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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0478 COMPUTER SCIENCE

0478/12 Paper 1, maximum raw mark 75

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1 1 mark for each risk + 1 mark for corresponding reason why it is a risk and 1 mark for method of minimisation

Risk: hacking
Reason: illegal/unauthorised access to data
deletion/amendment of data
Minimised: use of passwords/user ids
use of firewalls
encrypt data/encryption

Risk: virus
Reason: can corrupt/delete data
cause computer to crash/run slow
can fill up hard drive with data
Minimised: use of /run anti-virus (software)
do not download software or data from unknown sources

Risk: spyware/key logging (software)
Reason: can read key presses/files/monitors on a user's computer
Minimised: use of/run anti-spyware (software)
use data entry methods such as drop-down boxes to minimise risk

Risk: phishing
Reason: link/attachments takes user to fake/bogus website
website obtains personal/financial data
Minimised: do not open/click emails/attachments from unknown sources
some firewalls can detect fake/bogus websites

Risk: pharming
Reason: redirects user to fake/bogus website
redirection obtains personal/financial data
Minimised: only trust secure websites, e.g. look for http**s**
check the URL matches the intended site

Risk: credit card fraud/identity theft
Reason: loss of money due to misuse of card/stealing data
Minimised: set passwords
encrypt data/encryption

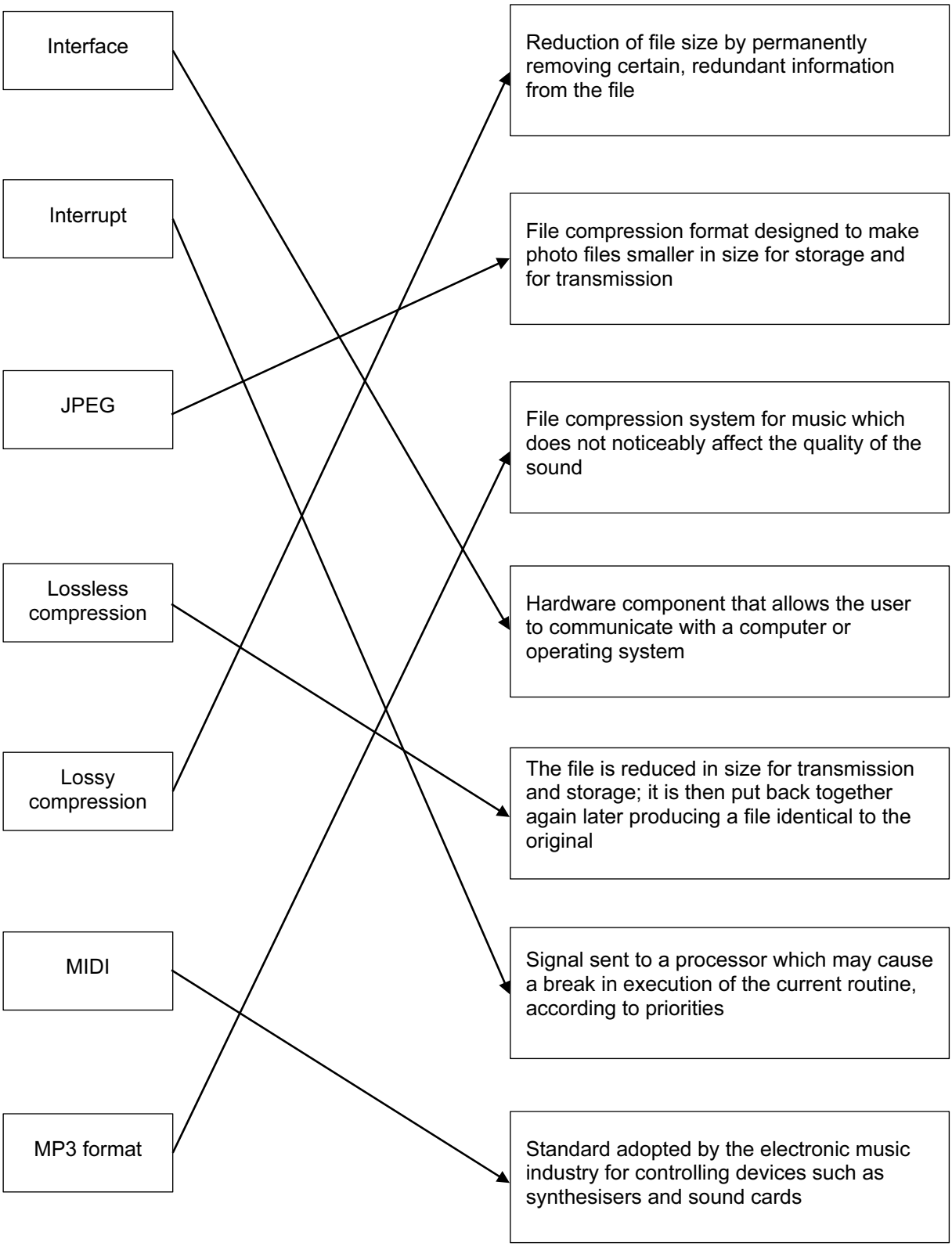
Risk: cracking
Reason: illegal/unauthorised access to data
Minimised: setting strong passwords
encrypt data/encryption

There may be other valid answers given that are outside the provided mark scheme.

[9]

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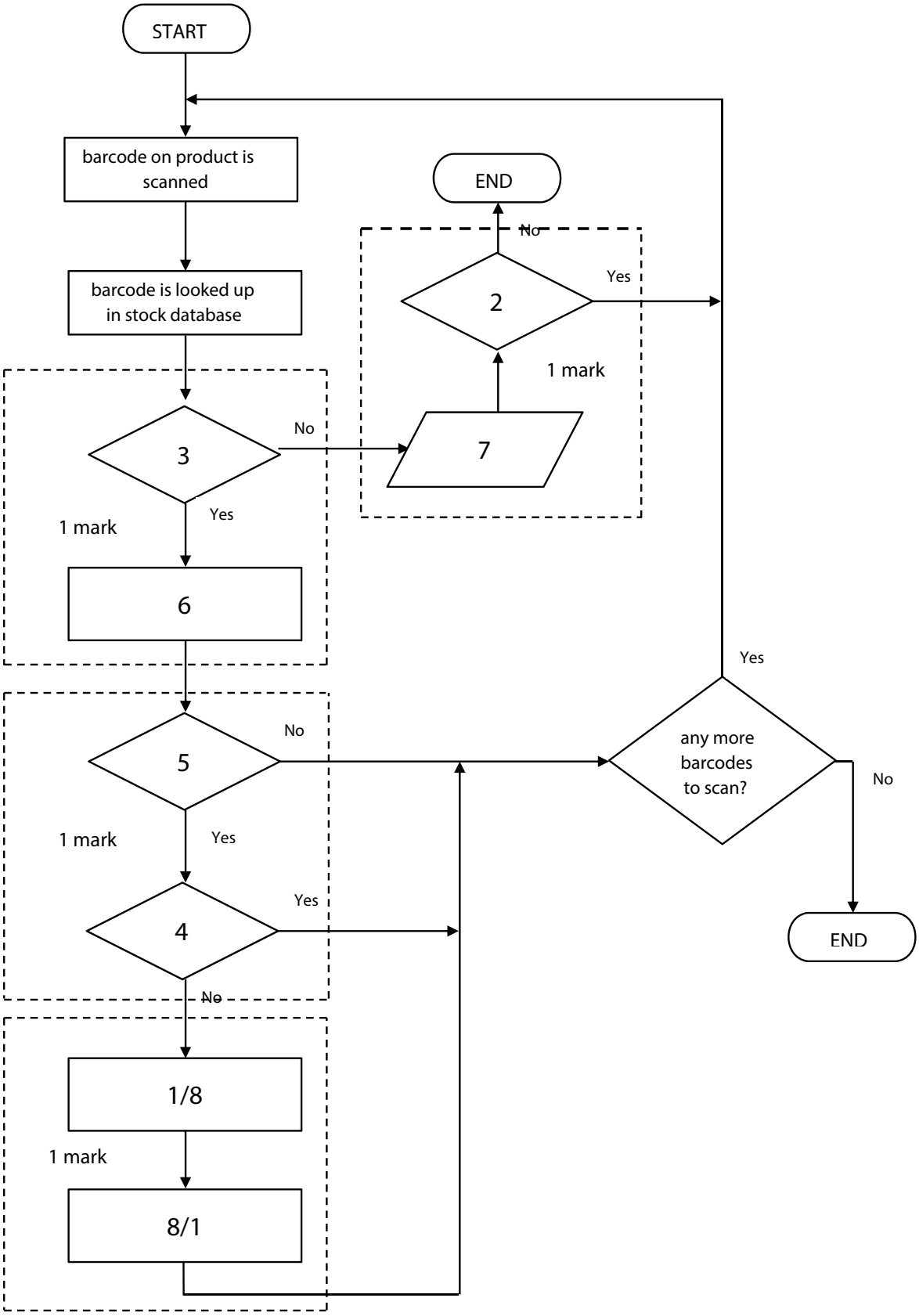
2



[6]

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3



[4]

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4 (a) (i) For each hex number, 2 marks if all correct, 1 mark for 2 correct conversions

F A 7:

1	1	1	1		1	0	1	0		0	1	1	1

D 3 E:

1	1	0	1		0	0	1	1		1	1	1	0

[4]

(ii) 2 marks if all correct, 1 mark for 2 correct conversions – Follow through

1	1	0	1		0	0	1	0		0	1	1	0

[2]

(iii) 2 marks if all correct, 1 mark for 2 correct conversions – Follow through
D 2 6 [2]

(b) (i) (X) FF FF 00

(Y) FF 00 FF

(Z) 00 FF FF [3]

(ii) – hex values between 0 to F are combined together to create a hex code
– different combinations in hex codes will create different shades/tones/colours [2]

(c) (i) First six digits: manufacturer code/manufacturer ID

Last six digits: serial number/serial ID of device/product [2]

(ii) Allows all devices to be <u>uniquely</u> identified [1]

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5 (a) Any **five** from:
- naming a suitable sensor, e.g infra-red, pressure, motion sensors, send signal/data to microprocessor
- signal/data is converted to digital (using an ADC)
- microprocessor instructs/send signals to camera to capture image/video
- captured image/video data sent to microprocessor

either
- microprocessor compares the image/video with stored images/video…
- … if person detected = stored image …
- …alert given to signal a person has been identified

or
- microprocessor compares the biometric data from an image/video with stored biometric data for images/video …
- … if biometric data matched = stored data …
- … alert given to signal a person has been identified

- Continual/repeated process [5]

(b) 1 mark for correct calculation, 1 mark for correct answer
- number of photos = **12 × 60 × 24** = 17 280
- memory requirement = 17 280/1024 = **16.9 (16.875)**
- (17 280/1000 = 17.28/17.3 is acceptable) [2]

(c) Any **two** from:
- (data transmission) is faster
- more secure/safer (because it is a dedicated line)
- (fibre optic transmission) is more reliable [2]

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6 (a) Any **three** from**:**
- hypertext mark-up language
- used to create/develop/author webpages
- translated by a browser to display webpages
- uses (opening and closing) tags to display/format content [3]

(b) Structure:
- instructs how the layout of the content is displayed

Presentation:
- instructs how the content will be formatted e.g. colour/style/CSS [2]

(c) Any **three** from**:**
- displays web page
- interprets/translates the HTML document
- interprets/translates embedded scripting, for example JavaScript
- provides functions, such as bookmarks and history
- identifies protocols, such as https, SSL [3]

7 (a) (i) 1 mark for correct check digit and 1 mark for showing the calculation

(4 × 1) + (2 × 2) + (4 × 3) + (1 × 4) + (5 × 5) + (0 × 6) + (8 × 7)

= 4 + 4 + 12 + 4 + 25 + 0 + 56 = 105

105/11 = 9 remainder 6

check digit is: **6** [2]

(ii) 1 mark
- No**/**incorrect check digit

2 marks
- Total is 78
- 78/11 …
- … gives 7 remainder 1
- check digit should be 1 [3]

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(b) (i) 1 mark for each correct parity bit

parity bit

0	**1**	**1**	**0**	**0**	**1**	**1**	**0**

parity bit

1	**0**	**0**	**0**	**0**	**0**	**0**	**1**

[2]

(ii) Any **one** from:
- an even number of digits are changed
- a transposition error(s) has occurred [1]

8 1 mark for each step in correct order. (NOTE: Marks can be awarded for a correct sequence.)

Steps in the printing process	Step order
As the printing drum rotates, a laser scans across it; this removes the positive charge in certain areas	**4**
The printing drum is coated in positively-charged toner; this then sticks to the negatively-charged parts of the printing drum	**6**
The paper goes through a fuser which melts the toner so it fixes permanently to the paper	**9**
The printer driver ensures that the data is in a format that the laser printer can understand	***(1)***
A negatively-charged sheet of paper is then rolled over the printing drum	**7**
Data is then sent to the laser printer and stored temporarily in the printer buffer	**2**
The toner on the printing drum is now transferred to the paper to reproduce the required text and images	**8**
The printing drum is given a positive charge	**3**
Negatively-charged areas are then produced on the printing drum; these match exactly with the text and images to be printed	**5**

[8]

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9 (a) RAM
– contains instructions/program/data currently in use

ROM
any **one** from**:**
– contains the start-up/bootstrap program
– contains/stores the setting for frequency (can't be changed)

Solid state drive
– stores the instructions/program/data (to operate the car) [3]

(b) 1 mark for device and 1 mark for corresponding reason

Device:
– touch screen
– key pad (NOT keyboard)

Reason:
– easy to use interface
– limited number of options
– small space/space is limited
– other devices such as mouse, keyboard, trackerball, … not suitable [2]

(c) Any **two** from:
– A solid state drive has no moving parts
– A solid state drive has faster random access
– A solid state drive has a quick start up/shut down time (reduced latency)
– A solid state drive is very small
– A solid state drive is very light
– A solid state drive consumes very little power
– A solid state drive does not generate a lot of heat (therefore safer in this application) [2]

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