

Human nutrition practice questions

25 questions • 71 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 71

Diet **Spec 7.1**

- 1** A sailor has no fresh fruit or vegetables in his diet for several months. His gums bleed and his wounds heal slowly. Which deficiency disease does he have? **[1 mark]**

- A. ☐ Anaemia
B. ☐ Rickets
C. ☐ Scurvy
D. ☐ Obesity

- 2** Name the nutrient that is needed for each of the following uses in the body. (a) Growth **[3 marks]**
and repair of tissues (b) Making haemoglobin (c) Providing insulation and an energy store

- 3** Describe what is meant by a balanced diet. **[2 marks]**

- 4 Complete the table by stating one dietary source and one importance for each nutrient. [4 marks]

Nutrients		
Nutrient	Dietary source	Importance
Calcium		
Fibre		

- 5 (a) State the cause of scurvy. [1] (b) State one food that would help to prevent scurvy. [1] (c) [4 marks]
Rickets is a disease of the bones in children. Explain how a lack of vitamin D can cause rickets. [2]

- 6 Which statement about nutrients is correct? [1 mark]
- A. ☐ Vitamin D helps the absorption of calcium
- B. ☐ Iron is needed to make bones
- C. ☐ Water provides energy
- D. ☐ Protein provides insulation

The digestive system Spec 7.2, 7.3

- 7 In which organ is bile stored? [1 mark]
- A. ☐ Liver
- B. ☐ Pancreas
- C. ☐ Gall bladder
- D. ☐ Duodenum

8 Complete the table to show the function of each organ.

[4 marks]

Organs of the digestive system	
Organ	Function
Salivary glands	
Liver	
Colon	
Anus	

9 Define each term. (a) ingestion (b) absorption (c) assimilation

[3 marks]

10 Which type of tooth is used mainly for biting and cutting food?

[1 mark]

- A. ☐ Canine
- B. ☐ Incisor
- C. ☐ Molar
- D. ☐ Premolar

11 A section through a tooth shows enamel, dentine, pulp and cement. State the part of the tooth that (a) is the hardest outer covering of the crown [1] (b) contains nerves and blood vessels [1] (c) fixes the tooth into the jawbone [1] (d) is the hard, bone-like material under the enamel [1]

[4 marks]

- 12** (a) Describe how the stomach carries out physical digestion. [2] (b) Explain why physical digestion helps chemical digestion. [1] (c) State one function of hydrochloric acid in the stomach. [1] **[4 marks]**

- 13** **Supplement** **[3 marks]**
Outline the role of bile in the digestion of fats and oils.

Chemical digestion Spec 7.4

- 14** Which shows the products of the digestion of fats and oils by lipase? **[1 mark]**

- A. ☐ Amino acids
B. ☐ Fatty acids and glycerol
C. ☐ Simple reducing sugars
D. ☐ Maltose and glucose

- 15** (a) Describe what is meant by chemical digestion. [2] (b) Explain why the products of chemical digestion can be absorbed into the blood. [1] **[3 marks]**

16 Complete the table for the three digestive enzymes.

[6 marks]

Digestive enzymes			
Enzyme	Substrate	Product	Where secreted
Amylase			
Protease			
Lipase			

17 Describe two functions of hydrochloric acid in gastric juice.

[2 marks]

18 **Supplement**

[4 marks]

Describe the digestion of starch in the digestive system.

19 **Supplement** **[5 marks]**

(a) Name the protease that works in the stomach. [1] (b) Explain why the same protease does not work in the small intestine. [2] (c) Name the protease that works in the small intestine and state the pH conditions it needs. [2]

20 **Supplement** **[1 mark]**

Acidic food and gastric juice enter the duodenum from the stomach. Which substance makes the contents of the duodenum suitable for enzymes to work?

- A. ☐ Amylase
- B. ☐ Hydrochloric acid
- C. ☐ Bile
- D. ☐ Glycerol

Absorption Spec 7.5

21 In which region of the digestive system are nutrients absorbed? **[1 mark]**

- A. ☐ Oesophagus
- B. ☐ Small intestine
- C. ☐ Rectum
- D. ☐ Mouth

22 State where water is absorbed in the digestive system. **[2 marks]**

23 **Supplement** **[3 marks]**

Explain the significance of villi and microvilli in the small intestine.

24

Supplement

[4 marks]

Describe the structure of a villus.

25

Supplement

[4 marks]

(a) State what is absorbed into the capillaries of a villus. [2] (b) Name the vessel in the centre of a villus that absorbs the products of fat digestion, and name these products. [2]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

C C (scurvy)

2. [3]

- (a) protein (1)
- (b) iron (1)
- (c) fat(s) / oil(s) (1) allow lipid(s)

3. [2]

- contains all the nutrients / carbohydrates, fats, proteins, vitamins, minerals, fibre and water (1)
- in the correct proportions / amounts (1)
- gives the right amount of energy for the person's needs / age, sex, activity (1)
- Max 2

4. [4]

- calcium source: milk / cheese / yoghurt / dairy foods (1)
- calcium importance: making bones and teeth / strong or hard bones and teeth (1)
- fibre source: wholemeal bread / vegetables / fruit / cereals (1)
- fibre importance: provides bulk for muscles of gut to push food along / prevents constipation (1)

5. [4]

- (a) lack of / not enough vitamin C (1)
- (b) citrus fruit / orange / lemon / fresh vegetables / fresh fruit (1)
- (c) vitamin D helps absorb calcium (1)
- calcium needed to harden bones / without calcium the bones are soft (and bend) (1)

6. [1]

A A

7. [1]

C C (gall bladder)

8. [4]

- salivary glands: make / secrete saliva / amylase (1)
- liver: makes bile (1) allow assimilation / uses absorbed nutrients, e.g. amino acids to make proteins
- colon: absorbs water (1)
- anus: egestion / faeces leave the body (1)

9. [3]

- (a) the taking of substances, e.g. food and drink, into the body (1)
- (b) the movement of nutrients from the intestines into the blood (1)
- (c) uptake and use of nutrients by cells (1)

10. [1]

B B (incisor)

11. [4]

- (a) enamel (1)
- (b) pulp (1) allow pulp cavity
- (c) cement (1)
- (d) dentine (1)

12. [4]

- (a) muscular walls contract / relax / churn the food (1)
- mixes food with gastric juice / breaks it into smaller pieces (1)
- (b) increases the surface area of the food for enzymes to act on (1)
- (c) kills harmful microorganisms / provides an acidic pH for optimum enzyme activity (1)

13. [3] Supplement

- emulsifies fats and oils / breaks large drops into smaller droplets (1)
- increases the surface area (1)
- for lipase / enzyme (chemical digestion) to act on (1)
- reject bile digests fat / bile is an enzyme

14. [1]

B B

15. [3]

- (a) breakdown of large molecules (1)
- insoluble molecules into small soluble molecules (1)
- (b) they are small and soluble / can pass through the gut wall (1)

16. [6]

- amylase: starch (1)
- amylase: simple (reducing) sugars (1) allow maltose; ignore sugar unqualified
- amylase: salivary glands / pancreas (1)
- protease: protein and amino acids (1)
- protease: stomach / pancreas (1)
- lipase: fats and oils and fatty acids and glycerol (1)
- lipase: pancreas (1)
- Max 6

17. [2]

- kills harmful microorganisms / bacteria in food (1)
- provides an acidic pH for optimum enzyme (protease / pepsin) activity (1)

18. [4] Supplement

- amylase (from salivary glands / pancreas) (1)
- breaks starch down to maltose (1)
- maltase breaks maltose down to glucose (1)
- maltase is on the membranes of epithelium lining the small intestine (1)

19. [5] Supplement

- (a) pepsin (1)
- (b) stomach is acidic, small intestine is alkaline (1)
- pepsin works (best) in acidic conditions / alkaline pH is not its optimum (1) allow pepsin is denatured in alkaline conditions
- (c) trypsin (1)
- alkaline (conditions) (1)

20. [1] Supplement

C C (bile; it is alkaline and neutralises the acid)

21. [1]

B B (small intestine)

22. [2]

- most in the small intestine (1)
- some in the colon / large intestine (1)

23. [3] Supplement

- increase the (internal) surface area (1)
- microvilli on the epithelial cells of each villus increase the area further (1)
- for absorption of (digested) nutrients (into the blood) (1)
- so absorption is faster / more is absorbed in a given time (1)
- Max 3

24. [4] Supplement

- finger-like projection (1)
- wall is one cell thick / thin epithelium (1)
- surface cells have microvilli (1)
- network of capillaries (1)
- lacteal in the centre (1)
- Max 4

25. [4] Supplement

- (a) glucose (1)
- amino acids (1) allow vitamins / mineral ions / water
- (b) lacteal (1)
- fatty acids and glycerol (1)