

SECTION A

Biology: 16 questions, 30 marks

Multiple-choice questions 1 to 7 carry 1 mark each, assertion–reason questions 8 and 9 carry 1 mark each, then 2, 3, 4 and 5 mark questions.

1. During photosynthesis, the oxygen that is released comes from:

- A chlorophyll
- B water
- C carbon dioxide
- D glucose

2. Bile juice, secreted by the liver, helps in digestion because it:

- A makes the stomach contents more acidic
- B digests proteins into amino acids
- C converts starch into maltose
- D breaks large fat globules into smaller droplets and makes the food in the small intestine alkaline

3. In the human kidney, the filtration of blood to form the initial filtrate takes place in the:

- A ureter
- B collecting duct
- C urinary bladder
- D glomerulus (inside Bowman's capsule)

THE WORKED ANSWERS TO THOSE 3 QUESTIONS

1. During photosynthesis, the oxygen that is released comes from: [Photosynthesis]

Correct answer: B — water

- Light energy splits water molecules (photolysis) in the chloroplast: $2\text{H}_2\text{O} \rightarrow 4\text{H} + \text{O}_2$.
- The hydrogen reduces CO_2 to carbohydrate; the oxygen is released.
- So the oxygen released comes from water.
- Why the other options are wrong:
- A (chlorophyll): Chlorophyll absorbs light; it is not split to release oxygen.
- C (carbon dioxide): Carbon dioxide supplies the carbon that ends up in glucose; the oxygen released comes from splitting water.
- D (glucose): Glucose is a product that stores the carbon, not the source of oxygen.

LOS: Life processes

KEY TAKEAWAY

Photolysis of water in the light reaction releases oxygen; CO_2 is the source of carbon.

2. Bile juice, secreted by the liver, helps in digestion because it: [Nutrition]

Correct answer: D — breaks large fat globules into smaller droplets and makes the food in the small intestine alkaline

- Food coming from the stomach is acidic; bile makes it alkaline so that pancreatic enzymes can act.
- Bile salts emulsify fats, breaking big globules into tiny droplets so that lipase can act on a larger surface area.
- Bile has no digestive enzymes.
- Why the other options are wrong:
- A: Bile is alkaline and acts in the small intestine, not the stomach.
- B: Proteins are digested by pepsin and trypsin; bile contains no enzymes.
- C (converts starch into maltose): Starch is digested by amylase; bile has no enzyme action.

LOS: Life processes

KEY TAKEAWAY

Bile emulsifies fats and makes the intestinal medium alkaline; it contains no enzymes.

3. In the human kidney, the filtration of blood to form the initial filtrate takes place in the:
[Excretion]

Correct answer: D — glomerulus (inside Bowman's capsule)

- Blood enters the glomerulus, a cluster of capillaries inside Bowman's capsule.
- Small molecules (water, glucose, salts, urea) filter into the capsule; this is the initial filtrate.
- Reabsorption of useful substances then happens in the tubule.
- Why the other options are wrong:
 - A (ureter): The ureter carries urine from the kidney to the bladder.
 - B (collecting duct): The collecting duct collects urine; it does not filter blood.
 - C (urinary bladder): The bladder only stores urine.

LOS: Life processes

KEY TAKEAWAY

Filtration occurs in the glomerulus; reabsorption occurs along the tubule.