



BIOLOGY

BOOKS - JBD PUBLICATION

BIOMOLECULES

Exercise

1. Living cells contain 60-90% of water. % of water in human body is:

A. 60-65%

B. 50-55%

C. 75-80%

D. 65-70%

Answer:



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2. Which of the following is not an essential fatty acid?

A. Linolenic acid

B. Linoleic acid

C. Arachidonic acid

D. Oleic acid.

Answer:



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3. Most abundant element in living beings is:

A. carbon

B. nitrogen

C. oxygen

D. hydrogen

Answer:



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4. Which among the following is not a lipid?

A. Wax

B. Glycerol

C. Lecithin

D. Sterol.

Answer:



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5. Glucose is a:

A. pyranose pentose sugar

B. furanose pentose sugar

C. aldose hexose sugar

D. ketose hexose sugar

Answer:



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6. Glycosidic bond is broken during the digestion of:

A. lipids

B. proteins

C. starch

D. all of these

Answer:



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7. Lecithin is a

A. glycolipid

B. steroid

C. phospholipid

D. carbohydrate.

Answer:



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8. Lactose molecule is composed of

- A. glucose + glucose
- B. glucose + fructose
- C. glucose + galactose
- D. fructose + fructose.

Answer:



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9. Arachidonic acid is:

- A. non-essential fatty acid.
- B. essential fatty acid
- C. polyunsaturated fatty acid
- D. both (B) and (C).

Answer:



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10. How many molecules of fatty acids occur in a lipid (fat) molecule?

A. One

B. Two

C. Three

D. Four or Five

Answer:



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11. Iodine test is used to detect:

A. fats

B. amino acids

C. carbohydrates

D. typhoid.

Answer:



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12. What is true about glycogen?

A. It is composed of a mixture of different hexoses.

B. It is broken down and synthesized using the same enzymes.

C. It is storage product in animals.

D. It is the sugar of blood.

Answer:



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13. Which of these are not all polysaccharides?

A. Cellulose, glycogen, chitin.

B. Glycogen, amylose, glucose

C. Glycogen, pectin, cellulose

D. Inulin, hemicellulose, glycogen.

Answer:



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14. A fat molecule consists of

- A. fatty acid and glycerol
- B. fatty acid and protein
- C. glycerol and protein
- D. glycerol and mucopolysaccharide.

Answer:



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15. Saturated fatty acids have doubled bonds:

A. 0

B. 1

C. 2

D. 3

Answer:



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16. Which of the following is the most abundant molecule?

A. Glucose

B. Starch

C. Cellulose

D. Ribose.

Answer:



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17. Cellulose is a polymer of:

A. $\alpha - L - glu\cos e$

B. $\alpha - D - glu \cos e$

C. $\beta - D - glu \cos e$

D. fructose

Answer:



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18. Starch and glycogen are both polymers of:

A. mannose

B. $\alpha - glu \cos e$

C. $\beta - glu \cos e$

D. fructose.

Answer:



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19. About 98 per cent of the mass of every living organism is composed of just six elements including carbon, hydrogen, nitrogen, oxygen and:

A. calcium and phosphorous

B. Phosphorus and sulphur

C. Sulphur and magnesium

D. magnesium and sodium.

Answer:



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20. Nitrogenous bases present in DNA:

A. adenine, guanine, cytosine, thymine

B. adenine, guanine, cytosine, uracil

C. adenine, thymine, uracil

D. guanine, uracil

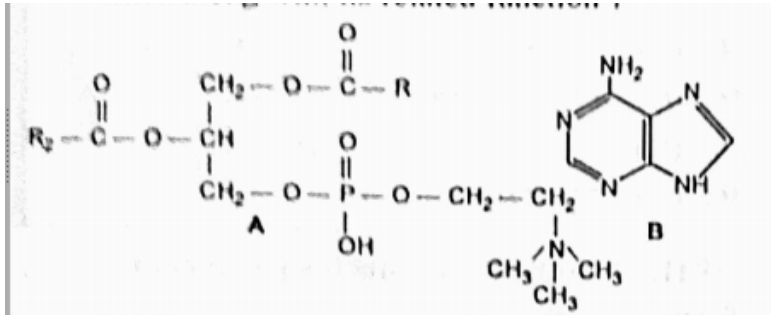
Answer:



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21. Which one of the following structural formulate of two organic compounds is correctly identified along with its related

function?



A. B: adenine- a nucleotide that makes up nucleic acids

B. A: triglyceride- major source of energy

C. B: uracil -a component of DNA

D. A: lecithin-a component of cell membrane.

Answer:



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22. In a polysaccharide, the individual monosacharides are linked by a:

- A. glycosidic bond
- B. peptide bond
- C. ester bond
- D. phosphodiester bond

Answer: hydrogen bond



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23. Formation of both peptide and glycosidic bonds involves:

- A. hydration
- B. dehydration
- C. esterification
- D. acidification.

Answer:



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24. Purines possess nitrogen at:

- A. 1,2,4 and 6 position
- B. 1,3,5 and 7 position
- C. 1,3,7 and 9 position
- D. 1,2,6 and 8 position.

Answer:



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25. Which is not found in RNA?

A. Thymine

B. Uracil

C. Guanine

D. Cytosine

Answer:



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26. Which of the following statements is not correct?

A. Starch is a polymer of α - *glucose*.

B. Starch is made up of amylose and amylopectin

C. Amylose is linear structure consisting of several glucose residues joined by 1,4-glycosidic linkages.

D. Amylopectin is a straight chain with several glucose residues joined only by 1, 4-glycosidic linkages.

Answer:



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27. Macromolecule chitin is:

A. sulphur containing polysaccharide

B. simple polysaccharide

C. nitrogen containing polysaccharide

D. phosphorus containing polysaccharide.

Answer:



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28. Which of the following statements regarding fats is true?

A. Arachidonic acid has 20 carbons excluding the carboxyl carbon.

B. Glycerol is trihydroxy propane

C. palmitic acid has 18 carbons including
the carboxyl carbon

D. Oils have higher melting points than
fats.

Answer: Lipids are generally water soluble.



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29. Which one of the following is a non-reducing carbohydrate?

A. Maltose

B. Sucrose

C. Lactose

D. Ribose-5-phosphate.

Answer:



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30. Which one of the following is a basic amino acid?

A. Lysine

B. Cysteine

C. Alanine

D. Aspartic acid

Answer:



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31. Purine bases of DNA include:

- A. uracil and guanine
- B. guanine and adenine
- C. adenine and cytosine
- D. uracil and thymine

Answer:



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32. Basic unit of nucleic acid is:

- A. nitrogen base
- B. phosphoric acid
- C. pentose sugar
- D. nucleotide

Answer:



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33. Adenine is:

- A. Purine
- B. pyrimidine
- C. nucleotide
- D. nucleoside

Answer:



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34. Nucleotides are made up of:

A. purine+sugar+phosphate

B. pyrimidine+pentose sugar+phosphate

C. purine/pyrimidine+pentose

sugar+phosphate

D. purine+pyrimidine+phosphate

Answer:



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35. The simplest amino acid is:

A. tryptophan

B. valine

C. glycine

D. arginine

Answer:



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36. ATP molecule is:

A. nucleoside

B. nucleosome

C. nucleotide

D. deoxyribose sugar

Answer:



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37. DNA and RNA are similar in that both:

A. have thymidine bases

B. have same pyrimidines

C. have same sugars

D. are nucleotide polymers.

Answer:



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Example

1. Fill in the blanks:

Lipids arein water.



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2. Fill in the blanks:

A true fat with three molecules of fatty acids is called..... .



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3. Fill in the blanks:

Iodine number of fat is used to determine the degree of.....present in fat.



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4. Fill in the blanks:

Starch is the principal.....polysaccharide in plants.



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5. Fill in the blanks:

Starch is a mixture of.....



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6. Fill in the blanks:

Hydrolysis of nucleic acids yield purine,
sugra.....and.....



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7. Fill in the blanks:

DNA hasinstead of uracil.



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8. Fill in the blanks:

Double helical structure is found in..... .



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9. Fill in the blanks:

A nucleotide molecule consists of three smaller molecules: pentose sugar,.....and..... .



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10. Fill in the blanks:

There are two important purines:.....
and..... .



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11. Fill in the blanks

A protein molecule is a polymer of



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12. Fill in the blanks:

The double helix model of DNA was proposed by.....and..... .



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13. Fill in the blanks:

Enzymatic activity stops due to.....of enzymes at very high temperature.



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14. Fill in the blanks:

A compound with almost similar structure to the substrate can act as a



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15. Fill in the blanks:

.....are chemicals which limit or prevent the functioning of an enzyme.



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16. Fill in the blanks:

Enzymes which breakdown compounds without the involvement of water are called..... .



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17. Fill in the blanks:

The function of enzyme is to lower the.....of a biochemical reaction.



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18. Fill in the blanks:

When the production of the cell is inhibited by its own metabolites, this control is called as..... .



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19. Fill in the blanks:

The number of molecules of a substrate acted upon by one molecule of an enzyme per minute is called..... .





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20. Fill in the blanks:

Loss of enzymatic activity of an enzyme due to modification in its physical form is known as..... .



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21. Fill in the blanks:

The molecule on which enzymes act are known as..... .



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22. Fill in the blanks:

Cofactor is often a..... .



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23. What is a cofactor?



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24. What is meant by tertiary structure of proteins?



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25. How many protein forming amino acids occur in nature?



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26. Name the simplest amino acid in which the R-group is a hydrogen.



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27. Name the amino acid having a methyl group as its R-group.



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28. Name the R-group found in the amino acid serine.



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29. Give the structural formula of glycine.



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30. Draw the structure of the amino acid, alanine.



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31. Give the structural formula serine.



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32. How many -COOH groups are found in an acidic amino acid?



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33. How many $-NH_2$ groups are found in a basic amino acid?



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34. Give two example of two acidic amino acids.



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35. Give two example of basic amino acids.



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36. Draw the Zwitterionic form of amino acid.



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37. What is a fatty acid?



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38. How many carbon atoms are found in the arachidonic acid (essential amino acid)?



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39. What is the difference between a saturated and unsaturated fatty acid.



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40. Write the formula of glycerol.



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41. Write the structural formula of palmitic acid, an saturated fatty acid.



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42. What is fat?



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43. Give one example of phospholipids found in cell membranes?



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44. Write the structure of lecithin.



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45. Write the structure of Adenine.



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46. Most abundant element in living beings is:



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47. What are essential amino acids ? Give two examples.



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48. What are non essential amino acids ? Give two examples.



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49. What is the source of essential amino acids.



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50. Name the protein that enables the transport of glucose into cells.



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51. Which protein is the most abundant protein found in the animal world.



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52. Name the protein which is the most abundant protein in the whole of the biosphere.



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53. What is a polysaccharide?



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54. What is a homopolymer?



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55. What is a heteropolymer?



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56. Give two examples of homopolymers.



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57. What are amino acids?



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58. Based on the nature of their R-groups there are many amino acids. Is this statement true?



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59. What are micro biomolecules?



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60. What are macromolecules?



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61. What are carbohydrates?



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62. What are pentoses? Give two examples.



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63. What are polysaccharides ?



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64. Give the examples of two chemically modified amino sugars.



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65. Differentiate between a homopolymer and a heteropolymer.





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66. Monosaccharides are linked by which bond in a polysaccharides?



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67. Discuss structural polysaccharides.



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68. Why starch gives blue colour with Iodine and this reaction is not shown by cellulose?



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69. What are the four substituent groups occupying the four valency positions in an amino acid?



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70. What are essential amino acids ? Give two examples.



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71. What are non essential amino acids ? Give two examples.



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72. Nitrogenous bases found in nucleic acids are.....



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73. What are nucleosides ?



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74. What are primary and secondary metabolites?



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75. What are true fats? Give example.



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76. What is peptide bond and ester bond?



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77. What is protein? Give a brief account.



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78. What are polysaccharides? Describe with the help of a suitable example.



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79. Define the following:

Turn over.



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80. Define the following:

Metabolism.



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81. Define the following:

Enzymes.



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82. Differentiate between anabolic pathways and catabolic pathways.



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83. Explain the statement the living state and metabolism are synonymous.



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84. Describe briefly the effect of temperature and pH on enzyme activity.



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85. Give a brief account of effect of substance concentration on enzyme activity.



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86. What is inhibition? Give a brief account of competitive inhibition with the help of a suitable example.



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87. Describe the mechanism of enzyme action.



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88. Describe characteristics (properties of enzymes).



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89. What are cofactors? Give a brief account of various types of cofactors?



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90. Give a brief account of Watson and Crick model of DNA.



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91. What are macromolecules? Give examples.



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92. What is meant by tertiary structure of proteins?



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93. Find out and make a list of proteins used as therapeutic agents. Find out other application of proteins (e.g. cosmetics, etc).



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94. Proteins have primary structure. If you are given a method to know which amino acid is at either of the two termini (ends) of a protein,

can you connect this information to purity or homogeneity of a protein?



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95. Explain the composition of triglyceride.



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96. Can you describe what happens when milk is converted into curd or yoghurt, from your understanding of proteins.



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97. Can you attempt building models of biomolecules using commercially available atomic models (Ball and Stick models).



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98. Attempt titrating an amino acid against a weak base and discover the number of

dissociating (ionizable) functional groups in the amino acid.



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99. Draw the structure of the amino acid, alanine.



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100. Illustrate a glycosidic, peptide and a phospho-diester bond.



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101. What are gums made of? Is Fevicol different?



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102. Find out a qualitative test for proteins, fats and oils, amino acids and test any fruit juice, saliva, sweat and urine for them.



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103. Find out how much cellulose is made by all the plants in the biosphere and compare it with how much of paper is manufactured by man and hence what is the consumption of plant material by man annually. What a loss of vegetation!



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104. Describe the important properties of enzymes.



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