

# **Additional Applied Science A**

General Certificate of Secondary Education

Unit **A326/02**: Communication

## **Mark Scheme for January 2011**

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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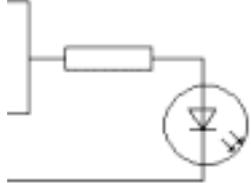
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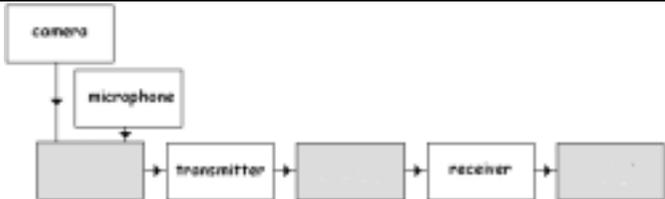
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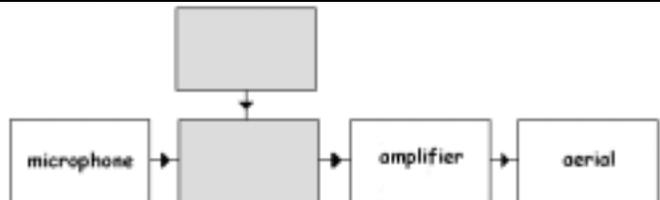
- 1 Abbreviations, annotations and conventions used in the detailed mark scheme:
- / = alternative and acceptable answers for the same marking point
  - (1) = separates marking points
  - not/reject** = answers which are not worthy of credit
  - ignore** = statements which are irrelevant - applies to neutral answers
  - allow/accept** = answers that can be accepted
  - (words) = words which are not essential to gain credit
  - words = underlined words must be present in answer to score a mark
  - ecf = error carried forward
  - AW/owtte = alternative wording
  - ORA = or reverse argument

Question		Expected Answers	Marks	Additional Guidance
1	(a)		[1]	ring must only be around LED <b>accept</b> any unambiguous correct response
	(b)	use a voltmeter / multimeter / oscilloscope; (1) connect (probes) to either side of resistor; (1)	[2]	<b>accept</b> meter <b>accept</b> across / in parallel with resistor  <b>accept</b> a drawing on the figure correct symbol for voltmeter (1) correct connection to either side of 340 Ω resistor (1)
	(c)	0.02 A;	[1]	
	(d)	<b>any of the following:</b> <ul style="list-style-type: none"> <li>so that it doesn't get damaged / break;</li> <li>so that it doesn't get hot;</li> <li>so that it doesn't burn anyone;</li> <li>to check this is less than power rating;</li> </ul>	[1]	
	(e)	same chip can be used in many different circuits;	[1]	<b>accept</b> chip behaviour can be changed <b>accept</b> cheap chip because so many made <b>accept</b> one chip replaces many components <b>accept</b> same circuit board for many different circuits
<b>Total</b>			[6]	

Question		Expected Answers	Marks	Additional Guidance
2	(a)		[2]	camera and microphone correct (1) transmitter and receiver correct (1)  <b>accept</b> camera swapped for microphone

	(b)	<b>any of the following:</b> <ul style="list-style-type: none"> <li>select/direct cameras or microphones;</li> <li>cut out unwanted parts;</li> <li>select parts to transmit;</li> <li>add subtitles / titles;</li> <li>insert adverts;</li> <li>adjust sound levels / colour balance;</li> <li>add music / voice to video signal;</li> </ul>	[1]	<b>not</b> anything done by sound recorders, camera operators <b>not</b> edit unqualified <b>not</b> repairers, IT specialists <b>accept</b> directors
	(c)	dish aerial;	[1]	<b>accept</b> drawing of a dish <b>reject</b> dipole, wire, (ferrite) rod
	(d)	10 GHz;	[1]	
<b>Total</b>			<b>[5]</b>	

Question		Expected Answers	Marks	Rationale
3	(a)	emergency stop switch (owtte); (1) high voltage hazard (owtte); (1)	[2]	each correct statement = 1 mark
	(b)	turns off the electricity supply /power / current; (1) <b>one of the following:</b> <ul style="list-style-type: none"> <li>when there is current in Polly; (1)</li> <li>when Polly gets a shock; (1)</li> <li>when current to earth; (1)</li> <li>very quickly; (1)</li> </ul>	[2]	<b>not</b> stops electrocution  <b>not</b> just a fault / too much current from supply
	(c)	(i)	[3]	one mark for each correct entry <b>accept</b> two or three correct words in wrong places for 1 mark
		(ii)	[2]	not just modulates
		(iii)	[1]	
<b>Total</b>			<b>[10]</b>	



Question	Expected Answers	Marks	Rationale
4 (a)	any <b>three</b> of the following <ul style="list-style-type: none"> <li>• aerial makes picks up radio waves;</li> <li>• and makes (electrical) signals;</li> <li>• tuner selects signals;</li> <li>• close to one frequency / in one channel / for just one station;</li> </ul>	[3]	<b>accept</b> signal for radio waves  <b>ignore</b> references to demodulation
(b) (i)	reduces size of file / information / bits; (1) reducing time for transmission; (1)	[2]	<b>accept</b> transmits faster <b>accept</b> can store more signals / takes up less (memory) space <b>not</b> squashed / squeezed
(ii)	<b>any two of:</b> <ul style="list-style-type: none"> <li>• clearer signal; (1)</li> <li>• allows encryption; (1)</li> <li>• easy to store information; (1)</li> <li>• allows text or pictures; (1)</li> <li>• allows data to be edited easily; (1)</li> </ul>	[1]	needs two points for 1 mark  <b>accept</b> transmits faster
<b>Total</b>		[6]	

Question	Expected Answers	Marks	Rationale								
5 (a)		[3]	first and last boxes: handset for 1 mark middle three boxes: fibre - exchange - fibre for 1 mark exchange - fibre - exchange for 2 marks								
(b)	<table border="1" style="width: 100%; text-align: center;"> <tr> <td><b>input</b></td> <td><b>output</b></td> <td><b>processor</b></td> <td><b>link</b></td> </tr> <tr> <td>handset</td> <td>handset</td> <td>exchange</td> <td>optical fibre</td> </tr> </table>	<b>input</b>	<b>output</b>	<b>processor</b>	<b>link</b>	handset	handset	exchange	optical fibre	[1]	all correct = 1 mark
<b>input</b>	<b>output</b>	<b>processor</b>	<b>link</b>								
handset	handset	exchange	optical fibre								
<b>Total</b>		[4]									

Question		Expected Answers	Marks	Rationale
6	(a)	<b>any three of the following:</b> <ul style="list-style-type: none"> <li>• whole picture is a frame; (1)</li> <li>• made from (dots called) pixels; (1)</li> <li>• arranged in rows; (1)</li> <li>• video signal determines brightness of pixels; (1)</li> </ul>	[3]	one mark per point
	(b) (i)	5 760 000;	[1]	
	(ii)	720 000;	[1]	ecf on (b)(i)
<b>Total</b>			<b>[5]</b>	
<b>Paper Total</b>			<b>[36]</b>	

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