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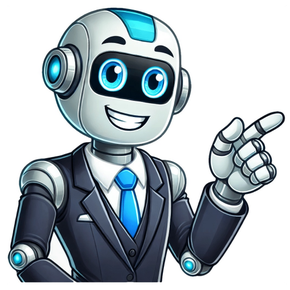

2. Chapter 1 - Chemistry of Carbohydrates Note – Tick the correct answer. Answers with explanation are given at the end. 1. Number of asymmetric carbon atoms in glucose is: A. One B. Two C. Three D. Four 2. -1, 4-Glycosidic bond is present in: A. Maltose B. Lactose C. Sucrose D. None of these 3. Number of stereoisomers of glucose is: A. 2 B. 4 C. 8 D. 16 4. A homopolysaccharide made up of fructose is: A. Glycogen B. Dextrin C. Cellulose D. Inulin 5. Aglycone portion in cardiac glycosides is made up of: A. Glucose B. Steroids C. Mannose D. Galactose 6. Identical osazones are formed by: A. Glucose and fructose B. Glucose and mannose C. Mannose and fructose D. All of these 7. Maltose can be formed by hydrolysis of: A. Starch B. Dextrin C. Glycogen D. All of these 8. -1, 6-Glycosidic bond is not present in: A. Glycogen B. Dextrin C. Amylose D. Amylopectin 9. Sulfated iduronic acid is present in: A. Hyaluronic acid B. Chondroitin sulfate C. Heparin D. All of these 10. Monosaccharides can be separated by: A. Electrophoresis B. Chromatography C. Salting out D. None of these 11. Fructose is present in hydrolysate of: A. Sucrose B. Inulin C. Both of these D. Neither of these 3. 12. N-Acetylgalactosamine sulfate is present in: A. Hyaluronic acid B. Heparin C. Chondroitin sulfate D. None of these 13. Invertase catalyzes the hydrolysis of: A. Maltose B. Lactose C. Sucrose D. None of these 14. In fructofuranose, anomeric carbon atom is: A. Carbon 1 B. Carbon 2 C. Carbon 3 D. Carbon 4 15. A carbohydrate found in DNA is: A. Ribose B. Deoxyribose C. Ribulose D. All of these 16. A monosaccharide not having D- and L-isomers is: A. Ribose B. Deoxyribose C. Erythrose D. Dihydroxyacetone 17. Ribulose is a/an: A. Ketotetrose B. Aldotetrose C. Ketopentose D. Aldopentose 18. In D-glyceraldehyde, –OH group is present on the right-hand side of carbon atom number: A. 1 B. 2 C. 3 D. 1, 2 and 3 19. A disaccharide made up of two glucose units is: A. Sucrose B. Maltose C. Lactose D. Dextrin 20. A carbohydrate, commonly known as dextrose, is: A. Dextrin B. D-Fructose C. D-Glucose D. Glycogen 21. Amino sugars are present in: A. Hyaluronic acid B. Chondroitin sulfate C. Erythromycin D. All of these 22. A carbohydrate found only in milk is: A. Glucose B. Galactose C. Lactose D. Maltose 23. A carbohydrate, known commonly as invert sugar, is: A. Fructose B. Sucrose C. Glucose D. Lactose 4. 24. A homopolysaccharide among the following is: A. Heparin B. Hyaluronic acid C. Dermatan sulfate D. Cellulose 25. A heteropolysaccharide among the following is: A. Inulin B. Cellulose C. Heparin D. Dextrin 26. The predominant form of glucose in solution is: A. Acyclic form B. Hydrated acyclic form C. Glucofuranose D. Glucopyranose 27. Optical isomerism is denoted by: A. D- and L- B. d- and l- C. (+) and (–) D. Any of these 28. An L-isomer of monosaccharide formed in human body is: A. L-Fructose B. L-Erythrose C. L-Xylose D. L-Xylulose 29. A pentose found in nucleotides is: A. D-Ribose B. L-Ribose C. D-Ribulose D. L-Ribulose 30. The following causes laevorotation: A. D-Fructose B. L-Glucose C. L-Ribose D. All of these 31. In straight chain structure of D-glucose, –OH group is present on left hand side of carbon atom number: A. 2 B. 3 C. 4 D. 5 32. In straight chain structure of D-ribose, –OH group is present on right hand side of carbon atom number: A. 2 B. 3 C. 4 D. All of these 33. The carbon atom which becomes asymmetric when the straight chain form of a monosaccharide changes into ring form is known as: A. Anomeric carbon atom B. Epimeric carbon atom C. Isomeric carbon atom D. None of these 5. 34. In α-D-glucopyranose, –OH groups projecting below the plane of the ring, are attached to carbon atoms: A. 1, 2 and 3 B. 1, 2 and 4 C. 2, 3 and 4 D. 1, 2 and 5 35. In glucopyranose, the anomeric carbon is: A. Carbon 1 B. Carbon 2 C. Carbon 5 D. Carbon 6 36. The smallest monosaccharide having furanose ring structure is: A. Erythrose B. Ribose C. Glucose D. Fructose 37. The specific rotation of -D-glucopyranose is: A. +19° B. +52.5° C. +92° D. +112° 38. The specific rotation of -D-glucopyranose is: A. +19° B. +52.5° C. +92° D. +112° 39. The ratio of -D-glucopyranose to -D-glucopyranose at equilibrium is nearly: A. 2 : 1 B. 1 : 1 C. 1 : 2 D. 1 : 3 40. The following is an epimeric pair: A. Glucose and fructose B. Glucose and galactose C. Galactose and mannose D. Lactose and maltose 41. Similar osazones are formed by: A. Glucose and mannose B. Mannose and galactose C. Glucose and galactose D. None of these 42. -Glycosidic bond is present in: A. Lactose B. Maltose C. Sucrose D. All of these 43. Branching occurs in glycogen approximately after every: A. 4–6 glucose units B. 12–15 glucose units C. 16–18 glucose units D. 20–24 glucose units 6. 44. Mucopolysaccharides are also known as: A. Mucoproteins B. Glycoproteins C. Glycosaminoglycans D. Homopolysaccharides 45. N-Acetylglucosamine is present in: A. Hyaluronic acid B. Chondroitin sulfate C. Heparin D. All of these 46. Sedoheptulose is a: A. Ketose B. Pentose C. Disaccharide D. Constituent of heparin 47. A lubricant present in joints is: A. Heparin B. Heparan sulphate C. Chondroitin sulphate D. Hyaluronic acid 48. The following is not present in plants: A. Cellulose B. Fructose C. Lactose D. Sucrose 49. Glycogen: A. Is made up of glucose B. Is unbranched C. Has -1, 4-glycosidic bonds D. All of these 50. Inulin: A. Is present in muscles B. Is a homopolysaccharide C. Decreases blood glucose D. Is metabolized in liver 7. Questions with Explanatory Answers 1. Number of asymmetric carbon atoms in glucose is: A. One B. Two C. Three D. Four Answer D (Carbon atom numbers 2, 3, 4 and 5 are asymmetric carbon atoms in glucose.) 2. -1, 4-Glycosidic bond is present in: A. Maltose B. Lactose C. Sucrose D. None of these Answer B (In lactose, carbon atom 1 of galactose, having configuration, is bonded to carbon 4 of glucose. Hence the bond is -1, 4-glycosidic bond. In maltose, the bond is -1, 4-glycosidic bond. In sucrose, the bond is -1, 2-glycosidic bond.) 3. Number of stereoisomers of glucose is: A. 2 B. 4 C. 8 D. 16 Answer D (Number of stereoisomers of a compound is 2n where n is the number of asymmetric carbon atoms in the compound. Glucose has 4 asymmetric carbon atoms. Hence, the number of stereoisomers in 24 = 16.) 4. A homopolysaccharide made up of fructose is: A. Glycogen B. Dextrin C. Cellulose D. Inulin Answer D (Glycogen, dextrin and cellulose are made up of glucose. Inulin is made up of fructose). 8. 5. Aglycone portion in cardiac glycosides is made up of: A. Glucose B. Steroids C. Mannose D. Galactose Answer B (The non-carbohydrate component of a glycoside is known as its aglycone portion. Steroids constitute the aglycone portion in cardiac glycosides.) 6. Identical osazones are formed by: A. Glucose and fructose B. Glucose and mannose C. Mannose and fructose D. All of these Answer D (Glucose, mannose and fructose differ in structure only in respect of their carbon atoms 1 and 2. Differences in carbon atoms 1 and 2 are obliterated when these are converted into their osazones. Hence, all three of them form identical osazones.) 7. Maltose can be formed by hydrolysis of: A. Starch B. Dextrin C. Glycogen D. All of these Answer D (Starch, dextrin and glycogen are polymers of glucose. When they are hydrolyzed, the dimers that are formed are maltose molecules.) 8. -1, 6-Glycosidic bond is not present in: A. Glycogen B. Dextrin C. Amylose D. Amylopectin Answer C (-1, 6-Glycosidic bonds are present at branch points in starch, dextrin and glycogen. Amylose is the unbranched component of starch and, hence, has no -1, 6-glycosidic bonds.) 9. Sulfated iduronic acid is present in: A. Hyaluronic acid B. Chondroitin sulfate C. Heparin D. All of these Answer C (Iduronic acid is not present in hyaluronic acid and chondroitin sulfate. It is present in heparin.) 9. 10. Monosaccharides can be separated by: A. Electrophoresis B. Chromatography C. Salting out D. None of these Answer B (Monosaccharides are uncharged molecules. They don't move in an electric field. They are too small to be salted out. But they can be separated by chromatography.) 11. Fructose is present in hydrolysate of: A. Sucrose B. Inulin C. Both of these D. Neither of these Answer C (Sucrose is made up of glucose and fructose. Inulin is made up of fructose.) 12. N-Acetylgalactosamine sulfate is present in: A. Hyaluronic acid B. Heparin C. Chondroitin sulfate D. None of these Answer C (N-Acetylgalactosamine sulfate is present only in chondroitin sulphate.) 13. Invertase catalyzes the hydrolysis of: A. Maltose B. Lactose C. Sucrose D. None of these Answer C (Sucrose is also known as invert sugar. Sucrase, which hydrolyses sucrose, is also known as invertase.) 14. In fructofuranose, anomeric carbon atom is: A. Carbon 1 B. Carbon 2 C. Carbon 3 D. Carbon 4 Answer B (Carbon 2 is the anomeric carbon in fructofuranose.) 15. A carbohydrate found in DNA is: A. Ribose B. Deoxyribose C. Ribulose D. All of these Answer B (Ribose is the sugar present in RNA and deoxyribose is the sugar present in DNA.) 16. A monosaccharide not having D- and L-isomers is: A. Ribose B. Deoxyribose C. Erythrose D. Dihydroxyacetone Answer D (Dihydroxyacetone has no asymmetric carbon atom and hence no stereoisomers.) 10. 17. Ribulose is a/an: A. Ketotetrose B. Aldotetrose C. Ketopentose D. Aldopentose Answer C (Ribose is an aldopentose, and the corresponding ketopentose is ribulose.) 18. In D-glyceraldehyde, –OH group is present on the right-hand side of carbon atom number: A. 1 B. 2 C. 3 D. 1, 2 and 3 Answer B (The only asymmetric carbon atom in glyceraldehyde is carbon 2. In the D-isomer of glyceraldehyde, –OH group is present on the right-hand side of the asymmetric carbon atom.) 19. A disaccharide made up of two glucose units is: A. Sucrose B. Maltose C. Lactose D. Dextrin Answer B (Dextrin is not a disaccharide. Sucrose is made up of glucose and fructose. Lactose is made up of glucose and galactose. Maltose is made up of two glucose units.) 20. A carbohydrate, commonly known as dextrose, is: A. Dextrin B. D-Fructose C. D-Glucose D. Glycogen Answer C (Since D-Glucose causes dextrorotation, it is also known as dextrose.) 21. Amino sugars are present in: A. Hyaluronic acid B. Chondroitin sulfate C. Erythromycin D. All of these Answer D (All contain amino sugars in their structure.) 22. A carbohydrate found only in milk is: A. Glucose B. Galactose C. Lactose D. Maltose Answer C (Lactose, also known as milk sugar, is present only in milk of mammals.) 11. 23. A carbohydrate, known commonly as invert sugar, is: A. Fructose B. Sucrose C. Glucose D. Lactose Answer B (Sucrose is also known as invert sugar because its direction of optical rotation is reversed/inverted on hydrolysis.) 24. A homopolysaccharide among the following is: A. Heparin B. Hyaluronic acid C. Dermatan sulfate D. Cellulose Answer D (Cellulose is a homopolysaccharide. The other three are heteropolysaccharides.) 25. A heteropolysaccharide among the following is: A. Inulin B. Cellulose C. Heparin D. Dextrin Answer C (Heparin is a heteropolysaccharide. The other three are homopolysaccharides.) 26. The predominant form of glucose in solution is: A. Acyclic form B. Hydrated acyclic form C. Glucofuranose D. Glucopyranose Answer D (When glucose is dissolved, most of it is present as glucopyranose.) 27. Optical isomerism is denoted by: A. D- and L- B. d- and l- C. (+) and (–) D. Any of these Answer C [Optical isomers of any compound are shown by a (+) or a (–) sign preceding the name of the isomer. A plus sign shows that the isomer causes dextrorotation and a minus sign shows that the isomer causes laevorotation.] 28. An L-isomer of monosaccharide formed in human body is: A. L-Fructose B. L-Erythrose C. L-Xylose D. L-Xylulose Answer D (L-Xylulose is formed in human beings in uronic acid pathway. The other three are not formed in human beings.) 12. 29. A pentose found in nucleotides is: A. D-Ribose B. L-Ribose C. D-Ribulose D. L-Ribulose Answer A (D-Ribose is a constituent of ribonucleotides. The other three are not found in nucleotides.) 30. The following causes laevorotation: A. D-Fructose B. L-Glucose C. L-Ribose D. All of these Answer D (D-Isomer of fructose causes laevorotation as do the L-isomers of glucose and ribose.) 31. In straight chain structure of D-glucose, –OH group is present on left hand side of carbon atom number: A. 2 B. 3 C. 4 D. 5 Answer B (An −OH group is present on the left-hand side of carbon atom 3 in D-glucose.) 32. In straight chain structure of D-ribose, –OH group is present on right hand side of carbon atom number: A. 2 B. 3 C. 4 D. All of these Answer D (An –OH group is present on right hand side of carbon atoms 2, 3 and 4 in D-ribose.) 13. 33. The carbon atom which becomes asymmetric when the straight chain form of a monosaccharide changes into ring form is known as: A. Anomeric carbon atom B. Epimeric carbon atom C. Isomeric carbon atom D. None of these Answer A (When the straight chain form of a monosaccharide changes into ring form, an additional carbon atom becomes asymmetric which is known as the anomeric carbon atom.) 34. In α-D-glucopyranose, –OH groups projecting below the plane of the ring, are attached to carbon atoms: A. 1, 2 and 3 B. 1, 2 and 4 C. 2, 3 and 4 D. 1, 2 and 5 Answer B (As seen in the diagram above, the –OH groups projecting below the plane of the ring, are attached to carbon atoms1, 2 and 4 in α-D-glucopyranose.) 35. In glucopyranose, the anomeric carbon is: A. Carbon 1 B. Carbon 2 C. Carbon 5 D. Carbon 6 Answer A (Carbon 1 becomes asymmetric and hence anomeric when straight-chain form of glucose changes into glucopyranose.) 36. The smallest monosaccharide having furanose ring structure is: A. Erythrose B. Ribose C. Glucose D. Fructose Answer B (A monosaccharide smaller than a pentose cannot exist in furan ring form.) 37. The specific rotation of -D-glucopyranose is: A. +19° B. +52.5° C. +92° D. +112° Answer D (Of the two anomers of glucose, -D-glucopyranose causes a specific rotation of +112°) 14. 38. The specific rotation of -D-glucopyranose is: A. +19° B. +52.5° C. +92° D. +112° Answer A (Of the two anomers of glucose, -D-glucopyranose has a specific rotation of +19°) 39. The ratio of -D-glucopyranose to -D-glucopyranose at equilibrium is nearly: A. 2 : 1 B. 1 : 1 C. 1 : 2 D. 1 : 3 Answer C (At equilibrium, one part of -D-glucopyranose and two parts of -D-glucopyranose are present in solution.) 40. The following is an epimeric pair: A. Glucose and fructose B. Glucose and galactose C. Galactose and mannose D. Lactose and maltose Answer B (When two monosaccharides differ from each other in respect of orientation of −H and −OH groups around a single carbon atom, they are known as epimers of each other. Glucose and galactose are epimers as they differ in respect of carbon 4 only. Galactose and mannose differ in respect of carbons 2 and 4. Glucose and fructose are aldose-ketose isomers. Lactose and maltose are disaccharides.) 41. Similar osazones are formed by: A. Glucose and mannose B. Mannose and galactose C. Glucose and galactose D. None of these Answer A (Differences in substituents around carbon atoms 1 and 2 are obliterated when carbohydrates are converted into their osazones. Carbohydrates that differ in structure only in respect of their carbon atoms 1 and 2 form identical osazones. Glucose and mannose are such a pair, differing in carbon atom 2. Mannose and galactose differ in carbon atoms 2 and 4. Glucose and galactose differ in carbon atom 4.) 15. 42. -Glycosidic bond is present in: A. Lactose B. Maltose C. Sucrose D. All of these Answer B (-Glycosidic bond is present in maltose. Lactose and sucrose have -glycosidic bonds.) 43. Branching occurs in glycogen approximately after every: A. 4–6 glucose units B. 12–15 glucose units C. 16–18 glucose units D. 20–24 glucose units Answer B (Branching occurs in glycogen approximately after every 12–15 glucose units.) 44. Mucopolysaccharides are also known as: A. Mucoproteins B. Glycoproteins C. Glycosaminoglycans D. Homopolysaccharides Answer C (Glycosaminoglycans is another name given to mucopolysaccharides.) 45. N-Acetylglucosamine is present in: A. Hyaluronic acid B. Chondroitin sulfate C. Heparin D. All of these Answer A (N-Acetylglucosamine is the amino sugar present in hyaluronic acid. Chondroitin sulfate has N-acetylgalactosamine. Heparin has glucosamine sulphate.) 46. Sedoheptulose is a: A. Ketose B. Pentose C. Disaccharide D. Constituent of heparin Answer A (Sedoheptulose is not a pentose. It is not a disaccharide. It is not a constituent of heparin. It is a ketose or more precisely a ketoheptose.) 16. 47. A lubricant present in joints is: A. Heparin B. Heparan sulphate C. Chondroitin sulphate D. Hyaluronic acid Answer D (Of these, only hyaluronic acid is a lubricant, and is present in joints.) 48. The following is not present in plants: A. Cellulose B. Fructose C. Lactose D. Sucrose Answer C (Lactose is present in mammals only. It is not present in any plant.) 49. Glycogen: A. Is made up of glucose B. Is unbranched C. Has -1, 4-glycosidic bonds D. All of these Answer A (Glycogen is made up of glucose, is highly branched and has -1, 4- and -1, 6- glycosidic bonds.) 50. Inulin: A. Is present in muscles B. Is a homopolysaccharide C. Decreases blood glucose D. Is metabolized in liver Answer B (Inulin is a homopolysaccharide. It is not present in muscles and cannot be metabolized by human beings. The compound which decreases blood glucose is insulin, and not inulin.) 100%(3)100% found this document useful (3 votes)2K views8 pagesThis document contains a 20 question multiple choice exam about carbohydrate chemistry. The exam tests knowledge of carbohydrate structures like pyranose and furanose rings, representations …AI-enhanced title and descriptionSaveSave carbohydrates-multiple-choice-questions-11-pdjjj For Later100%100% found this document useful, undefined100%(3)100% found this document useful (3 votes)2K views8 pagesThis document contains a 20 question multiple choice exam about carbohydrate chemistry. The exam tests knowledge of carbohydrate structures like pyranose and furanose rings, representations like Haworth projections, monosaccharide combinations in disaccharides, and the roles of important carbohydrates like glycogen, cellulose and amylose. It also covers carbohydrate bonding, disease related to carbohydrate metabolism, and the digestion of lactose. The exam is meant to be completed in 30 minutes.100%(3)100% found this document useful (3 votes)2K views8 pagesThis document contains a 20 question multiple choice exam about carbohydrate chemistry. The exam tests knowledge of carbohydrate structures like pyranose and furanose rings, representations …AI-enhanced title and description 1 Carbohydrates are also known as_____ A Hydrates of carbon B Carbonates C Glycolipids D Polysaccharides Answer & Explanation Answer: Hydrates of carbon 2 Class of carbohydrate which cannot be hydrolyzed further, is known as? A Disaccharides B Polysaccharides C Proteoglycan D Monosaccharide Answer & Explanation Advertisement 3 Chitin consists of A N-acetyl muramic acid B N-acetyl glucosamine C D-glucose units D N-acetyl muramic acid and N-acetyl glucosamine Answer & Explanation Answer: N-acetyl glucosamine 4 Amylopectin has A β-1-4 and β-1-6 linkage B β-1-2 linkage C α-1-4 and α-1-6 linkage D α-1-2 linkage Answer & Explanation Answer: α-1-4 and α-1-6 linkage 5 Cellulose is made up of repeating units of A β-1-4 linkage between D-glucose units B β-1-2 linkage between D-glucose units C α-1-4 linkage between D-glucose units D α-1-2 linkage between D-glucose units Answer & Explanation Answer: β-1-4 linkage between D-glucose units 6 Starch consists of A unbranched amylose and branched amylopectin B branched amylose and branched amylopectin C unbranched amylose and unbranched amylopectin D none of these Answer & Explanation Answer: unbranched amylose and branched amylopectin 7 In maltose, the linkage is A β-1-4 linkage B β-1-2 linkage C α-1-4 linkage D α-1-2 linkage Answer & Explanation 8 In lactose, the linkage is A β-1-4 linkage B β-1-2 linkage C α-1-4 linkage D α-1-2 linkage Answer & Explanation 9 Lactose is a disaccharide consists of A glucose and fructose B glucose and galactose C glucose and sucrose D glucose and ribose Answer & Explanation Answer: glucose and galactose 10 Sucrose is a A monosaccharide B disaccharide C polysaccharide D triose Answer & Explanation 11 In polysaccharides, monosaccharaides are joined by A Peptide bond B Glucose bond C Glycosidic bond D Covalent bond Answer & Explanation 12 Oligosaccharides linked to proteins are called A Glycoproteins B Glycolipids C Galactosides D Ganglioside Answer & Explanation 13 Which of the following is a reducing sugar A Glucose B Dihydroxyacetone C Erythulose D None of these Answer & Explanation 14 Smallest carbohydrates are trioses. Which of the following is a triose? A Glucose B Ribulose C Ribose D Glyceraldehyde Answer & Explanation 15 Carbohydrates accounts A 30% in plants and 20% in animals B 30% in plants and 10% in animals C 30% in plants and 1% in animals D 50% in plants and 50% in animals Answer & Explanation Answer: 30% in plants and 1% in animals 16 Glycogen in animals are stored in A Liver and spleen B Liver and muscles C Liver and bile D Liver and adipose tissue Answer & Explanation 17 Nutritional polysaccharides are A Starch and glycogen B Starch and chitin C Starch and cellulose D Starch and glucose Answer & Explanation Answer: Starch and glycogen 18 Structural polysaccharides include A cellulose, hemicellulose and chitin B cellulose, starch and chitin C cellulose, starch and glycogen D cellulose, glycogen and chitin Answer & Explanation Answer: cellulose, hemicellulose and chitin 19 Carbohydrates are A polyhydroxy aldehydes and phenols B polyhydroxy aldehydes and ketones C polyhydroxy ketones and phenols D polyhydroxy phenols and alcohols Answer & Explanation Answer: polyhydroxy aldehydes and ketones 20 The general formula of carbohydrate is A (CH2O)n B (C4H2O)n C (C6H2O)n D (C2H2O)n COOH Answer & Explanation 73%(11)73% found this document useful (11 votes)16K views6 pagesThese multiple choice questions assess knowledge of carbohydrates: - Carbohydrates include monosaccharides like glucose, disaccharides like maltose, and polysaccharides like starch and cellu…AI-enhanced title and descriptionSaveSave Mcq on Carbohydrates For Later73%73% found this document useful, undefined73%(11)73% found this document useful (11 votes)16K views6 pagesThese multiple choice questions assess knowledge of carbohydrates: - Carbohydrates include monosaccharides like glucose, disaccharides like maltose, and polysaccharides like starch and cellulose. - They perform structural and storage functions in plants and animals and are linked by glycosidic bonds. - The questions cover carbohydrate structure, classification, examples, and roles in biology.73%(11)73% found this document useful (11 votes)16K views6 pagesThese multiple choice questions assess knowledge of carbohydrates: - Carbohydrates include monosaccharides like glucose, disaccharides like maltose, and polysaccharides like starch and cellu…AI-enhanced title and description Which among the following is NOT a disaccharide? LactoseMaltoseSucroseDextroseGlucose India's Super Teachers for all govt. exams Under One Roof Enroll For Free Now Concept: Disaccharides: Disaccharides on hydrolysis give two molecules of the same or different monosaccharides. Examples are: Sucrose, maltose, lactose etc. Their general formula is C12H22O11. They may be reducing or non-reducing depending on the position of linkages between the two monosaccharide units. Monosaccharides: These are the simplest carbohydrates that cannot be hydrolyzed into smaller molecules. Their general formula is (CH2O)n where n = 1 to 7. Eg: Ribose, Glucose, Fructose. Explanation: The given carbohydrate molecules are tabulated below: Carbohydrates Other names Chemical formula Source Class of Carbohydrate Lactose Milk sugar C12H22O11 Occurs in milk. Disaccharide Maltose Malt sugar C12H22O11 Obtained by partial hydrolysis of starch by diastase, an enzyme present in malt (sprouted barley seeds). Disaccharide Sucrose Cane sugar C12H22O11 manufactured from sugarcane or beetroot. Disaccharide Dextrose D(+) Glucose / Grape sugar C6H12O6 Present in sweet fruits and honey. Monosaccharide Hence, among the given carbohydrates, Dextrose is NOT a disaccharide. Additional Information Carbohydrates: They play a vital role in our life. Carbohydrates are defined as polyhydroxy aldehydes or polyhydroxy ketones or substance which give these on hydrolysis. They contain at least one asymmetric carbon atom. Classification of Carbohydrates: Carbohydrates are broadly divided into 3 major classes depending on the number of simple sugar units present in their molecule. 1. Monosaccharides 2. Oligosaccharides 3. Polysaccharides Key Points a) Monosaccharides: These are the simplest carbohydrates that cannot be hydrolyzed into smaller molecules. Their general formula is (CH2O)n where n = 1 to 7. Eg: Ribose, Glucose, Fructose. b) Oligosaccharides: These carbohydrates on hydrolysis give 2 to 9 molecules of monosaccharides. Depending on the number of monosaccharide molecules obtained, they are further classified as di, tri, tetrasaccharides, etc. Disaccharides - On hydrolysis gives two molecules of the same or different monosaccharides. Trisaccharides - On hydrolysis gives three molecules of the same or different monosaccharides. Tetrasaccharides - On hydrolysis gives four molecules of the same or different monosaccharides. c) Polysaccharides: They are carbohydrates which on hydrolysis give a large number of monosaccharide molecules. Their general formula is (C6H10O5)n where n = 100 to 3000. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students Glucose is made up of three elements. Which of the following is not one of those elements? PhosphorusCarbonOxygenMore than one of the aboveNone of the above Concept: Carbohydrate: Carbohydrates are primarily produced by plants and form a very large group of naturally occurring organic compounds. Some common examples of carbohydrates are cane sugar, glucose, starch, etc. Monosaccharides: Monosaccharides are simple sugars which cannot be further hydrolysed into simpler forms. Some common examples are glucose, fructose, ribose, etc. Explanation: Glucose: Glucose is an aldohexose and is also known as dextrose. It is the monomer of many of the larger carbohydrates, namely starch, and cellulose. Its molecular formula was found to be C6H12O6, which means glucose is 6 carbon atoms, 12 hydrogen atoms, and 6 oxygen atoms. On prolonged heating with HI, it forms n-hexane, suggesting that all six carbon atoms are linked in a straight chain. Glucose or sucrose are soluble in water. Thus, Glucose is made up of three elements carbon, hydrogen, and oxygen. Phosphorus is not one of those elements. Additional InformationOther monosacarides: Fructose: It is an important ketohexose. It is a natural monosaccharide found in fruits, honey and vegetables. Fructose also has the molecular formula C6H12O6. Galactose: It is a monosaccharide sugar that is 65 per cent sweeter than sucrose and roughly as sweet as glucose. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students Glucose is made up of three elements. Which of the following is not one of those elements? PhosphorusCarbonOxygenMore than one of the above Concept: Carbohydrate: Carbohydrates are primarily produced by plants and form a very large group of naturally occurring organic compounds. Some common examples of carbohydrates are cane sugar, glucose, starch, etc. Monosaccharides: Monosaccharides are simple sugars which cannot be further hydrolysed into simpler forms. Some common examples are glucose, fructose, ribose, etc. Explanation: Glucose: Glucose is an aldohexose and is also known as dextrose. It is the monomer of many of the larger carbohydrates, namely starch, and cellulose. Its molecular formula was found to be C6H12O6, which means glucose is 6 carbon atoms, 12 hydrogen atoms, and 6 oxygen atoms. On prolonged heating with HI, it forms n-hexane, suggesting that all six carbon atoms are linked in a straight chain. Glucose or sucrose are soluble in water. Thus, Glucose is made up of three elements carbon, hydrogen, and oxygen. Phosphorus is not one of those elements. Additional InformationOther monosacarides: Fructose: It is an important ketohexose. It is a natural monosaccharide found in fruits, honey and vegetables. Fructose also has the molecular formula C6H12O6. Galactose: It is a monosaccharide sugar that is 65 per cent sweeter than sucrose and roughly as sweet as glucose. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students In complex carbohydrates, _____ or more sugars bond together in a more complex chemical structure. The correct answer is three.Key Points Complex carbohydrates are made up of many sugar molecules bonded together in a more complex chemical structure. The exact number of sugar molecules in a complex carbohydrate can vary, but it is always more than two. Complex carbohydrates are also known as polysaccharides and are important sources of energy for the body. Examples of complex carbohydrates include starches, glycogen, and cellulose. Additional Information Two sugars bond together in a more complex chemical structure describes a disaccharide, which is a simpler form of carbohydrate than a polysaccharide. Disaccharides are simple sugars that dissolve in water, much like monosaccharides do. Lactose, maltose, and sucrose are three typical examples. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students Which among the following is NOT a disaccharide? LactoseMaltoseSucroseDextroseNot Attempted Concept: Disaccharides: Disaccharides on hydrolysis give two molecules of the same or different monosaccharides. Examples are: Sucrose, maltose, lactose etc. Their general formula is C12H22O11. They may be reducing or non-reducing depending on the position of linkages between the two monosaccharide units. Monosaccharides: These are the simplest carbohydrates that cannot be hydrolyzed into smaller molecules. Their general formula is (CH2O)n where n = 1 to 7. Eg: Ribose, Glucose, Fructose. Explanation: The given carbohydrate molecules are tabulated below: Carbohydrates Other names Chemical formula Source Class of Carbohydrate Lactose Milk sugar C12H22O11 Occurs in milk. Disaccharide Maltose Malt sugar C12H22O11 Obtained by partial hydrolysis of starch by diastase, an enzyme present in malt (sprouted barley seeds). Disaccharide Sucrose Cane sugar C12H22O11 manufactured from sugarcane or beetroot. Disaccharide Dextrose D(+) Glucose / Grape sugar C6H12O6 Present in sweet fruits and honey. Monosaccharide Hence, among the given carbohydrates, Dextrose is NOT a disaccharide. Additional Information Carbohydrates: They play a vital role in our life. Carbohydrates are defined as polyhydroxy aldehydes or polyhydroxy ketones or substance which give these on hydrolysis. They contain at least one asymmetric carbon atom. Classification of Carbohydrates: Carbohydrates are broadly divided into 3 major classes depending on the number of simple sugar units present in their molecule. 1. Monosaccharides 2. Oligosaccharides 3. Polysaccharides Key Points a) Monosaccharides: These are the simplest carbohydrates that cannot be hydrolyzed into smaller molecules. Their general formula is (CH2O)n where n = 1 to 7. Eg: Ribose, Glucose, Fructose. b) Oligosaccharides: These carbohydrates on hydrolysis give 2 to 9 molecules of monosaccharides. Depending on the number of monosaccharide molecules obtained, they are further classified as di, tri, tetrasaccharides, etc. Disaccharides - On hydrolysis gives two molecules of the same or different monosaccharides. Trisaccharides - On hydrolysis gives three molecules of the same or different monosaccharides. Tetrasaccharides - On hydrolysis gives four molecules of the same or different monosaccharides. c) Polysaccharides: They are carbohydrates which on hydrolysis give a large number of monosaccharide molecules. Their general formula is (C6H10O5)n where n = 100 to 3000. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students In complex carbohydrates, _____ or more sugars bond together in a more complex chemical structure. The correct answer is three.Key Points Complex carbohydrates are made up of many sugar molecules bonded together in a more complex chemical structure. The exact number of sugar molecules in a complex carbohydrate can vary, but it is always more than two. Complex carbohydrates are also known as polysaccharides and are important sources of energy for the body. Examples of complex carbohydrates include starches, glycogen, and cellulose. Additional Information Two sugars bond together in a more complex chemical structure describes a disaccharide, which is a simpler form of carbohydrate than a polysaccharide. Disaccharides are simple sugars that dissolve in water, much like monosaccharides do. Lactose, maltose, and sucrose are three typical examples. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students The product obtained when glucose is treated with bromine water is: Saccharic acidSorbitolGluconic acidMannitol Concept: Glucose belongs to a class of aldoses. It contains 6 carbon atoms. Glucose is a carbohydrate belonging to the class of monosaccharides. It can exist in a ring form as well as chain form. The ring form of glucose is known as the pyranose form. There are two forms - α where the -CH2OH group is opposite to the -OH group in C-1 are at opposite sides. β form where the -CH2OH group is opposite to the -OH group in C-1 are on the same sides. Glucose structures are given below: Explanation: Bromine water is an oxidizing agent. The aldehyde group in the glucose is oxidized to the acid group by bromine water. The basic reaction is the conversion of aldoses to aldonic acid. Glucose here is converted to Gluconic acid. This reaction is a characteristic of the aldehyde group present in glucose. The reaction is given as follows: Hence, the product obtained when glucose is treated with bromine water is gluconic acid. Additional Information Glucose in open-chain exists as D form. Glucose in a ring form can also make 5 membered rings which is called its furanose form. D- galactose is an isomer of glucose. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students Which of the following are reducing sugars? I) Sucrose II) Ribose III) Lactose IV) Fructose I, II onlyII, III, IV onlyII, III onlyI, II, IV only Option 2 : II, III, IV only Correct answer: 2) Concept: Any sugar is said to be a reducing sugar if it is capable of acting as a reducing agent because it has a free aldehyde group or a free ketone group. The aldehyde group of aldoses is very susceptible to oxidation, whereas ketoses are less so, but can easily be oxidized if, like fructose, they contain an α-hydroxyl and can tautomerize to an aldose. Most monosaccharides are reducing sugars. This includes all of the common ones galactose, glucose, fructose, ribose, xylose, and mannose. Some disaccharides, such as lactose and maltose are reducing sugars since they have at least one anomeric carbon-free, allowing that part of the sugar to linearize and yield an aldose. Explanation: Sugar is a substance that is crystalline, sweet in taste, and soluble in water. A compound that acts as a reducing agent because of the presence of either ketoses or aldoses group forms a reducing sugar. All monosaccharides (cannot be hydrolyzed further) come under reducing sugar. Disaccharides which have aldehydic and ketonic groups free, act as reducing sugars. Reducing sugars are those species with free - CHO group (I) Sucrose - Non-reducing sugar (II) Ribose - Reducing sugar (III) Lactose - Reducing sugar (IV) Fructose - Reducing sugar Conclusion: Thus, Ribose, Lactose, and Fructose are reducing sugar. India's #1 Learning Platform Start Complete Exam Preparation Daily Live MasterClasses Practice Question Bank Mock Tests & Quizzes Trusted by 7.3 Crore+ Students Biochemistry MCQs - Chapter 2 Books:PDF DownloadeBook Download Apps: The Carbohydrates Multiple Choice Questions (MCQs) with Answers PDF (Carbohydrates MCQs PDF e-Book) download Ch. 2-1 to study Biochemistry Course. 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MCQ: 1 The energy provided by carbohydrates is; approximately 2 Cal/g 4 Cal/g 4.8 Cal/G 3 Cal/g b MCQ: 2 Fructose' and 'Galactose' combines to form; Xylose Lactulose Dextrose Laprose b MCQ: 3 The enzymes that catalyse the epimerization are known as: Isomerase Epimerase Ligase Mediator b MCQ: 4 The elements that are primarily present in the carbohydrates are: Hydrogen Carbon Oxygen All of above d MCQ: 5 Chitin is the derivative of the; Lipid Glucose Steroids Fats b The App: Carbohydrates MCQs App to study Carbohydrates Notes, Biochemistry MCQ App, and Histology MCQs App. The "Car

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