

7	The only correct answer is D (π) A is not correct because path difference is 1 m which is half a wavelength so waves are in antiphase with phase difference π B is not correct because path difference is 1 m which is half a wavelength so waves are in antiphase with phase difference π C is not correct because path difference is 1 m which is half a wavelength so waves are in antiphase with phase difference π	1
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9	The only correct answer is C time between consecutive pulses is too short The next pulse would be transmitted before the previous pulse is received	1
	<i>A is not correct because it is not significant</i> <i>B is not correct because it is not significant</i> <i>D is not correct because it is not significant</i>	

5	The only correct answer is A - the number of conduction electrons decreases so the ammeter reading decreases. B is not correct because the current would decrease. C is not correct because the number of conduction electrons would decrease. D is not correct because the number of conduction electrons would decrease, and the current would decrease.	1
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2	D is the correct answer A is not correct because the electrons need to move to lower energy levels and emit photons. B is not correct because the electrons need to move to lower energy levels. C is not correct because the electrons need to emit photons.	1
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2	The only correct answer is C (All the light is reflected) A is not correct because none of the light will be refracted B is not correct because none of the light will be transmitted D is not correct because all the light will be reflected and none transmitted.	1
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2	The only correct answer is D A is not correct because amplitude can be read from the graph B is not correct because frequency is the reciprocal of time period C is not correct because time period can be read from the graph	1
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2	C is the correct answer A is not the correct answer as the intensity does not vary as the filter is rotated B is not the correct answer as the intensity does not vary as the filter is rotated D is not the correct answer as one filter will allow some oscillations to pass	(1)
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10

The only correct answer is C

1

A is not correct because reflection is the correct answer

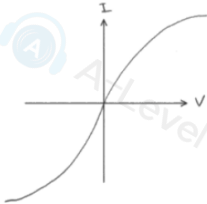
B is not correct because diffraction is not relevant in this context

D is not correct because reflection is the correct answer

Question
Number

Answer

Mark

19(a)	<table><tr><td colspan="3">B is brighter and A is dimmer</td></tr><tr><td>$P = \frac{V^2}{R}$</td><td>$P = I^2 R$</td><td>$P = VI$</td></tr><tr><td>Resistance of parallel combination decreases</td><td>Resistance in parallel/circuit decreases</td><td>Resistance in circuit decreases</td></tr><tr><td>p.d. across B increases Or p.d. across A (or C) decreases</td><td>Current (in circuit/B) increases</td><td>Current (in circuit) increases</td></tr><tr><td>p.d. across A = p.d. across C</td><td>Current shared (equally) between A and C</td><td>Current shared (equally) between A and C</td></tr><tr><td colspan="3">(So) A and C are the same brightness (as each other)</td></tr></table>	B is brighter and A is dimmer			$P = \frac{V^2}{R}$	$P = I^2 R$	$P = VI$	Resistance of parallel combination decreases	Resistance in parallel/circuit decreases	Resistance in circuit decreases	p.d. across B increases Or p.d. across A (or C) decreases	Current (in circuit/B) increases	Current (in circuit) increases	p.d. across A = p.d. across C	Current shared (equally) between A and C	Current shared (equally) between A and C	(So) A and C are the same brightness (as each other)			(1) (1) (1) (1) (1) (1)	6
B is brighter and A is dimmer																					
$P = \frac{V^2}{R}$	$P = I^2 R$	$P = VI$																			
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19(b)(i)	Correct curve in + + section Symmetrical negative curve (consistent with their ++ curve) 	(1) (1)	2																		
19(b)(ii)	Temperature increases with increasing current or potential difference (with temperature increase) there is an increase in ion/atom vibrations Greater rate of collisions between electrons and ions/atoms/lattice (causing an increase in resistance) The rate of increase of current with p.d. decreases	(1) (1) (1) (1)	4																		
Total for question 19			12																		

17(a)	Each point on a <u>wavefront</u> is (treated as) a source of (secondary) <u>wavelets</u> these further wave (let)s interfere / superpose (and the resulting waves predict the shape)	(1) (1)	2
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***17(b)**

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.

IC points	IC mark	Max linkage mark	Max final mark
6	4	2	6
5	3	2	5
4	3	1	4
3	2	1	3
2	2	0	2
1	1	0	1
0	0	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

Indicative content

IC1 Waves (from each gap) interfere / superpose

IC2 At position A there is no path / phase difference

IC3 So, there is constructive interference (leading to large amplitude oscillations)

IC4 At position B, the phase difference varies with wavelength

IC5 If there is an odd number of half wavelengths path difference, there is destructive interference leading to small oscillations

Or If the waves are in antiphase there is destructive interference leading to small oscillations

IC6 And if there is a whole number of wavelengths path difference there is constructive interference leading to large oscillations

Or If the waves are in phase there is constructive interference leading to large oscillations

Total for question 17

6

8