quinoline affords (B), (B) reacts with (C), (C) on reaction with PCI_5 gives (D). Write the structures of (A), (B), (C) and (D). What is the role of CH_3COONa in the conversion of (B) to (C)?

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23. An organic comppound produces acetic acid and ethanol on acid hydrolysis. Write the structural formula of the compound. How can you

prepare the compound from acetaldehyde in one step?

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Wbchse 2018 Part B

1. The unit of cell constant is -

A. cm

B. cm^{-1}

C. cm^2

D. $mol.\ lit^{-1}$

Answer: B

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2. Which of the following is required of the central metal in $\left[Cr(NH_3)_4(NO_2)Cl\right]^+$? (Atomic No. of Cr =24)

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3. What is the oxidation number of the central metal in $\left[Cr(NH_3)_4(NO_2)Cl\right]^+$? (Atomic No. of Cr = 24)

A. 0

B. $+1$

C. $+3$

D. $+2$

Answer: A

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4. On reacting with aqueous bromine at room temperature phenol forms which of the following ?

A. meta-Bromophenol

B. 2, 6-Dibromophenol

C. 2, 4, 6-Tribromophenol

D. 3,5-Dibromophenol

Answer: C

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5. Which of the following compounds is the most basic ?

A. 

B. 

C. 

D. 

Answer: B

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6. Which of the following can be considered as the monomer of natural rubber ?

A. 

B. 

C. 

D. 

Answer: A

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7. Which of the following artificial sweeteners is methyl ester of a dipeptide ?

A. Aspartame

B. Sucralose

C. Saccharine

D. Alitame

Answer: D

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8. Which of the following can be used as an antacid ?

A. Ranitidine

B. Histamine

C. Equanil

D. Aspirin

Answer: A

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9. The number of Cl^- ions present around each Na^+ ion in NaCl crystal lattice is-

A. 3

B. 4

C. 8

D. 6

Answer: C

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10. Which one has the highest coagulating power for ferric hydroxide sol ?

A. KCl

B. K_2SO_4

C. Na_3PO_4

D. NaCl

Answer: B

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11. Which of the following titanium compounds cannot be prepared ? (Atomic No. of Ti =22)

A. TiO

B. TiO_2

C. K_2TiO_4

D. $TiCl_2$

Answer: C

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12. For the compounds `CH_3Cl , CH_3I , CH_3Br and (##CHY_CHE_ORG_XII_P2_PYQ_18_E01_058_Q01.png" width="80%"> which of the following is the correct order of C-halogen bond length ?

A. 

B. 

C. 

D. 

Answer: B

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13. Which of the following compounds will take part in nucloephilic addition reaction most readily ?

A. CH_3COCH_3

B. CH_3CHO

C. C_6H_5CHO

D. $C_6H_5COC_6H_5$

Answer: D

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14. In which of the following orders base, phosphate and sugar are arranged in the nucleotide of DNA ?

A. Base-Phosphate-sugar

B. Base-Sugar-Phosphate

C. Phosphate-Base-Sugar

D. Sugar-Base-Phosphate

Answer: A

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15. What are the dispersed phase and dispersion medium in soap lather ?

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16. What is the purpose of adding a food preservative to a packaged food ?

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17. How many faraday of electricity is required to liberate 1 mole of copper from a copper sulphate solution ?

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18. Arrange K^+, Zn^{2+}, H^+ and Cu^{2+} ions in order of their tendency to be liberated at the cathode.

[Given:

$mE^0_{Cu^{2+}|Cu} = +0.34V, E^0_{2H^+|H_2} = 0.00V, E_{Zn^{2+}|Zn} = -.0.76V, E_{K^+|K} = -2.93V$

]

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19. Which of the following exhibits highest acidic character ?

CrO, Cr_2O_3, CrO_3

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20. What will be the oxidation number of Mn in the compound of Mn formed upon fusion of MnO_2 with KOH and KNO_3 ?

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Jee Main 2018

1. Phenol reacts with methyl chloroform in the presence of NaOH to form product A. A reacts with Br_2 to form product B . A and B are respectively-

A. 

B. 

C. 

D. 

Answer: A

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2. How long (appropriate) should water be electrolysed by passing through 100 amperes current so that the oxygen released can completely burn 27.66 g of diborane ?

(Atomic weight of B = 10.8 u)

A. 3.2 hours

B. 1.6 hours

C. 6.4 hours

D. 0.8 hours

Answer: A

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3. At $518^{\circ}C$, the rate od decomposition of a sample of gaseous acetaldehyde, initially at a pressure of 363 torr, was 1.00 torr.s^{-1} when 5% had reacted and $0.5\text{torr}.\ s^{-1}$ when 33% had reacted. The order of the reaction is -

A. 1

B. 0

C. 2

D. 3

Answer: C

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4. Glucose on prolonged heating will HI gives-

A. Hexanoic acid

B. 6-Iodohexanal

C. n-Hexane

D. 1-Hexene

Answer: C

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5. Consider the following reaction and statements-

$$\left[Co(NH_3)_4Br_2\right]^+ + Br^- \rightarrow \left[Co(NH_3)_3Br^3\right] + NH_3$$

[i] Two isomers are produced if the reactant complex ion is cis-isomer.

[ii]Two isomers are produced if the reactant complex ion is a trans-iosmer.

[iii] Only one isomer is produced if the reactant complex ions is a trans-isomer.

[iv] Only one isomer is produced if the reactant complex ion is a cis-isomer.

The correct statements are-

A. [iii] & [iv]

B. [ii] & [iv]

C. [i]& [ii]

D. [i] & [iii]

Answer: D

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6. Phenol on treatment with CO_2 in the presence of NaOH followed by acidification produces compound X as the major product. X on treatment

with $(CH_3CO)_2O$ in the presence of catalytic amount of H_2SO_4 produces-

A. 

B. 

C. 

D. 

Answer: C

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7. The compound that does not produce nitrogen gas by the thermal decompostion is -

A. NH_4NO_2

B. $(NH_4)_2SO_4$

C. $Ba(N_2)_2$

D. $(NH_4)_2Cr_2O_7$

Answer: B

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8. The predominant form of histamine present in human blood is (pk_a Histidine = 6.0)-

A. 

B. 

C. 

D. 

Answer: C

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9. Which type pf 'defect has the presence of cations in the interstitial sites ?

A. Frenkel defect

B. Metal deficiency defect

C. Schottky defect

D. Vacancy defect

Answer: A

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10. For 1 molal aqueous solution of the following components which one will show the highest freezing point ?

A. $\left[Co(H_2O)_4Cl_2\right]Cl.2H_2O$

B. $\left[Co(H_2O)_3Cl_3\right].3H_2O$

C. $\left[Co(H_2O)_6\right]Cl_3$

D. $\left[Co(H_2O)_5Cl\right]Cl_2.\ H_2O$

Answer: B

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Neet 2018

1. Which one of the following ions exhibits d-d transition and paramagnetism as well ?

A. MnO_4^-

B. $Cr_2O_7^-$

C. CrO_4^{2-}

D. MnO_4^{2-}

Answer: D

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2. Iron carbonyl, $Fe(CO)_5$ is -

A. Trinuclear

B. Mononuclear

C. Tetranuclear

D. Dinuclear

Answer: B

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3. The type of isomerism shown by the complex $\left[CoCl_2(en)_2\right]$ is -

A. Ionisation isomerism

B. Coordination isomerism

C. Geometrical isomerism

D. Linkage isomerism

Answer: C

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4. The geometry and magnetic behaviour of the complex $\left[Ni(CO)_4\right]$ are-

A. Square planar geometry and paramagnetic

B. Tetrahedral geometry and diamagnetic

C. Square planar geometry and paramagnetic

D. Tetrahedral geometry and paramagnetic

Answer: B

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5. The correct difference between first- and second -order reactions is that-

A. a first order reaction can be catalysed , a second order reaction cannot be catalysed

B. the half-life of a first order reaction does not depend on $[A]_0$, the half-life of a second order reaction does depend on $[A]_0$.

C. the rate of a first order reaction does not depend on reactant concentrations, the rate of a second order reaction does depend on reactant concentrations

D. the rate of a first order reaction does depend on reactant concentrations , the rate of a second-order reaction does not depend on reactant concentrations

Answer: B

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6. Which of the following compounds can form a zwitterion ?

A. Benzoic acid

B. Acetanilide

C. Aniline

D. Glycine

Answer: D

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7. Consider the change in oxidation state of bromide corresponding to different emf values as shown in the diagram below-

$$BrO_4^- \xrightarrow{1.82V} BrO_3^- \xrightarrow{1.5V} HBrO \xrightarrow{1.595V} Br_2 \xrightarrow{1.0652V} Br^-$$

Then the species undergoing disproportionation is -

A. Br_2

B. BrO_4^-

C. BrO_3^-

D. HBrO

Answer: D

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8. Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable molecular mass. It is due to their-

A. more extensive association of carboxylic acid via van der Waals force of attraction

B. formation of carboxylate ion

C. formation of intramolecular H-bonding

D. formation of intermolecular H-bonding

Answer: D

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9. Compound A, $C_8H_{10}O$, is found to react with NaOH (produced by reacting Y with NaOH) and yields a yellow precipitate with characteristic smell. A and Y are respectively-

A. 

B. 

C. 

D. 

Answer: A

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10. Which of the following statements is not true for halogens ?

A. All but flourine show positive oxidation states

B. All are oxidizing agents

C. All form monobasic oxoacids

D. Chlorine has the highest electron-gain enthalpy

Answer: A

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11. In the structure of CIF_3, the number of lone pairs of electrons on central atom 'Cl' is -

A. four

B. two

C. one

D. three

Answer: B

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12. Regarding cross-linked or network polymers, which of the following statements is incorrect ?

A. Examples are bakelite and melamine

B. They are formed from bi-and tri-functional monomers

C. They contain covalent bonds between various linear polymer chains

D. They contain strong covalent bonds in their polymer chains

Answer: D

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13. Nitration of aniline in strong acidic medium also gives m-nitroaniline because-

A. In absence of substituents nitro group always goes to n-position

B. In electrophilic substitution reactions amino group is meta direactive

C. In spite of substituents nitro group always goes to only m-position

D. In acidic (strong) medium aniline is present as anilinium ion

Answer: D

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14. The difference between amylose and amylopectin is -

A. Amylopectin have $1 \rightarrow 4\,\alpha$-linkage and $1 \rightarrow 6\,\beta$-linkage

B. Amylose have $1 \rightarrow 4\alpha$-linkage and $1 \rightarrow 6\beta$-linkage

C. Amylopectin have $\rightarrow 4\alpha$

D. Amylose is made up of glucose and galactose

Answer: C

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15. The compound A on treatment with Na gives B, and with PCl_5 gives C. B and C react together to give diethyl ether. A, B and C are in the order-

A. $C_2H_5Cl, C_2H_6, C_2H_5OH$

B. $C_2H_5OH, C_2H_5Cl, C_2H_5ONa$

C. $C_2H_5OH, C_2H_6, C_2H_5Cl$

D. $C_2H_5OH, C_2H_5Ona, C_2H_5Cl$

Answer: D

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16. The compound C_7H_8 undergoes the following reaction -

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

the product 'C' is-

A. 3-bromo-2 , 4,6-trichlorotoulene

B. $\alpha -$ bromotoulene

C. m-bromotoulene

D. p-bromotoulene

Answer: C

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17. On which of the following properties does the coagulating power of an iron depend ?

A. Both magnitude and sign of the charge on the ion

B. Size of the ion alone

C. The magnitude of the charge on the ion alone

D. The sign of charge on the ion alone

Answer: A

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18. Iron exhibits bcc structure at room temperature . Above $900^\circ C$, it transforms to fcc structure . The ratio of density of iron at room temperature to that ar $900^\circ C$(assuming molar mass and atomic radii of iron remain constant with temperature) is-

A. $\frac{3\sqrt{3}}{4\sqrt{2}}$

B. $\frac{4\sqrt{3}}{3\sqrt{2}}$

C. $\frac{\sqrt{3}}{\sqrt{2}}$

D. $\frac{1}{2}$

Answer: A

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19. When initial concentration of the reactant is doubled, the half-life period of a zero order reaction-

A. is tripled

B. is doubled

C. is halved

D. remains unchanged

Answer: B

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20. Considering Ellingham diagram , which of the following metals can be used to reduce alumina ?

A. Mg

B. Zn

C. Fe

D. Cu

Answer: A

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21. The correct order of N-compounds in its decreasing order of oxidation states is -

A. HNO_3, NH_4Cl, NO, N_2

B. NHO_3, NO, NH_4Cl, N_2

C. HNO_3, NO, N_2, NH_4Cl

D. NH_4Cl, N_2, NO, HNO_3

Answer: C

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