CHEMISTRY

BOOKS - MTG WBJEE CHEMISTRY (HINGLISH)

INTRODUCTION TO BIOMOLECULES

Wb Jee Workout Single Option Correct Type

1. Glucose when treated with CH_3OH in presence of dry HCl gas gives alpha and beta

methylglucosides because it contains

A. an aldehydic group

B. a $-CH_2OH$ group

C. a ring structure

D. five-OH groups

Answer: C

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2. The bond that determines the secondary structure of a protein is

A. co-ordinate bond

B. covalent bond

C. hydrogen bond

D. ionic bond.

Answer: C

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3. On hydrolysis of starch, we finally get

A. glucose

B. fructose

C. both

D. sucrose

Answer: A

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4. The term invert sugar refers to an equimolar mixture

A. D-Glucose and D-galactose

B. D-Glucose and D-fructose

C. D-Glucose and D-mannose

D. D-Glucose and D-ribose.

Answer: B

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5. In nucleic acids, the sequence is

A. Phosphate-Base-Sugar

B. Sugar-Base phosphate

C. Base sugar-phosphate

D. Base-Phosphat

Answer: C

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6. Which of the following does not exist as a zwitter ion?

A. Glycine

B. Alanine

C. Sulphanilic acid

D. p-Aminobenzoic acid

Answer: D

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7. Which one of the following is responsible for maintaining blood sugar level in human body?

A. Riboflavin

B. Insulin

C. Fats

D. Hormones

Answer: B

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8. The base adenine occurs in

A. DNA only

B. RNA only

C. DNA and RNA both

D. protein

Answer: C

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9. Which of the following does not reduce Benedict's solution?

A. Glucose

B. Fructose

C. Sucrose

D. Aldehyde

Answer: C

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10. The present in vitamin B_{12} is

A. iron

B. manganese

C. cobalt

D. magnesium

Answer: C

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11. The reaction of O_2 and CO with haemoglobin gives

A. only oxygen - haeme complex

B. only CO-haeme complex

C. both but oxygen - haeme complex is more stable

D. both but CO-haeme complex is more stable.

Answer: D

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12. In DNA, the complementary bases are

A. uracil and adenine : cytosine and guanine

B. adenine and thymine: guanine and cytosine

C. adenine and thymine: guanine and uracil

D. adenine and guanine : thymine and cytosine.

Answer: B

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13. Glucose gives silver mirror test with Tollen's reagent.It shows the presence of

A. an acid group

B. an alcoholic group

C. a ketonic group

D. an aldehydic group.

Answer: D

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14. Enzyme which breaks down starch to maltose is

A. maltase

B. zymase

C. diastase

D. Glucose

Answer: A

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15. Which of the following is the sweetest sugar?

A. Sucrose

B. Glucose

C. Fructose

D. Maltose

Answer: C

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16. Vitamin C is chemically

A. ascorbic acid

B. citric acid

C. aspirin

D. aspartic acid

Answer: A

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17. Which of the following molecule is capable of forming zwitter ion?

A. $CH_3 - CHOH - NH_2$

B. NH_2CH_2COOH

C. $CH_3 - COOH$

D. $CCl_3 - NO_2$

Answer: B

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18. The reason for double helical structure of DNA is due to the presence of

A. electrostatic attractions

B. van der Waals' forces

C. dipole - dipole interactions

D. hydrogen-bonding.

Answer: D

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19. Phospholipids are esters of glycerol with

A. three carboxylic acid residues

B. two carboxylic acid residues and one phosphate group

C. one carboxylic acid residue and two phosphate groups.

D. three phosphate groups

Answer: B

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20. Reduction of glucose with $NaBH_4$ gives

A. sorbitol

B. mannitol

C. n-Hexane

D. both (a) and (b)

Answer: A

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21. A vitamin that contains both N and P is

A. vitamin C

B. vitamin K

C. vitamin B_{12}

D. vitamin D

Answer: C

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22. Role of ATP in bioenergetics is

A. releasing energy

B. absorbing energy

C. transporting energy

D. conservation of energy

Answer: A

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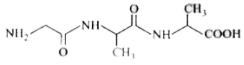
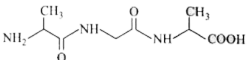
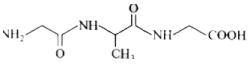
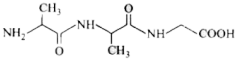
23. A tripeptide is written as Glycine-Alanine-Glycine. The correct structure of the tripeptide is

A. 

B. 

C. 

D. 

Answer: C

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24. Which of the following contributes to the double helical structure of DNA?

A. Hydrogen bond

B. Covalent bond

C. Disulphide bond

D. van der Waals force

Answer: A

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25. In haemoglobin the metal ion present is .

A. Fe^{2+}

B. Zn^{2+}

C. Co^{2+}

D. Cu^{2+}

Answer: A

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26. Which one is not a constituent of nucleic acid?

A. Uracil

B. Guanidine

C. Phosphoric acid

D. Ribose sugar

Answer: B

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27. In aqueous solution glucose remains as

A. only in open chain form

B. only in pyranose form

C. only in furanose form

D. in all three forms in equilibrium.

Answer: D

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28. An electric current is passed through an aqueous solution of a mixture of alanine (isoelectric point 6.0), glutamic acid (3.2) and arginine (10.7) buffered at pH 6. What is the fate of the three acids?

A. Glutamic acid migrates to anode at pH 6. Arginine is present as a cation and migrates to the cathode. Alanine in a dipolar ion remains uniformly distributed in solution.

B. Glutamic acid migrates to cathode and others remain uniformly distributed in solution.

C. All three remain uniformly distributed in solution.

D. All three move to cathode.

Answer: A

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29. Glucose reacts with acetic anhydride to form

A. monoacetate

B. tetra-acetate

C. penta-acetate

D. none of these.

Answer: C

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30. Acid or enzymatic hydrolysis of sucrose to give an equimolar mixture of glucose and fructose is called

A. esterification

B. inversion

C. saponification

D. insertion

Answer: B

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31. Calorific value is in the order

A. fats $>$ carbohydrates $>$ alcohol

B. carbohydrates $>$ fats $>$ alcohol

C. alcohol $>$ carbohydrates $>$ fats

D. fats $>$ alcohol $>$ carbohydrates,

Answer: D

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32. Chargaff's rule states that in an organism

A. amount of adenine (A) is equal to that of thymine (T) and amount of guanine (G) is equal to that of cytosine (C)

B. amount of adenine (A) is equal to that of guanine (G) and the amount of thymine (T) is equal to that of cytosine (C)

C. amount of adenine (A) is equal to that of cytosine (C) and the amount of thymine (T) is equal to that of guanine (G)

D. amounts of all bases are equal.

Answer: A

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33. Two samples of DNA, A and B have melting points 340 K and 350 K respectively. This is because

A. B has more GC content than A

B. A has more GC content than B

C. B has more AT content than B

D. both have same AT content.

Answer: A

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34. Glucose molecule reacts with X number of phenylhydrazine to yield osazone. The value of 'X' is

A. four

B. one

C. two

D. three

Answer: D

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35. Which of the following statements is correct?

A. The Ruff procedure lengthens an aldose chain and gives a single product

B. The Ruff procedure shortens an aldose chain and gives two epimers

C. The Kiliani-Fischer procedure shortens an aldose chain and gives a single product

D. The Kiliani-Fischer procedure lengthens an aldose chain and gives two epimers.

Answer: D

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36. Which of the following treatment will convert starch directly into glucose?

A. Heating with dil. H_2SO_4

B. Fermentation by diastase

C. Fermentation by zymase

D. Heating with dil. NaOH

Answer: A

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37. A certain compound gives negative test with ninhydrin and positive test with Benedict's solution. The compound is

A. a protein

B. a monosaccharide

C. a lipid

D. an amino acid

Answer: B

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38. Compound A, $C_3H_{10}O_s$, gives a tetraacetate with $(CH_3, CO)_2, O$, and oxidation of A with $Br_2 - H_2O$ gives an acid, $C_5H_{10}O_6$. Reduction of 'A' with HI gives iso-pentane. There are two possible structures for compound 'A' which can be distinguished by using

A. HIO_4

B. excess of P,HI

C. phenylhdrazine

D. Tollens' reagent

Answer: C

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39. Which statement about the form of mannose is not correct?

A. It exists as two anomeric stereoisomers

B. It reacts with Tollens' reagent to give a silver

C. Reaction with excess CH_3I and AgOH gives a non-reducing penta-O-methyl derivative

D. It resists reduction with aqueous sodium borohydride.

Answer: D

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40. Periodic acid splits glucose and fructose into formaldehyde and formic acid. Ratio of moles of formic acid in glucose and fructose is

A. $1:2$

B. $5:3$

C. $1:1$

D. $2:3$

Answer: B

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41. The specific rotation for the C-anomer of a carbohydrate is $+29^{\circ}$ and that of β-anomer is -17° Due to mutarotation, the equilibrium specific rotation is $+14^{\circ}$. The percentage of cl-anomer is

A. $45.6\,\%$

B. $55.2\,\%$

C. $60.2\,\%$

D. $67.4\,\%$

Answer: D

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42. Which amino acid has phenolic OH group as its backbone?

A. Glycine

B. Leucine

C. Serine

D. Tyrosine

Answer: D

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43. One hundred grams of a food product was found to contain 6.0 g of nitrogen. If protein contains 16% nitrogen. What is the percentage of protein in food?

A. 0.19

B. $37.5\ \%$

C. $1.9\ \%$

D. $9.5\ \%$

Answer: B

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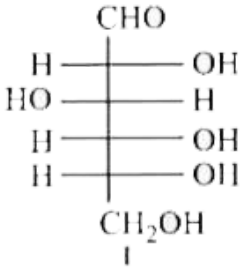
44. Which of the following aldohexoses give the same osazone derivative?



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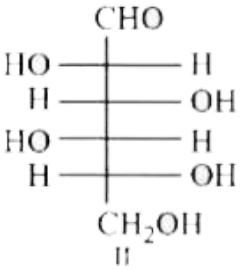

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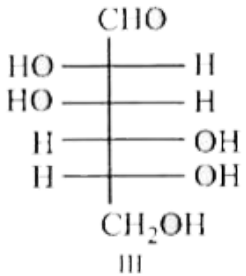

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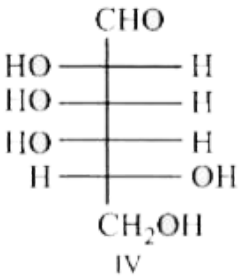

IV

A. I and IV

B. I and III

C. II and III

D. III and IV

Answer: B

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45. If K_2 and K_2 are the ionization consatnats of $H_3NCHRCOOH$ and $H_3\overset{+}{N}CHRCOO^-$,

respectively , the pH of the solution at the isoelectric point is .

A. $pH = pK_1 + pK_2$

B. $pH = (pK_1 pK_2)^{1/2}$

C. $pH = (pK_1 + pK_2)^{1/2}$

D. $pH = (pK_1 + pK_2)/2$

Answer: D

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Wb Jee Workout One Or More Than One Option Correct Type

1. Which of the following pairs can be distinguished by Fehling's solution?

A. Glucose, fructose

B. Ribose ,glucose

C. Glucose,sucrose

D. Fructose , sucrose

Answer: C::D

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2. Which of the following statements about starch are incorrect?

A. It is a disaccharide

B. It occurs in the walls of plants.

C. It gives a dark blue colour with I, solution.

D. It gives a red precipitate on boiling with Fehling's solution

Answer: A::B::C

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3. Which of the following is not correct regarding sucrose?

A. Acid catalysed hydrolysis of sucrose yields I mole of D-glucose and 1 mole of L-fructose.

B. It gives negative test with Benedict's solution.

C. It doesn't form osazone derivative.

D. It undergoes mutarotation.

Answer: A::D

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4. Which of the following compounds gives ethyl alcohol with an enzyme zymase?

A. Glucose

B. Surcose

C. Fructose

D. Sorbitol.

Answer: A::C

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5. Sanger's reagent reacts with functional group in a peptide ?

A. Free amino groups

B. The phenolic hydroxyl group in tyrosine

C. The aromatic heterocyclic rings of histidine and tryptophan

D. Free carboxylic groups

Answer: A::B::C::D

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6. Glucose can be classified as

A. aldohexose

B. carbohydrate

C. reducing sugar

D. monosaccharide.

Answer: A::B::C

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7. $D(+) - glu\cos e \xrightarrow{5\,(CH_3CO)_2O} D(+)$

glucose pentaccetate. Which of the following

statement is true about the product ?

A. It will reduce Tollens' reagent.

B. It will reduce Fehling reagent.

C. It reacts with phenylhydrazine

D. It undergoes aldol condensation,

Answer: A::B

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8. Glucose gives positive test with

A. Fehling's solution

B. Tollens' reagent

C. Schiff's reagent

D. Sodium bisulphite.

Answer: A::B

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9. D-2-deoxyglucose and D-3-deoxyglucose differ in

A. latter gives osazone with phenyl hydrazine.

B. former gives only phenyl hydrazone with phenyl hydrazine.

C. former can be converted to latter using dil. HNO_3

D. former can be converted to latter using $Pb(OAc)_4$

Answer: A::B

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10. Which of the following does not give only glucose on hydrolysis?

A. Sucrose

B. Raffinose

C. Maltose

D. Galactose

Answer: A::B::C

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Wb Jee Previous Years Questions Single Option Correct Type

1. The optically active molecule is .

A. 

B. 

C. 

D. 

Answer: C

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2. The correct structure of the dipeptide gly - ala is .

A. 

B. 

C. 

D. 

Answer: C

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3. Ribose and 2 - deoxyribose can be differentiated by .

A. Fehling's reagent

B. Tollen's reagent

C. Barfoed's reagent

D. Osazone formation.

Answer: D

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4. In DNA, the consecutive deoxynucleotide are connected via.

A. phosphodiester linkage

B. phosphomonoester linkage

C. phosphotriester linkage

D. amide linkage

Answer: A

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5. The number of amino acids and number of peptide bonds in a linear tetrapeptide (made of different amino acids) are respectively.

A. 4 and 4

B. 5 and 5

C. 5 and 4

D. 4 and 3

Answer: D

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6. ADP and ATP differ in the number of

A. phosphate units

B. ribose , units

C. adenine base

D. nitrogen atom.

Answer: A

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7. Within the list show below , the correct pair of structure of alanin in pH ranges 2-4 and 9-11 is .

I. $H_3N^+ - CH(CH_3)CO_2H$

II. $H_2N - CH(CH_3)CO_2^-$

III. $H_3N^+ - CH(CH_3)CO_2^-$

IV. $H_2N - CH(CH_3)CO_2H$

A. I,II

B. I,III

C. II,III

D. III,IV

Answer: A

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