Cambridge International AS & A Level

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Cambridge International Advanced Subsidiary and Advanced Level

COMPUTING **9691/13**

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

MARK SCHEME

Maximum Mark: 75

Published

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

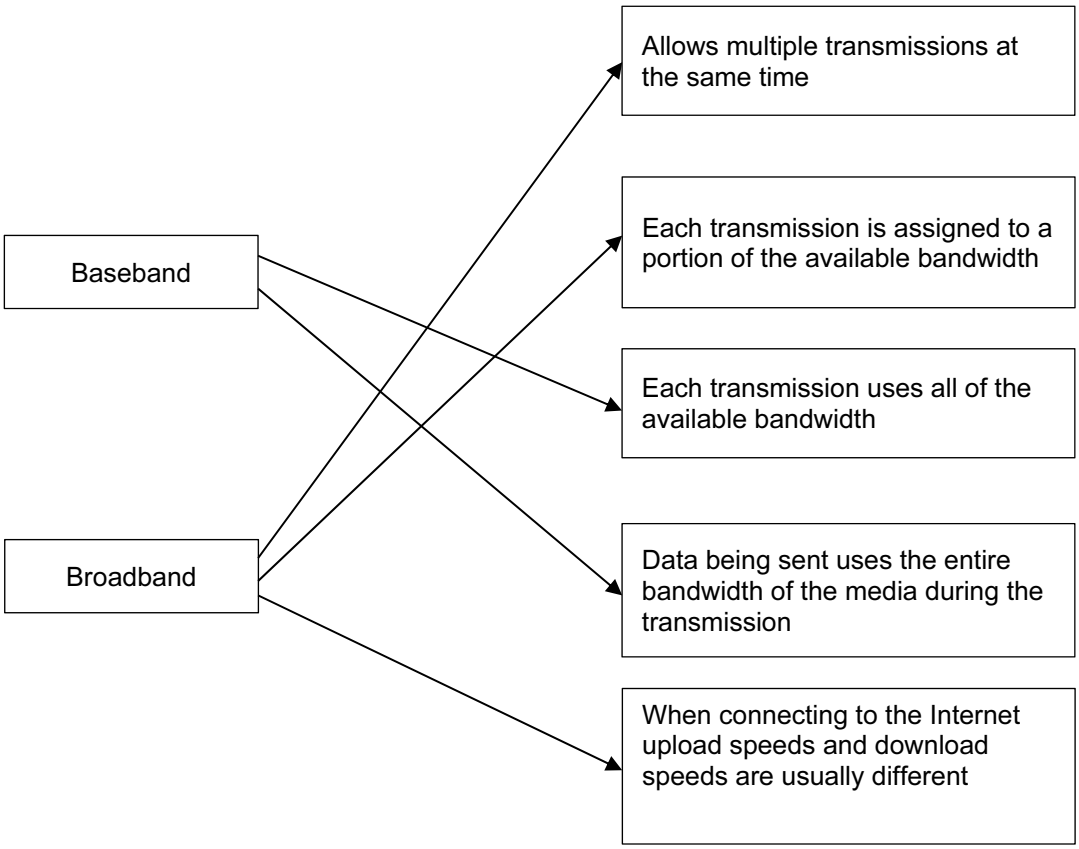
RAM

– 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 <u>before</u> 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

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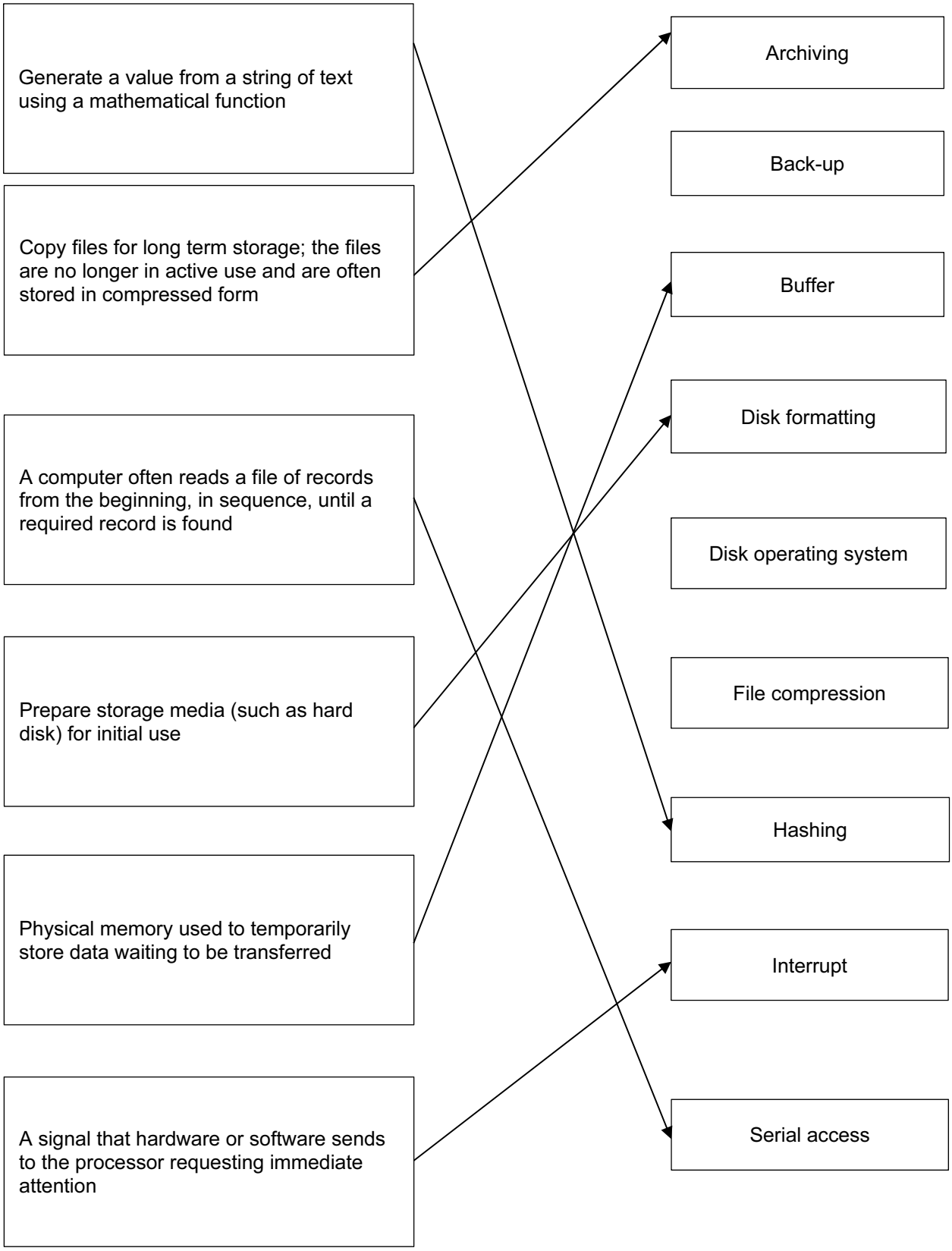
3 **[6]**



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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) **[3]**

A . B + (1 mark) B . C (1 mark) . (B + C) (1 mark)

(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 ∩ and U as the symbols for AND and OR

5 (a) **[2]**

– the maximum mark
– in maths from all students

(b) **[2]**

1 1

– use of IF(E3>69, "Distinction", IF(E3<50, "Fail", "Pass"))
– 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 }
- so binary number becomes 0000000000010011 } (1 mark)
- 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

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