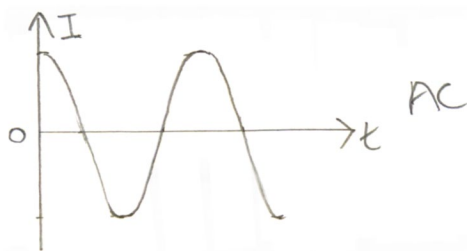


Question			Expected response	Max mark	Additional guidance
13.	(a)		(An alternating current) <u>changes direction and</u> (instantaneous) <u>value with time.</u>	1	
	(b)	(i)	$(V_{peak} = 5.0 \times 3)$ $V_{peak} = 15 \text{ V}$	1	
		(ii)	$(T = 1.0 \times 10^{-3} \times 4 = 4.0 \times 10^{-3} \text{ s})$ $f = \frac{1}{T} \text{ (1)}$ $f = \frac{1}{4.0 \times 10^{-3}} \text{ (1)}$ $f = 250 \text{ Hz (1)}$	3	
	(c)		Same frequency and peak voltage (1) Trace shows 'half-wave rectification' (1)	2	Positive or negative half of the cycle accepted.

Q13(a) Maximum mark: 1**Response A****Marks****Response B**

alternating current changes
direction. Direct current flows in
the same one direction all the time

Response C

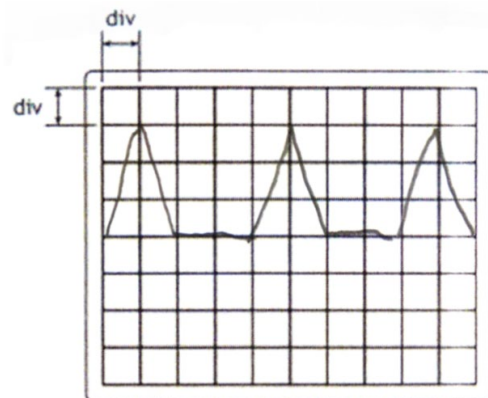
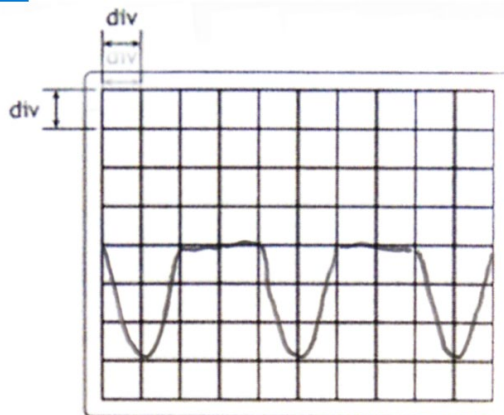
AC CHANGES DIRECTION WITH TIME

Q13(b)(ii) **Maximum mark: 3****Response A**

$$T = \frac{1}{f}$$
$$f = ? \quad f = \frac{1}{0.4}$$
$$T = 0.4 \quad f = 2.5 \text{ Hz}$$
$$f = \frac{1}{T}$$

Marks**Response B**

$$4 = T$$
$$T = \frac{1}{f}$$
$$4 = \frac{1}{f}$$
$$f = 0.25 \text{ Hz}$$

Q13(c) Maximum mark: 2**Response A****Marks****Response B**

13(a)	A	1	1	The candidate has satisfactorily stated what is meant by AC in diagrammatical form.
	B	1	0	The candidate's statement does not refer to change in direction and value with time.
	C	1	0	The candidate's statement does not refer to change in value with time.
13(b)(ii)	A	3	1	The candidate has selected an appropriate relationship but has not correctly substituted values (0.4 rather than 4×10^{-3}).
	B	3	2	The candidate has selected an appropriate relationship and has correctly substituted values, assuming T in milliseconds. The unit in the final answer, however, is not consistent with this assumption, and so the mark allocated to the final answer is not awarded.
13(c)	A	2	1	The trace drawn by the candidate shows the same frequency and peak voltage but is not sufficiently sinusoidal to show half-wave rectification of the given trace.
	B	2	2	The trace drawn by the candidate shows the same frequency and peak voltage and shows half-wave rectification of the given trace.