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Class: 12
Subject: chemistry
Topic: Biomolecules
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

1. Identify the one which does not belong to the class to which the other three belong
   A. Glucose
   B. Fructose
   C. Galactose
   D. Maltose

Ans. D

Solution:

Oligosaccharide can contain a maximum of nine monosaccharide units. Cellulose contains a large number of β-D-glucose units

2. Essential amino acids are those which are
   A. essential for the synthesis of proteins
   B. present in traces in proteins
   C. not synthesised in the body
   D. none of the above

Ans. C

Solution:

Out of 20 different amino acids required for protein synthesis 10 of them are not synthesised by the body. Hence they are called essential amino acids. These have to be received in the form of food

3. Proteins full fill several functions in living systems. An example of a protein, which acts as a hormone is
   A. casein
   B. oxytocin
   C. trypsin
   D. keratin

Ans. B

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4. Which of the following does not reduce Benedict's solution
   A. fructose
   B. glucose
   C. aldehyde
   D. sucrose

Ans. D

5. Monosaccharide formed on hydrolysis of starch is
   A. glucose units
   B. glucose units and of fructose units
   C. glucose units and galactose units
   D. fructose unit and of galactose units

Ans. A
Solution:

$$\text{Starch} \xrightarrow{\text{diastase}} \text{Maltose} \xrightarrow{\text{Maltose}} \text{Glucose}$$

6. Egg albumin forms a class of protein called
   A. nucleoprotein
   B. transport agent
   C. simple protein
   D. desired protein

Ans. C

7. **Assertion** All biological systems depend on the availability of free energy in one form or the other.
Reason The inmediate source of free energy in living systems is ATP.
   A. Both (A) and (R) are true and (R) is the correct explanation of (A).
   B. Both (A) and (R) are true but (R) is not the correct explanation of (A).
   C. (A) is true but (R) is false.
   D. (A) is false but (R) is true.

Ans. B

8. At pH = 4 glycine exists as

   A. $H_3\overset{+}{N}-CH_2-COOH$
   B. $H_3\overset{+}{N}-CH_2-COO^-$
   C. $H_2N\text{-}CH_2\text{-}COO^-$
   D. $H_2N\text{-}CH_2\text{-}COOH$

Ans. A

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9. Pyranose ring structure was proposed by
   A. Fisher
   B. Kekule
   C. Haworth
   D. Grignard

Ans. C

10. **Assertion** Enzymes are highly specific in their action, both with respect to the susbstrate they act upon and the kind of reaction they catalyse. **Reason** The "lock and key" hypothesis cannot explain the specificity of enzyme substrate interaction.
   A. Both (A) and (R) are true and (R) is the correct explanation of (A).
   B. Both (A) and (R) are true but (R) is not the correct explanation of (A).
   C. (A) is true but (R) is false.
   D. (A) is false but (R) is true.

Ans. D

11. **Assertion** Man, monkeys and guinea pigs are the only animals sensitive to a lack of this vitamin. **Reason** They do not possess the biosynthetic mechinery for making this vitamin.
   A. Both (A) and (R) are true and (R) is the correct explanation of (A).
   B. Both (A) and (R) are true but (R) is not the correct explanation of (A).
   C. (A) is true but (R) is false.
   D. (A) is false but (R) is true.

Ans. A

12. A certain substance answers Molisch's test as well as Benedict's test but it does not answer Seliwanoff's test. Most probably the compound under consideration is
   A. Protein
   B. Sucrose
   C. Maltose
   D. Fructose

Ans. C

Solution: Fructose is the sweetest of all sugars

13. Sucrose is a

   A. 1, 4-β -glycoside
   B. 1, 4-α -glycoside
   C. 1, 2-β -glycoside
   D. 1, 2-glycoside

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Ans. D

Solution:
In sucrose C1 of a - glucose forms a glycosidic linkage with C^2 of β- fructose. Hence both the functional group are used up.
Hence it is only a 1, 2-glycoside

14. An example of zwitterion is
    A. urea
    B. ammonium acetate
    C. alanine
    D. glycine hydrochloride

Ans. C

Solution: Free amino acid can exist as a Zwitter ion. So option 3 is chosen. Glycine hydrochloride given in option 4 is in. hydrochloric acid medium. Hence it exists as a cation. Options 1 and 2 are not amino acids

15. Saccharification is the process of conversion of
    A. sugar solution into alcohol
    B. alcohol into starch
    C. starch into alcohol
    D. starch into sugar

Ans.d

Solution: Starch is hydrolysed to maltose sugar by the action of enzyme diastase

16. Starting with three different amino acid molecules how many different tripeptide molecules could be formed?
    A. 3
    B. 6
    C. 12
    D. 9

Ans. B
Solution: Let the three amino acids be ABC. Then the six sequence of arrangements are ABC, ACB, BAC, BCA, CAB, CBA

17. Diabetic patients do not take insulin orally because
    A. it is costly
    B. it gets denatured in stomach
    C. it is poison if taken orally
    D. none of these

Ans. B
Solution: In stomach the disulphide linkages of insulin break leading to denaturation. Hense insulin loses the biological activity

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18. Which one of the following is an amino dicarboxylic acid ?
    A. adipic acid
    B. malonic acid
    C. lysine
    D. aspartic acid

Ans. D

Solution: An amino acid containing two - COOH groups is called aminodicarboxylic acid

19. Proteins when heated undergo
    A. activation
    B. denaturation
    C. hydrolysis
    D. polymerization

Ans b

20. Pick out the wrong statement
    A. Glucose is an aldohexose
    B. Fructose is a ketohexose
    C. Ribose is a pento monosaccharide
    D. Cellulose is an oligosaccharide

Ans. B

Solution: Cellulose contains a large number of monosaccharide units while an oligosacch aride must contain 2 to 9monosaccha ride units.

$$CH_3CH_2NH_2 + HNO_2 \longrightarrow CH_3CH_2OH + N_2 + H_2O$$

Ans. D

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