Mark each point independently. Accept alternative correct responses. Underlined words are required. [1] per bullet point unless stated. ★ = Higher Tier only.

Question 1 [0 marks]

Context: Each food sample was tested using four different reagents. The results are recorded below....

Q: A student tests four unknown food samples (A, B, C, D) for the presence of starch, glucose, protein and lipid. The table...

[0 marks]

Question 2 [3 marks]

Q: Using the results table, identify which food molecules are present in sample B.

- Glucose (reducing sugar) — Benedict's test gave brick red result [1]
- Protein — biuret test gave purple result [1]
- Lipid — ethanol emulsion test gave milky white result [1]

[3 marks]

Question 3 [3 marks]

Q: A student says: "Sample A must contain only starch." Evaluate this claim.

- The student is partially correct — sample A tested positive for starch (iodine turned blue-black) [1]
- However, absence of a positive result does not prove the food molecule is absent — the sample may contain protein/glucose below the detection threshold [1]
- The claim is an over-simplification — we can only say no glucose, protein or lipid was detected, not that they are definitively absent [1]

Note: Accept any valid evaluative point with appropriate justification.

[3 marks]

Question 4 [4 marks]

Q: Describe how the student would carry out the Benedict's test for glucose. Include what a positive result looks like.

- Add 2 cm^3 of food sample to a test tube [1]
- Add 2 cm^3 of Benedict's solution to the test tube [1]
- Heat the test tube in a water bath at approximately 80°C for 5 minutes [1]
- Positive result: solution turns brick red / orange / green / yellow (any colour change from blue) [1]

[4 marks]

Question 5 [2 marks]

Q: Explain why the Benedict's test must be heated but the iodine test does not require heating.

- The Benedict's reaction requires energy / heat to proceed — the copper ions need thermal energy to react with the reducing sugar [1]
- Iodine and starch react at room temperature — iodine molecules interact physically with the coiled starch structure without requiring energy [1]

[2 marks]

END OF QUESTIONS — Total: 12 marks