

*16(c)

- This question assesses a student's ability to show a coherent and logically structured answer with linkages and fully-sustained reasoning.
- Marks are awarded for indicative content and for how the answer is structured and shows lines of reasoning.
- The following table shows how the marks should be awarded for indicative content.

Number of indicative marking points seen in answer	Number of marks awarded for indicative marking points
6	4
5–4	3
3–2	2
1	1
0	0

- The following table shows how the marks should be awarded for structure and lines of reasoning.

	Number of marks awarded for structure of answer and sustained line of reasoning
Answer shows a coherent and logical structure with linkages and fully sustained lines of reasoning demonstrated throughout	2
Answer is partially structured with some linkages and lines of reasoning	1
Answer has no linkages between points and is unstructured	0

Total marks awarded is the sum of marks for indicative content and the marks for structure and lines of reasoning

Indicative content

- For long(er) wire, the extension will be large(r)
- (For the same load) extension is proportional to the original length

Or $\frac{\text{extension}}{\text{original length}} = \text{constant}$

- For a thin(ner) wire, the extension will be large(r)
- (For the same load) extension is inversely proportional to cross-sectional area (may be explained in terms of E , σ and ϵ)
- The percentage uncertainty in the extension/length will be lower (although this will be greater for the cross-sectional area)
- A small(er) load can be used with a long/thin wire

[For 1 linkage mark there must be 3 IC points to include either IC1 **and** IC2/IC5 **Or** IC3 **and** IC4/IC5
For 2 linkage marks there must be at least 5 IC points including IC1 **and** IC2/IC5 and IC3 **and** IC4/IC5]

Total for question 16

6

13

Question Number	Answer	Mark																				
*14	<p>This question assesses a student's ability to show a coherent and logically structured answer with linkages and fully-sustained reasoning.</p> <p>Marks are awarded for indicative content and for how the answer is structured and shows lines of reasoning.</p> <p>The following table shows how the marks should be awarded for indicative content.</p> <table><tr><th>Number of indicative marking points seen in answer</th><th>Number of marks awarded for indicative marking points</th></tr><tr><td>6</td><td>4</td></tr><tr><td>5-4</td><td>3</td></tr><tr><td>3-2</td><td>2</td></tr><tr><td>1</td><td>1</td></tr><tr><td>0</td><td>0</td></tr></table> <p>The following table shows how the marks should be awarded for structure and lines of reasoning.</p> <table><tr><th></th><th>Number of marks awarded for structure of answer and sustained line of reasoning</th></tr><tr><td>Answer shows a coherent and logical structure with linkages and fully sustained lines of reasoning demonstrated throughout</td><td>2</td></tr><tr><td>Answer is partially structured with some linkages and lines of reasoning</td><td>1</td></tr><tr><td>Answer has no linkages between points and is unstructured</td><td>0</td></tr></table> <p>Indicative content</p> <ul style="list-style-type: none">• Minimum / threshold frequency required to release electrons.• For waves, any frequency would be able to release electrons.• Release of electrons is instantaneous.• If the wave model were correct, (energy) would take time to build up before electrons were released.• (Kinetic) energy of released electrons dependent on frequency.• If the wave model were correct, the (kinetic) energy of the released electrons would be dependent on the intensity.	Number of indicative marking points seen in answer	Number of marks awarded for indicative marking points	6	4	5-4	3	3-2	2	1	1	0	0		Number of marks awarded for structure of answer and sustained line of reasoning	Answer shows a coherent and logical structure with linkages and fully sustained lines of reasoning demonstrated throughout	2	Answer is partially structured with some linkages and lines of reasoning	1	Answer has no linkages between points and is unstructured	0	6
Number of indicative marking points seen in answer	Number of marks awarded for indicative marking points																					
6	4																					
5-4	3																					
3-2	2																					
1	1																					
0	0																					
	Number of marks awarded for structure of answer and sustained line of reasoning																					
Answer shows a coherent and logical structure with linkages and fully sustained lines of reasoning demonstrated throughout	2																					
Answer is partially structured with some linkages and lines of reasoning	1																					
Answer has no linkages between points and is unstructured	0																					
	Total for question 14	6																				