
COMPUTING

9691/13

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.

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1 Any **two** from: [2]

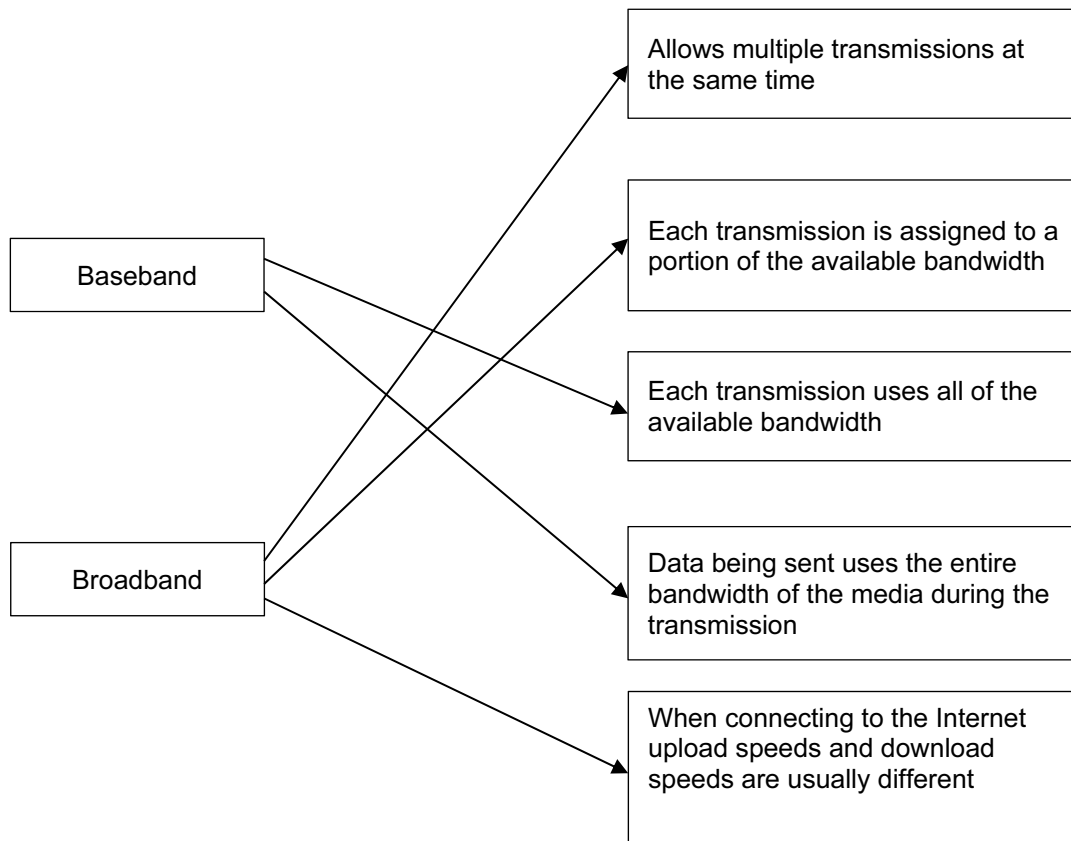
RAM

- volatile/temporary memory//loses contents on switching off the power
- data can be altered/added/deleted by the user/computer
- used to store data/operating system currently in use
- can have DRAM and SRAM technologies
- fast access memory/on a chip

ROM

- non-volatile/permanent memory//contents retained on switching off power
- contents cannot be altered
- used to store start-up routines/BIOS

2 (a) [5]



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(b) (i) Any **two** from: [2]

- always “on”/no need to keep dialling up every time
- allows telephone to be used at same time as computer/Internet
- much faster data transfer rate/upload rate/download rate
- dial-up charges per minute of use/broadband is flat rate

(ii) Any **two** from: [2]

- video conferencing/VoIP
- streaming of videos/music from the Internet/on line
- transferring/receiving large files
- online gaming
- increase in number of devices using broadband (tablets, smartphones, satellite TV boxes, etc..) all compete for broadband services – high-speed needed to remove bottleneck
- e-commerce (suitable example)

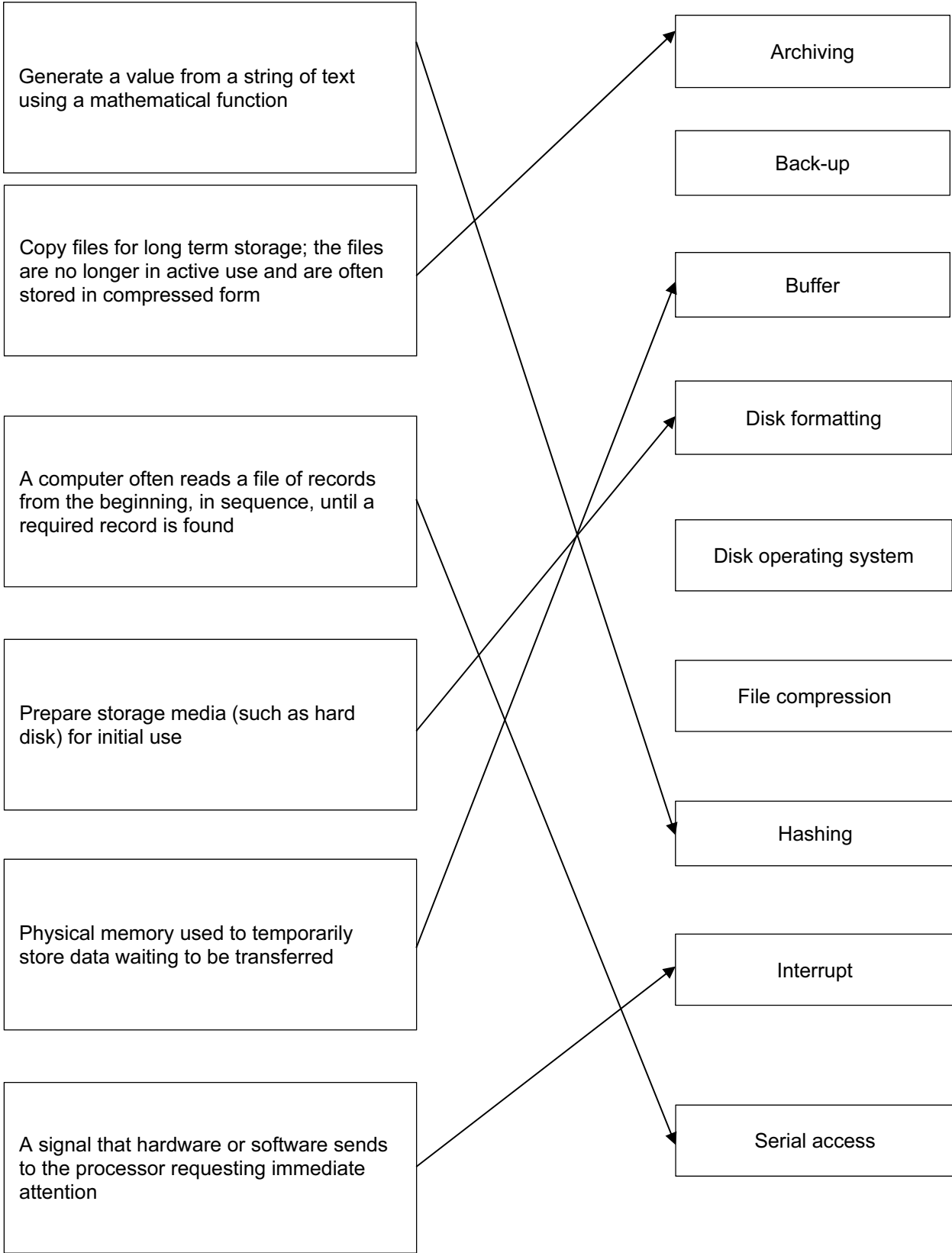
(c) (i) Any **two** from: [2]

- route/path decided on before data transmission starts
- system decides which route/path to follow ...
- ...and transmission uses this route/path
- ...for the whole length of communication session/route is dedicated exclusively
- the route/path is only released when data transmission stops

(ii) Any **three** from: [3]

- source address
- sequence number of packet to allow re-assembly at destination
- protocol used
- hop counter
- check sum
- time stamp
- packet size

3 [6]



4 (a)

[4]

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

- (b)
- | | | | |
|--------------------------|------------------------|---------------------------|------------|
| A . B +
(1 mark) | B . C
(1 mark) | . (B + C)
(1 mark) | [3] |
| (A AND B) OR
(1 mark) | ((B AND C)
(1 mark) | AND (B OR C))
(1 mark) | |

(Notes: (1) remember that formulas can be reversed e.g. B.C.(B + C) + A.B
 (2) the full stop “.” for AND may be missing but this is OK
 (3) also accept answers such as (A = 1 AND B = 1) OR ((B = 1 AND C = 1) AND (B = 1 OR C = 1))

May also use \cap and \cup as the symbols for AND and OR

5 (a)

[2]

- the maximum mark
- in maths from all students

(b)

[2]

- use of $\overbrace{\text{IF}(E3>69, \text{“Distinction”}, \text{IF}(E3<50, \text{“Fail”}, \text{“Pass”}))}^1$
- formula written in F3 and then replicated down to F8
- (MAX 1 mark if correctly described in words)

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(c) Any **two** from (1 mark for naming feature, 1 mark for how it is used) [4]

- use of conditional formatting
 - use of colours to show good and poor performance
- use of graphs
 - to show marks for each student in each subject
 - to show highest and lowest marks for each subject / show trends
- use of macros
 - to find averages (and other statistical data)
- use of LOOKUP/VLOOKUP / named appropriate function
 - to show names of teachers for each subject etc.
- use of filters / sort to display high to low marks

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

- don't have to wait a long time for software to be written/available immediately
- usually cheaper since development costs shared by users
- usually fully tested in a number of scenarios
- usually has user groups who can supply help
- automatic/free upgrades when a new version is written
- usually works with existing software
- less need for training since users familiar with other “same company” software

6 (a) 1 mark for naming topology + 1 mark for benefit + 1 mark for drawback [6]

Ring

- transmission of data is simple as it only travels in one direction
- no data collisions
- easier to add additional computers/nodes
- no server
- adding extra components does not affect performance

- if a fault develops in one computer/node whole network is affected
- data must pass through each computer/ node which slows down data transmission
- less secure as packets pass by all nodes
- harder to expand

Star

- if one computer/node fails it doesn't affect rest of the network
- very few data collisions since each computer/node is attached to central hub
- better security than bus (since data only goes to destination computer)
- different communication method/speed can be used on each branch
- can be used as a WAN topology

- more expensive to set up than bus (because of cabling requirements)
- if the central hub fails, the whole network is affected

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(b) 1 mark for naming hardware + 1 mark for function

[6]

- Communications medium / cable (**not** wires or coaxial)
- Network Interface Card / NIC
- connects device to network and allows communication between computers
- WAP (wireless access point)
 - allows user to gain access to network wirelessly
- modem
 - allows communication over telephone network/analogue-digital conversion
- router
 - sends data between networks by selecting best path/route
 - allows connection of a LAN to a WAN
- repeater
 - boosts/strengthen signal as it passes through network cables
- gateway
 - connects and passes packets between 2 networks that use different communication protocols
- bridge
 - passes packets between 2 segments of the same network
- switch
 - receives data and sends it to the appropriate port

7 (a) Maximum **3 marks** for any one method

[8]

Observation

- watch telephone operator / delivery driver BOD employees
- taking a call // loading the van
- time and motion study

Examine documentation

- look at schedule for collection/delivery
- look at paperwork for an individual customer

Interviews

- prepare a set of questions
- interview manager / selected customers / telephone operator
- on a face-to-face/one-to-one basis
- can ask unprepared follow up questions during the interview
- document the answers

Questionnaires

- give out paper questionnaires to customers/delivery drivers
- summarise the answers

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(b) (i) Any **two** from: [2]

- keyboard entry is slow/unnecessary data needs to be keyed in
- more likely to make errors (using keyboard)
- it is a slow and cumbersome method to gather data
- <ENTER> is not a sensible way to navigate to the next screen
- Repetitive instructions
- Poor use of screen space

(ii) Any **three** from: [3]

- Use of widget controls/mouse/touchscreen to do selections/reduces amount of typing
- calendar controls for the collection date // drop-down lists for day/month/year
- drop-down lists for time
- radio button / check box for express delivery/ insurance
- check boxes for pick-up time slots
- reset button in case of mistakes on data entry

8 (a) (i) [1]

0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(ii) [1]

0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(b) Letter “S”/19th letter in alphabet (1 mark) [2]

- binary number 0100110000000000 moved 10 places left } (1 mark)
- so binary number becomes 0000000000010011 }
- $16 + 2 + 1 = 19$ }

(c) Any **two** from: [2]

- not enough places to move to the left
- except for letter “A”
- there are only 16 bits available (and encoding key is 15)
- would end up with sixteen zeros
- except for letter “A”

9 (a) – binary number has four 1s, so has even parity [1]
 – number value has no bearing on type of parity

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- (b) – sensors don't control devices [1]
 - sensors not connected directly to heaters/devices

- (c) Listings and system flowcharts are in the technical documentation (**not** user guide) [1]

- (d) Stacks use LIFO // queues use FIFO [1]

- (e) – GUIs use icons // CLIs use keyboards [1]
 - CLIs need user to type in commands to launch applications