

SOLUTIONS

Unit 2: Biological Molecules

2.1: Testing for biological molecules

- C**
Solution 2, which turns red after acid hydrolysis, contains sucrose as it breaks down into reducing sugars. Solution 3, turning purple in the biuret test, indicates the presence of amylase (a protein).
- C**
The correct procedure involves first boiling the sample with dilute hydrochloric acid to hydrolyze non-reducing sugars, neutralizing with sodium hydrogen carbonate, and then performing the Benedict's test to detect reducing sugars.
- B**
Tay-Sachs disease is caused by a malfunction in the lysosome, which is responsible for breaking down lipids. In this disease, lipids accumulate due to lysosomal dysfunction.
- B**
Goblet cells secrete mucus and have extensive Golgi bodies to modify, package, and transport the proteins and lipids used in secretion.
- C**
Circle 1 represents prokaryotes, which contain circular DNA (2). Circle 3 is mitochondria, which also contain circular DNA (4). Circle 5 is chloroplasts, which share these structures with mitochondria and prokaryotes. Hence, row C is correct.
- C**
Animal cells contain linear DNA. Prokaryotic DNA is not surrounded by a double membrane but is double-stranded.
- D**
Guanine is present in both DNA and RNA, which are found in all viruses, whereas uracil, ribose, and thymine are specific to either RNA or DNA.
- C**
After a negative Benedict's test (blue), the sample is boiled with dilute hydrochloric acid to hydrolyze non-reducing sugars. It is then neutralized with sodium hydrogencarbonate before repeating the Benedict's test.
- D**
The emulsion test for lipids involves adding ethanol and water to a sample, and if lipids are present, a milky emulsion will form. Boiling is not part of this test.
- B**
Sample one initially tested negative for reducing sugars with Benedict's solution, but after breaking down non-reducing polysaccharides with acid and base, it tested positive, indicating the presence of reducing sugars. This is because glycosidic bonds in polysaccharides were broken down to release reducing sugars.