Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

COMPUTING **9691/11**

Paper 1 Written Paper **May/June 2016**

MARK SCHEME

Maximum Mark: 75

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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1 Any **four** from: **[4]**

– must have available/use an expert system shell // inference engine are developed
– gather data/knowledge from technicians/engineers (NOT just "from experts")
– the knowledge base is populated with this data
– build the rule base
– the system is tested with data that produces predictable outcomes
– a suitable input/output interface is developed

Order is not important.

2 (a) RAM **[4]**

– stores data/applications/programs software/files/OS currently in use

ROM

– stores BIOS/start-up/files that cannot be altered

Hard disk drive

– stores applications/programs software/user's files //
– stores data/user files/programs when the computer is turned off

Optical storage device

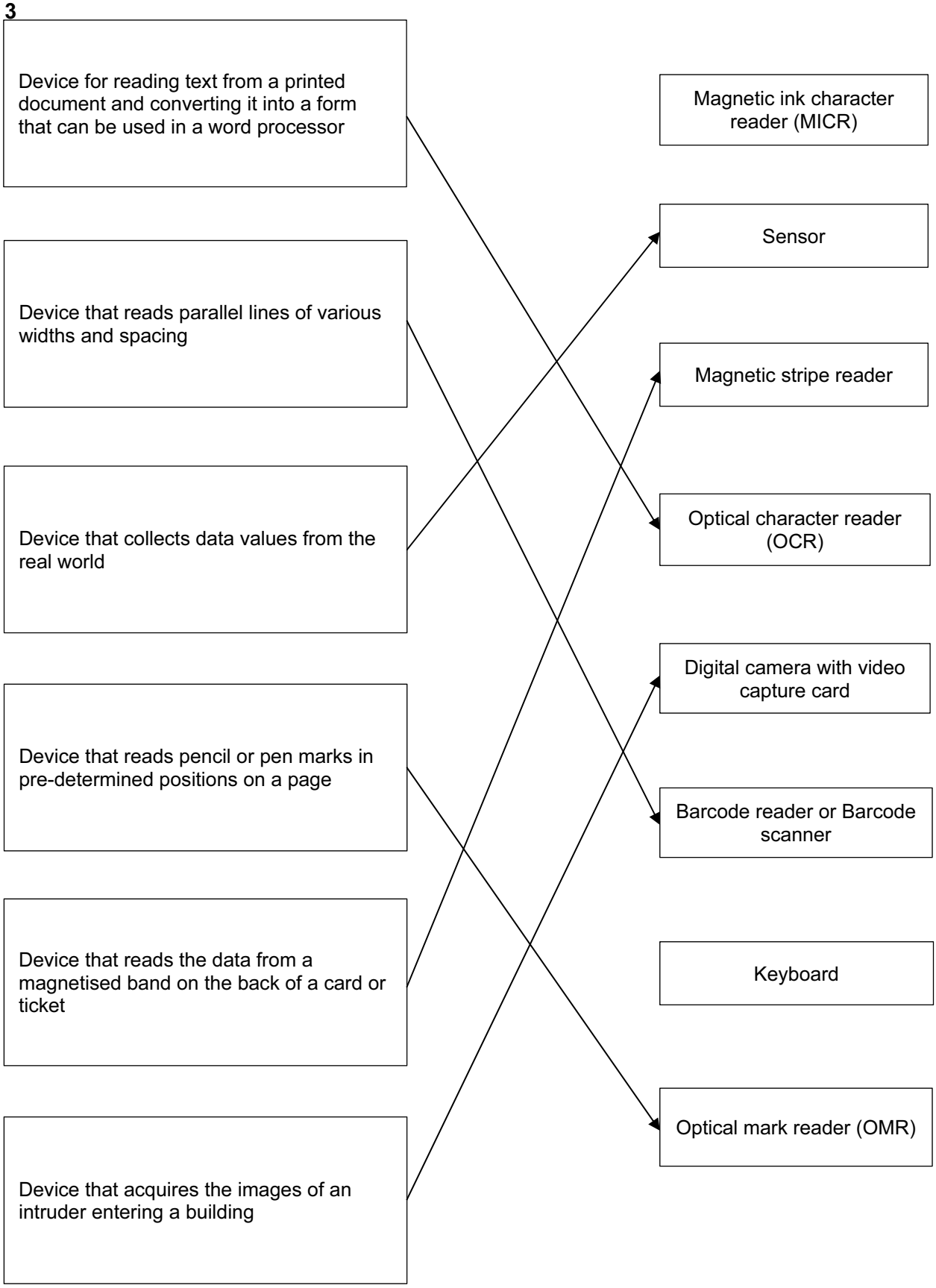
– stores data/or by example – photos/music/files / software that can be transferred between computers any sensible example
– stores applications to be installed

(b) Any **four** from: **[4]**

– lightweight/more compact
– no moving parts (so more robust)
– don't have to wait for device to "reach operating speed"/no latency time
– lower power consumption
– doesn't produce a lot of noise/heat
– much higher data access speed
– not affected by a magnetic field
– does not need to be defragmented (to maintain high data transfer rate)

Faster is not enough.

3 **[6]**



4 **[8]**

Field name	Type of validation check	Example of data which would fail the validation check
`IdNumber`	type/character check	e.g. 31AB41CD
	length check	e.g. 1234567 or 123456789
	range check	e.g. –3, 813415162
	uniqueness	e.g. show two ID that are identical
`HourlyRate`	type/character check	e.g. –10.00 // $21.00
	range check	e.g. –0.5, 8
`DateOfBirth`	format check	e.g. 1990/12/18 18th December 2002
	range check on values	e.g. 40/40/2020
`PhoneNumber`	length check	e.g. 0122 111 111
	type/character check	e.g. 7H542ABC
	format check	e.g. Newtown 01346 21 31 41

5 (a) (i) **[2]**

Type of transmission	Tick (✓)
serial	✓
parallel	

Mode of transmission	Tick (✓)
simplex	✓
half-duplex	
full-duplex	

(ii) **[2]**

Type of transmission	Tick (✓)
serial	
parallel	✓

Mode of transmission	Tick (✓)
simplex	
half-duplex	
full-duplex	✓

(iii) **[2]**

Type of transmission	Tick (✓)
serial	
parallel	✓

Mode of transmission	Tick (✓)
simplex	✓
half-duplex	
full-duplex	

(b) – packet switching **[5]**

– baseband

– protocol

– broadband // multiplexing

– circuit switching

6 (a) Graphs [6]

Benefit

– easier to understand and interpret data by the audience
– easier to show trends
– visually more interesting to the audience

Drawback

– not as precise as the raw data
– can over-simplify the data
– some people find it hard to understand

Video with sound

Benefit

– video and sound can enhance any text in the presentation
– audience connect better with video/sound
– possible to have sales voice-overs describing the product
– short video can show the product in use // sample action from gameplay
– video has greater impact/catches the audience's attention

Drawback

– need for correct/expensive hardware and software for the presentation
– needs a lot of skill/time/effort to produce the video clips
– could be annoying for passers by

Animation

Benefit

– provides visual interest to the presentation
– grabs attention of the audience
– can reveal bullet points in a staged way (for more impact)
– can link to sound and video for more effect
– can automate the presentation so it runs on its own
– shows the product realistically

Drawback

– can distract audience from the "facts"
– needs a lot of skill/time/effort to produce the presentation

(b) Desktop publishing **[4]**

These MUST relate to the scenario **not** generic examples
– producing user booklets to accompany the games software
– producing advertising leaflets for the product

Spreadsheets

– production of sales figures/graphs
– produce profit/loss graphs
– sales projections

Graphics packages

– design images/characters to be used in the computer games
– design images to be used on a website to advertise the products

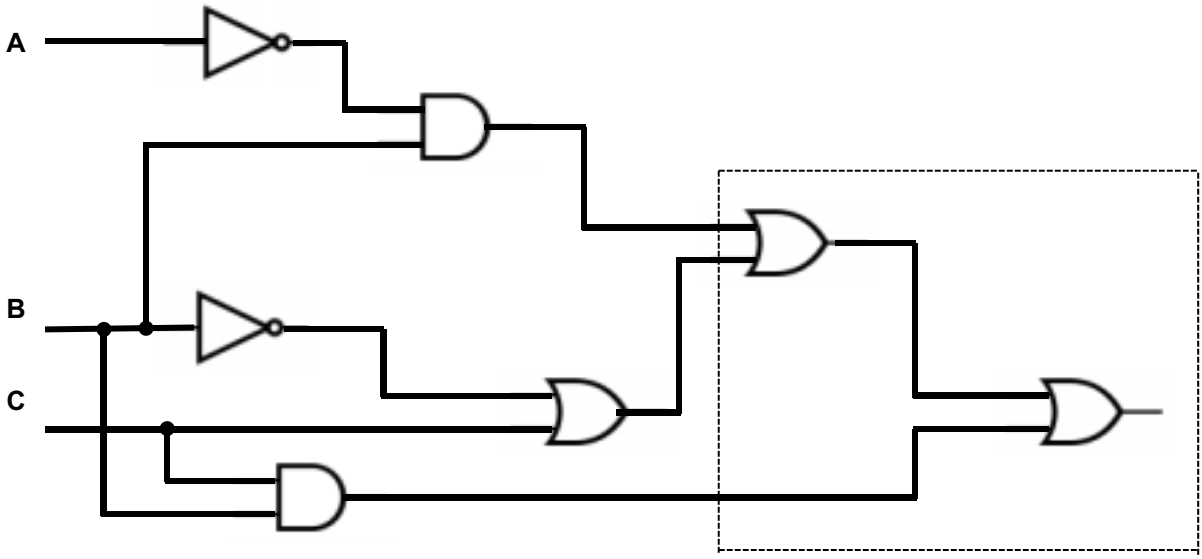
Word processor

– produce the text for reports
– produce the text for use in the user guides
– produce text for advertising/on company website

7 (a) **[4]**

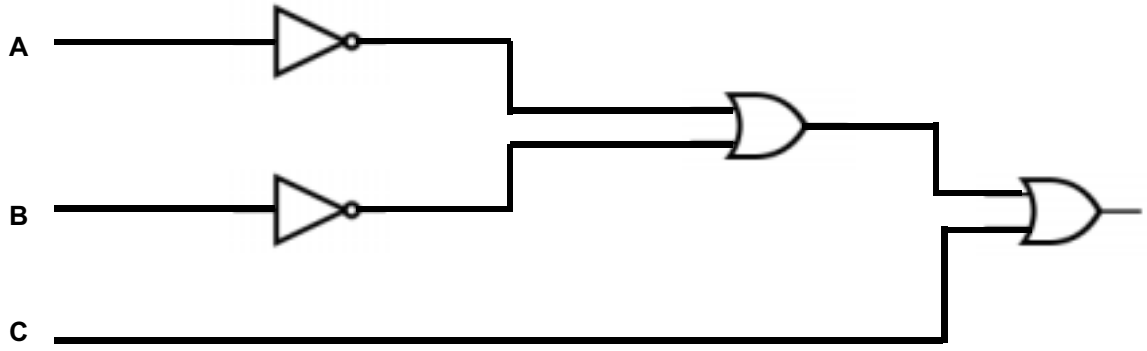
INPUTS			Workspace	OUTPUT
A	B	C		X
0	0	0		0
0	0	1		0
0	1	0		1
0	1	1		1
1	0	0		0
1	0	1		1
1	1	0		1
1	1	1		1

(b) 1 mark for each correct gate – except two OR gates on the right = 1 mark (if three-input OR gate, give 1 mark but 4-input OR gate give 2 marks) **[6]**



Alternative:

1 mark for each NOT gate
2 marks for each OR gate with correct inputs and outputs (in the diagram below)



8 (a) –1 **[1]**

(almost any value except 1 and 2)

(b) Description of the algorithm (or accept an algorithm): **[2]**

```
FOR Row ← 1 TO 7
   FOR Column ← 1 TO 7
      Board[Row, Column] ← -1 (or any value except 1 and 2)
   NEXT
NEXT
```

(1 mark for two **nested** loops …. or equivalent idea (e.g. description of loops)
1 mark for setting each value to –1 (or value given in (a) …. or description)

(c) Board[6, 4] = 1 **[2]**

Board[7, 5] = 2 ; 1 mark

ROW 1 mark

(d) Any **two** points from: **[2]**

– keyboard – to key in the x and y grid coordinates
– mouse – to click on the square on the monitor
– arrow keys – to position the cursor on the correct square
– touchscreen – touch the square on the screen

(e) Any **three** points from: **[3]**

– after each turn
– each value in array checked
– using FOR **nested** loops (or equivalent)
– if 4 successive “X” or “O” in a row then output ”WIN!”
– if 4 successive “X” or “O” in a column then output “WIN!” (either or both)

– if 4 successive diagonal values (e.g. [4, 4], [5, 3], [6, 2] and [7, 1]) then output “WIN!”

(allow an algorithm covering each of these points above)

9 (a) touchscreen / tablet **[4]**

- icons to represent items (such as bodywork, interior, engine) / menu based HCI
- good/clear instructions on how to complete order form/specifications
- easy to use navigation buttons (to go back and forward to options lists)
- use of drop down boxes with options available (e.g. paint colours)
- on screen help
- sumit button pressed

(b) Any **four** points from: **[4]**

- customer specification/details is/are stored on a database
- car database is compared to customer database/specifications ….
- …. Until a match is found
- matched car data will contain unique “pod” id
- computer will send signal to fork lift ….
- …. To move to required “pod”/retrieve required car
- if specification does not match up to available cars, the customer is informed