2025 Bi H1 Q7

Section: Metabolism and Survival

Topic: Metabolic Pathways

Question Summary:

You are asked which list contains only **proteins embedded in membranes**.
The options mix membrane proteins with proteins located elsewhere in the cell.

Worked Solution:

- Proteins embedded in membranes must span or be inserted into the lipid bilayer.

Check each protein type:
• **Pores (channel proteins)** — membrane proteins that allow molecules to pass.
• **Pumps** — membrane proteins that transport substances using ATP.
• **ATP synthase** — located in mitochondrial and chloroplast membranes.
• **Enzymes** — most are soluble and not membrane■bound (unless specified).
• **Histones** — found in the nucleus, associated with DNA; not membrane proteins.

Now assess each option:
- **A**: Pore ✔, histone ✘, enzyme (not specifically membrane) ✘
- **B**: Enzyme ✘, pump ✔, histone ✘
- **C**: Pore ✔, ATP synthase ✔, pump ✔ → all membrane proteins
- **D**: Histone ✘, pump ✔, ATP synthase ✔

Only option **C** lists three proteins that are all embedded in

membranes.

Final Answer: C

Revision Tips:

- Pores, pumps and ATP synthase are classic examples of **membrane proteins**.
- Histones are always nuclear; if you see “histone”, eliminate that option.
- Many enzymes are soluble — only treat them as membrane proteins if explicitly stated.