2021 Ph H1 Q3

Section: Our Dynamic Universe
Topic: Motion, Equations and Graphs

Question Summary

From the velocity-time graph, find:

- The **acceleration** during 8.0 s

- The **displacement** of the object at 8.0 s.

✅ Final Answer:

A. −0.63 m s⁻², 100 m

Working

1. Acceleration

$$a = \frac{v - u}{t} = \frac{10 - 15}{8} = \frac{-5}{8} = -0.63 \, \text{ms}^{-2}.$$

2. Displacement
The displacement is the **area under the v–t graph:**

- Rectangle area: $10 \, \text{ms}^{-1} \times 8 \, \text{s} = 80 \, \text{m}.$

- Triangle area: $\frac{1}{2} \times (15 - 10) \, \text{ms}^{-1} \times 8 \, \text{s} = 20 \, \text{m}$.

Total displacement:
$s = 80 + 20 = 100 \, \text{m}.$

Quick Tips

- Acceleration = gradient of a velocity-time graph.

- Displacement = total area under the graph.

- Split the area into simple shapes (rectangle + triangle).

↓