

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International Advanced Subsidiary and Advanced Level

**MARK SCHEME for the October/November 2015 series**

**9691 COMPUTING**

**9691/12**

Paper 1 (Written Paper), maximum raw mark 75

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 1 mark for type of software + 1 mark for justification  
No BRAND names for type of software

- (a) (i) – word processor  
– to enter/edit text for any part of her report
- spreadsheet  
– to produce graphs/charts to show her results  
– to carry out calculations on her results
- desktop publishing (DTP)  
– allows use of frames, etc., to produce a professional report  
– easier to manipulate graphs and images in her final report
- photo editing software  
– to edit photographs of the experiment
- database  
– use of queries (to group and calculate totals, sub-totals, etc.)  
– use of the ‘report’ facility  
– NE store data
- presentation software  
– to present her findings to teachers/other pupils using slides/sound/animation [6]
- (ii) off-the-shelf [1]
- (iii) – usually less expensive; the development costs can be spread over many purchasers of the software  
– they are frequently more sophisticated since the money generated from large sales (often global) allows more development work to be done  
– there will usually be **user groups** who can give help and support  
– the ability to export/import files into/from other packages is often easier since they are more likely to be compatible  
– the software is available immediately/readily; there is no need to wait while it is being written and developed  
– the software is usually relatively “bug free” since it has been highly developed using feedback and targeted user groups. [2]

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(b) (i) custom-written [1]

- (ii) – these are designed and written to meet the user’s specific requirements; consequently they will be more efficient and won’t contain unwanted features
- software developer can develop it so that it will not interfere with other software being used by the exam board; this will avoid any software clashes
  - it is often easier to use since the software can be written in conjunction with the end users in mind (the users get exactly what they need)
  - any modifications needed (e.g. due to changes in the business requirements) can be done more easily and more quickly since the changes are probably specific to the exam board
  - usually better customer support since the users can be in direct contact with the software designers/writers [2]

2 1 mark per point (3 marks maximum for each one).

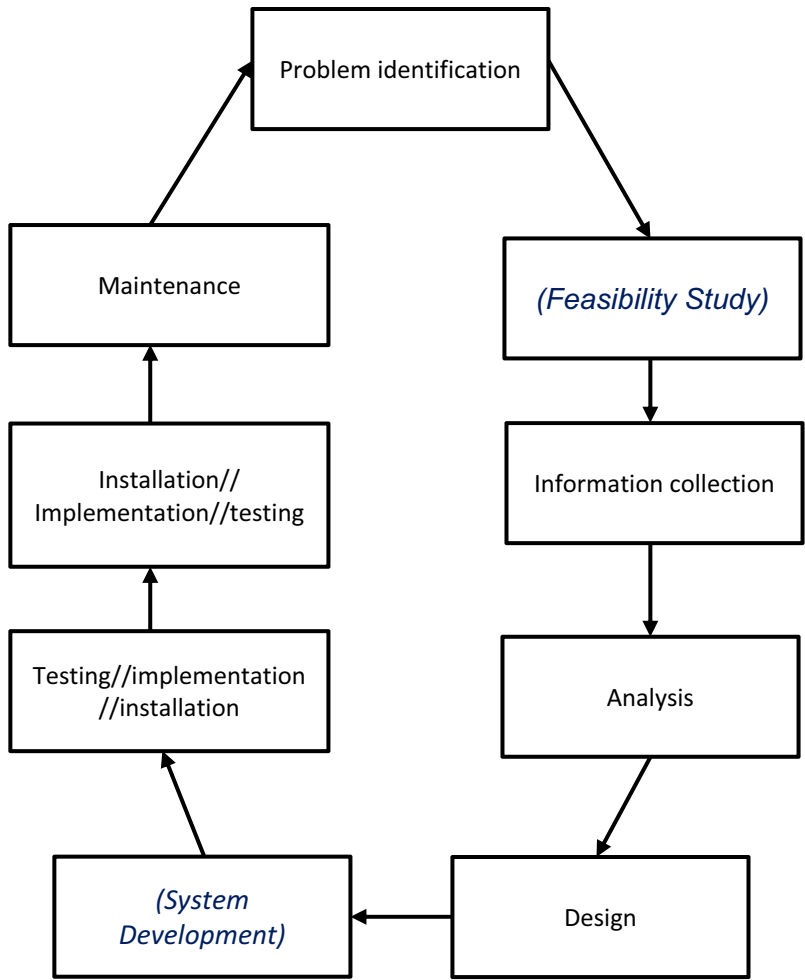
**CLI:**

- commands/instructions need to be typed in/entered
- user needs to remember the commands/use the correct syntax
- user needs to have some knowledge of how computers work
- user has more control over computer
- needs less system/memory resources
- user is in direct communication with the computer
- it is difficult to edit commands once they have been entered
- accesses the whole of the operating system

**GUI:**

- only need to click/select an icon to carry out function
- (standard) icons represent (intuitive) applications
- menus are used to select action/options
- use a windows, icons, menus and pointers environment (not just WIMP) [4]

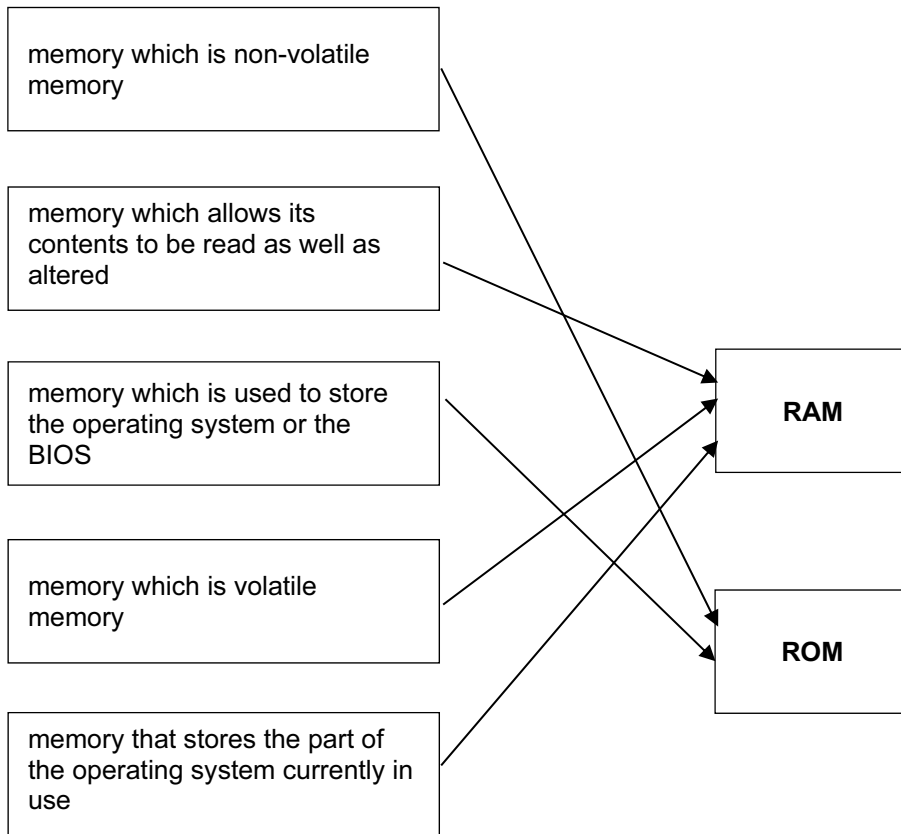
3



[5]

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4 (a)



[5]

(b) RAM

- stores the camera settings input by the user (focus, shutter speed, etc.)

ROM

- stores camera's factory settings/start up routines when camera switched on

Solid state memory

- stores/transfers photos/videos (captured by the camera)

[3]

(c) – USB cable connecting camera to computer/by using a USB port

- use of Bluetooth wireless connectivity

- insert memory card from camera into (card) reader in computer

- via the Internet – WiFi

[2]

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(d) (i) the size of the file is reduced (by removing unnecessary/redundant data) [1]

- (ii) – reduces memory used to store files (NOT 'space')
- allows transmission of files via email
- faster transfer of photos since files are reduced in size [1]

(e) Any **four** from:

**Assumes buffer in computer:**

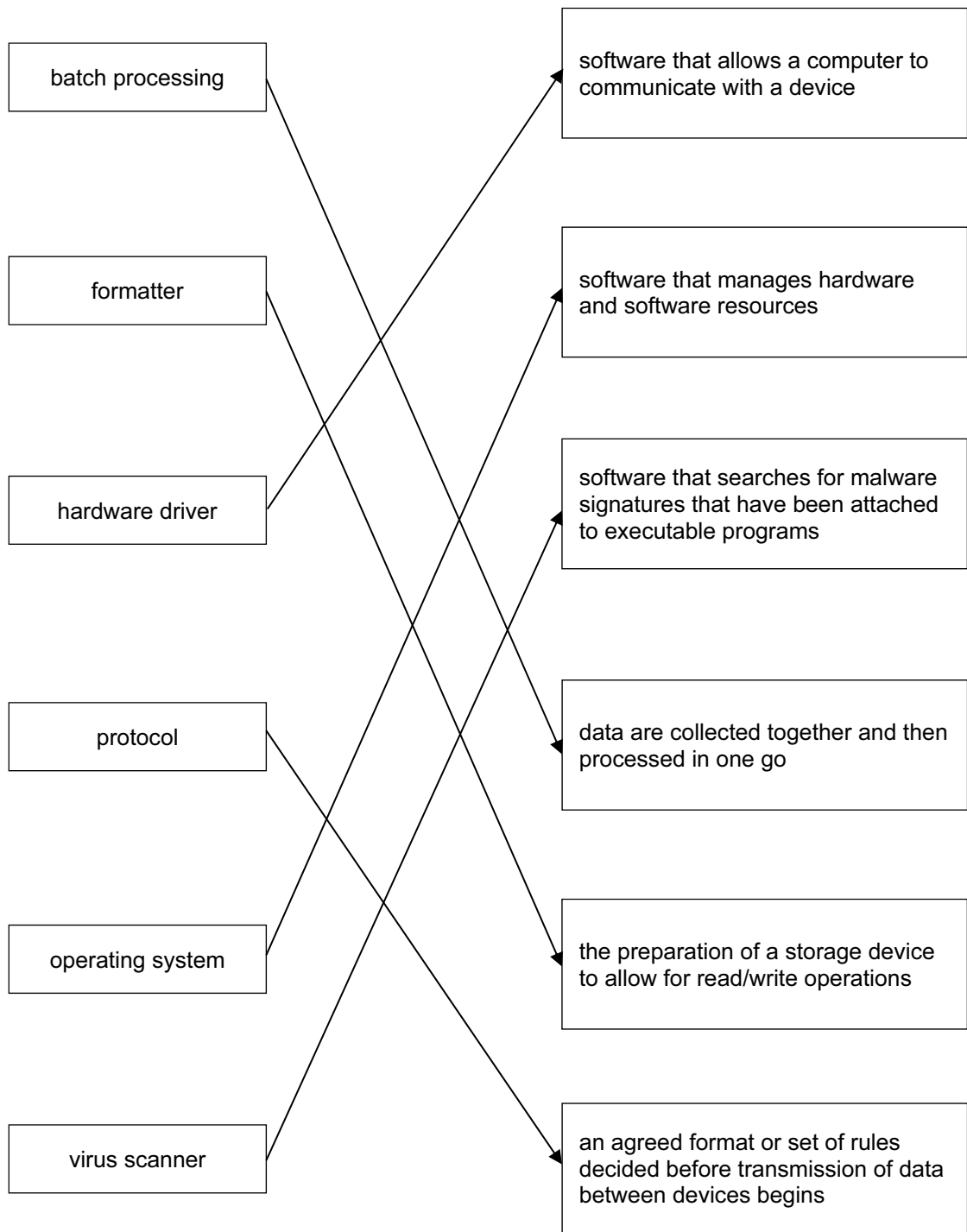
- photo files sent to (hard drive) buffer from camera
- when transfer complete, (computer) processor carries on with other tasks
- buffer is emptied (onto the hard drive)
- once the buffer is empty, an interrupt is sent to the (computer) processor requesting more data
- transfer is carried out according to job priorities

**Assumes buffer in camera:**

- photo files sent to (camera) buffer from camera (using camera processor)
- during this transfer, (computer) processor carries on with other tasks
- once the buffer is full, an interrupt is sent to the (computer) processor ...
- for the buffer to be emptied into computer memory/hard drive
- when buffer empty, (computer) processor carries on with other tasks while the camera (processor) refills the (camera) buffer
- transfer is carried out according to job priorities

[4]

5 1 mark per correct link (5 marks maximum)



[5]

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6 (a) Explanation (3 marks maximum)  
Decision (1 mark)

- the key parts of the digital image of the worker's face .../biometric comparison
- are compared to image of worker stored in computer memory/on chip on card
- card details need to match/find database details
- worker keys in his PIN into the reader
- the keyed in number is compared ...
- ... the PIN stored on the chip embedded in the card
- compares the card details with those stored on the computer
- compares card details with photo check details
- Decision – the worker must pass both checks

[4]

(b) **full duplex**

- data can be transmitted in both directions simultaneously

**serial transmission**

- data is transmitted bit by bit along a single wire/channel

[2]

(c) **knowledge base**

- contains all the facts/data/information/knowledge gathered from experts

**rules base**

- rules are applied to the facts
- allows inference engine/set of rules to draw conclusions/make decisions

**inference engine**

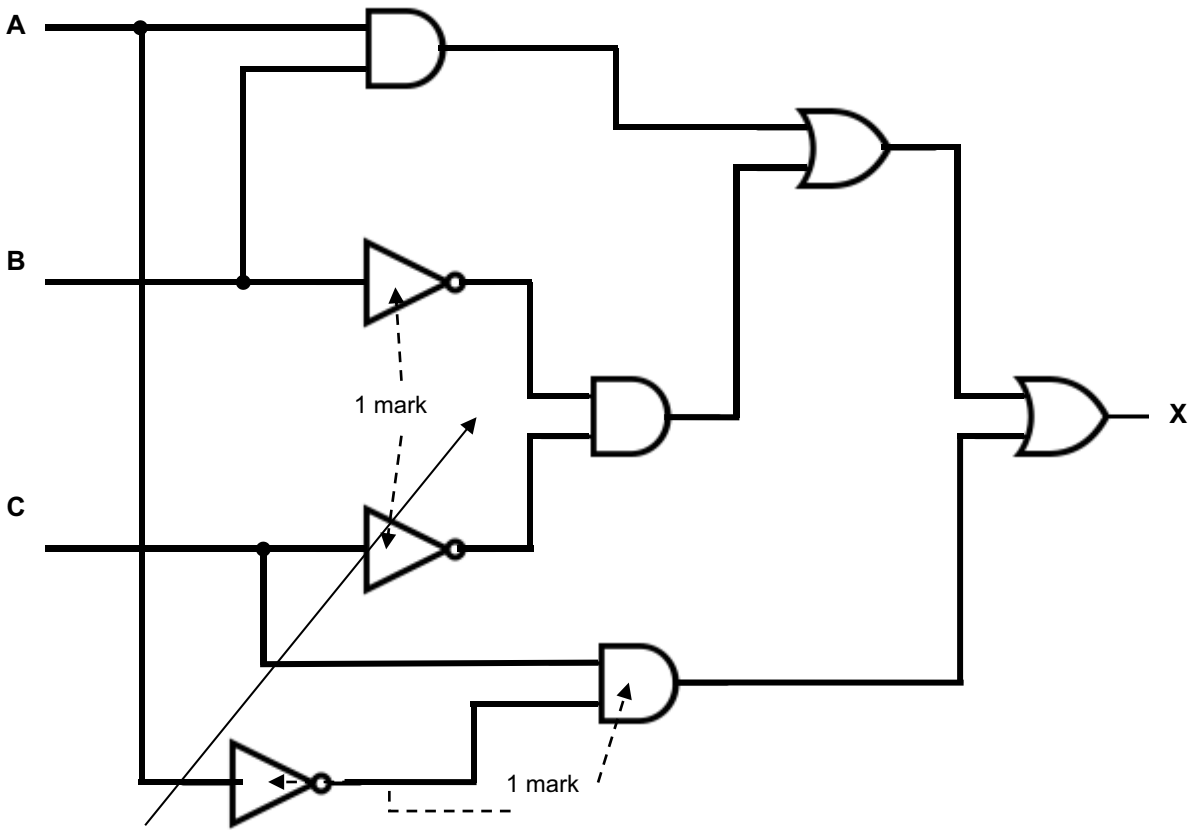
- applies the rules in the rules base to the facts/knowledge (if not already stated)
- acts as a kind of reasoning engine
- uses the facts/knowledge stored in the knowledge base

[3]



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7 (a) 1 mark to be allocated per gate except where shown differently.



Single NOR gate 2 marks, also a single 3 input OR gate at end.

[6]

(b) 1 mark for each pair of outputs (shaded in table).

inputs			Working	output
A	B	C		X
0	0	0		1
0	0	1		1
0	1	0		0
0	1	1		1
1	0	0		1
1	0	1		0
1	1	0		1
1	1	1		1

[4]

(c) (i) 93

[1]

(ii)

0	1	0	0	1	1	1	0
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[1]

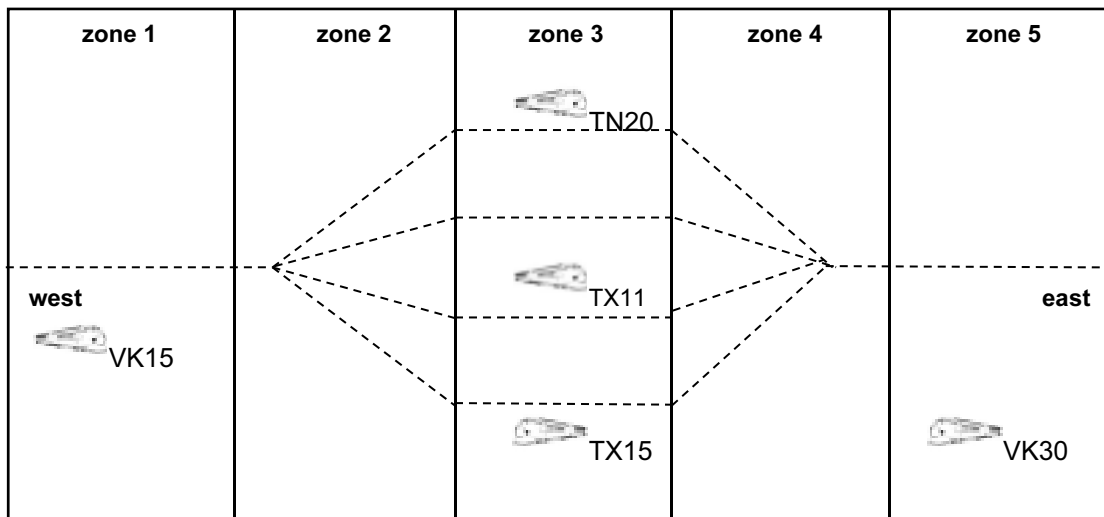
(iii) pattern with any consecutive 1 bits

[1]

(iv) 31

[1]

8 (a)



1 mark 3 correct in platform. 2 marks correct in zones 1 and 5

[2]

(b)

- flip direction of graphic  
... face left for west/right for east
- add arrow to show direction  
... point left for west/right for east
- colour code the direction  
... using a different colour for each direction or by example
- add to the data list  
... add value 'east/west'

[2]

(c) (i) Updating the screen (display) in line with the changed data list values

[1]

(ii) Train data is continually changing/Display must reflect reality of the train network/data list is dynamic/or by example

[1]

(d) Max. **2 marks** for hardware and max **2 marks** for software

- sensors (along sections of the track)  
... when train passes sensor sends train data to computer system
- train is fitted with an RFID tag/or equivalent GPS  
... identifies the train
- remote camera optical character recognition used from the captured image
- database  
... stores/continually updates the data list data
- software calculating speed/position and comparing for that part of track

[4]