

Additional Applied Science A

General Certificate of Secondary Education

Unit **A326/02**: Communication

Mark Scheme for June 2011

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

© OCR 2011

Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

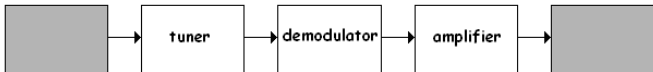
Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk


1. Annotations

Used in the detailed Mark Scheme:

Annotation	Meaning
/	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	Rationale
1	a	has only two values / doesn't have a continuous range of values / is pulsed / on or off / high or low	1	accept straight lines / blocks not up and down
	b	5 V	1	
	c	one line drawn: from 1.00 s; (1) to 1.0 Hz; (1)	2	apply ecf from incorrect period to frequency so, for example, 0.25 s to 4.0 Hz for 1 mark more than one line: 0.25 s to 4.0 Hz, 0.50 s to 2.0 Hz etc. for 1 mark
	d	any two of the following for [1] each: <ul style="list-style-type: none"> • can carry video or text or sound • can be compressed (for rapid transmission) • can be encrypted (for secrecy) • easily stored • easily edited / manipulated 	2	accept explanation of quality e.g. better signal-to-noise ratio, clearer, less noise/interference ... not faster / further / easier / cheaper
			6	

Question		Expected Answers	Marks	Rationale	
2	a	i	SD99 (pocket) fits into pocket; least weight; uses batteries / no wires to mains	1	needs any one reason from the list for the mark ignore cost and power no ecf from incorrect radio
		ii	LH56 because it runs off the mains	1	needs the reason for the mark ignore references to power or FM
	b	i		2	any two in the correct order for 1 mark any one box correct for 1 mark all boxes correct for 2 marks
		ii	flow of information (through the system) owtte	1	accept signal / waves / data / pulses instead of information not current / voltage / power reject references to flowcharts / order of operations ...
			5		

Question		Expected Answers	Marks	Rationale
3	a		2	each correct box for 1 mark not light for LED
	b	EITHER count the mistakes/errors in a message; divide by the message length; OR count messages with mistakes/errors; divide by the total number of messages OR find number of mistakes/errors; in a second / unit time / fixed time;	2	
	c	binary / ASCII / BCD / hexadecimal	1	look for a named digital code, not something which uses a binary code e.g. SMS, internet accept visual digital code e.g. traffic lights not Morse code
			5	

Question		Expected Answers	Marks	Rationale
4	a	modulation of wave (by the computer); (1) transmission by carrier wave (to printer); (1) demodulation of wave (by printer); (1)	3	accept any order
	b	reduces size (of file); (1) for reduced transmission time / less memory for storage (1)	2	accept travel faster not easier to send / store
	c	frequency modulation / FM	1	
			6	

Question	Expected Answers	Marks	Rationale
5 a	to keep the messages secret	1	
b	bits per picture = $60 \times 100 \times 2 = 12000$; (1) time = $12000 / 2400 = 5$ s (1)	2	accept reverse calculation i.e. $2400 \times 5 = 12\ 000$ bits = $60 \times 100 \times 2$ for 2 marks accept $\frac{60 \times 100 \times 2}{2400} = 5$ for 2 marks
c	range of frequencies; (1) for each channel / signal / link / station ... (1)	2	accept data transmission rate (owtte) for 1 mark
d i	500 MHz	1	
ii	any two of the following for (1) each: <ul style="list-style-type: none"> • each user has its own frequency / channel; • avoids conflicts with other users; • allows regulation (by Ofcom); 	2	
		8	

Question	Expected Answers	Marks	Rationale
6 a		3	camera correct for 1 mark screen and (loud)speaker (any order) for 1 mark demodulator for 1 mark accept TV / monitor / picture for screen
b	any two of the following for (1) each; <ul style="list-style-type: none"> • simpler / cheaper equipment; • all information is transmitted; • no processing delays; 	2	not easier accept more accurate / no gaps
c	internet / telephone (system) / cable (TV) / computer networks	1	accept email / fax not mobile (phone) / texting not just computers
		6	
	Paper Total	36	

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

14 – 19 Qualifications (General)

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations
is a Company Limited by Guarantee
Registered in England
Registered Office; 1 Hills Road, Cambridge, CB1 2EU
Registered Company Number: 3484466
OCR is an exempt Charity



OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553

© OCR 2011