M1. The mark scheme gives some guidance as to what statements are expected to be seen in a 1 or 2 mark (L1), 3 or 4 mark (L2) and 5 or 6 mark (L3) answer. Guidance provided in section 3.10 of the 'Mark Scheme Instructions' document should be used to assist in marking this question.

Mark	Criteria	QoWC	
6	All three aspects (physical, interference and signal carrying properties) covered: A clear discussion of the advantages / disadvantages of the two systems in terms of weight (and in some cases cost). There may also be a suggestion that optical fibres are harder to join together. A comparison of their relative vulnerability to external interference and security. A comparison of the two systems in terms of signal degredation, bandwidth and speed of transmission.	The student presents relevant information coherently, employing structure, style and sp&g to render meaning clear. The text is legible.	
5	Two of the three aspects fully covered, with some detail missing from the third.		
4	One aspect fully covered, with some detail missing from the other two Or Two aspects fully covered, with little or no relevant information about the third.	The student presents relevant information and in a way which assists the communication of meaning. The text is legible. Sp&g are sufficiently accurate not to obscure meaning.	
3	All three aspects partially covered, with some detail missing from each		

	Or One aspect fully covered, with little or no relevant information about the other two		
2	Two aspects partially covered, with little or no relevant information about the third.	The student presents some relevant information in a simple form. The text is usually legible. Sp&g allow meaning to be derived although errors are sometimes obstructive.	
1	One aspect partially covered, with little or no relevant information about the other two.		
0	Little or no relevant information about any of the three aspects.	The student's presentation, spelling punctuation and grammar seriously obstruct understanding.	

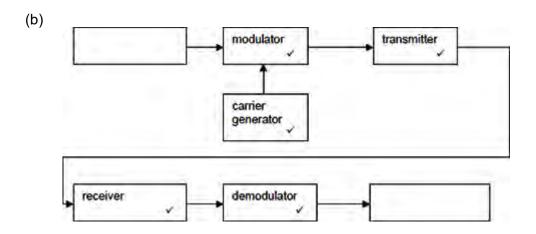
		copper	optic fibre
Physical	corrosion	Will corrode unless well-protected	Glass doesn't corrode
	weight / cost etc	Copper heavier / more expensive / easy to join	Thinner and less expensive. Harder to join
External interference	security	Can be 'tapped' without breaking cable	Cannot be tapped (unless cable broken into)
	electromagnetic interference	Can pick up noise / cross talk	Immune from noise / can be used in 'noisy' environments
Signal carrying properties	signal degradation / attenuation	High attenuation	Low attenuation but pulses can suffer smearing

bandwidth / info carrying capacity	Relatively low / fewer channels	greater info-carrying capacity / more channels / possibility of sending more than one signal on optic fibre eg data + talk
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[6]

- **M2.**(a) (any order)
 - 1 free space ✓
 - 2 wires (twisted pair, coaxial etc.) ✓
 - 3 fibre ✓

3



[8]

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