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Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2015 series

9608 COMPUTER SCIENCE

9608/13 Paper 1 (Written Paper), maximum raw mark 75

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1 (a) any **two** from:

– sequence of digital signals / bits
– over a communication path / Internet
– transfer of data at high speed
– requires fast broadband connection
– requires some form of buffering
– bits arrive in the same order as sent [2]

(b) (i) any **two** from:

– no need to wait for a whole file to be downloaded
– no need to store large files on user's computer
– allows on demand playback
– no specialist software is required for playback in browser [2]

(ii) any **two** from:

– video stops / hangs if very slow Internet / broadband speed low
– video stops / hangs if inadequate buffering capacity
– loss of Internet means can't access films / files
– may require specific software to run the files / films
– viruses can be downloaded from the websites [2]

(c) 2 marks for on-demand and 2 marks for real-time

on-demand

– digital video tape, analogue video tape, or digital files are converted to bit streaming – format for broadcasting on the net; this is known as encoding these encoded streaming video files are then uploaded to a dedicated server
– a link for the encoded video is placed on a web site
– a user clicks on the link to download the encoded streaming video; the streamed video is
– then broadcast to the user as and when they require it
– can be paused / can go back and re-watch / fast-forward, etc.

real-time

– an event is captured live with a video camera
– the video camera is connected to a computer
– the video signal is converted to streaming media files (encoded) on the computer
– the encoded feed is then uploaded from the computer to a dedicated streaming server via cable, DSL, or a high-speed internet connection
– the server then sends the live images it to all users requesting it as real-time video streaming
– cannot be paused etc. [4]

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2 **(a)** A = control bus

B = address bus

C = data bus [3]

(b) Program Counter – stores the address of next instruction to be executed

Memory Data Register – stores the data in transit between memory and other registers // holds the instruction before it is passed to the CIR

Current Instruction Register – stores the current instruction being executed

Memory Address Register – stores the address of the memory location which is about to be accessed [4]

3 **(a)**

Statement	True (✓)
The IP address consists of any number of digits separated by single dots (.)	
Each number in an IP address can range from 0 to 255	✓
IP addresses are used to ensure that messages and data reach their correct destinations	✓
Public IP addresses are considered to be more secure than private IP addresses	

accept words TRUE or FALSE in right hand column
1 mark per tick, –1 mark for each wrong tick if more than 2 [2]

(b) **(i)** http – enables browser to know what protocol is being used to access information in the domain

cie.org.uk – cie.org.uk is the domain name

computerscience.html – actual web page / file being viewed [3]

(ii) **%20** – because <space> not allowed in a URL, %20 is the coding for a space (32 in denary)

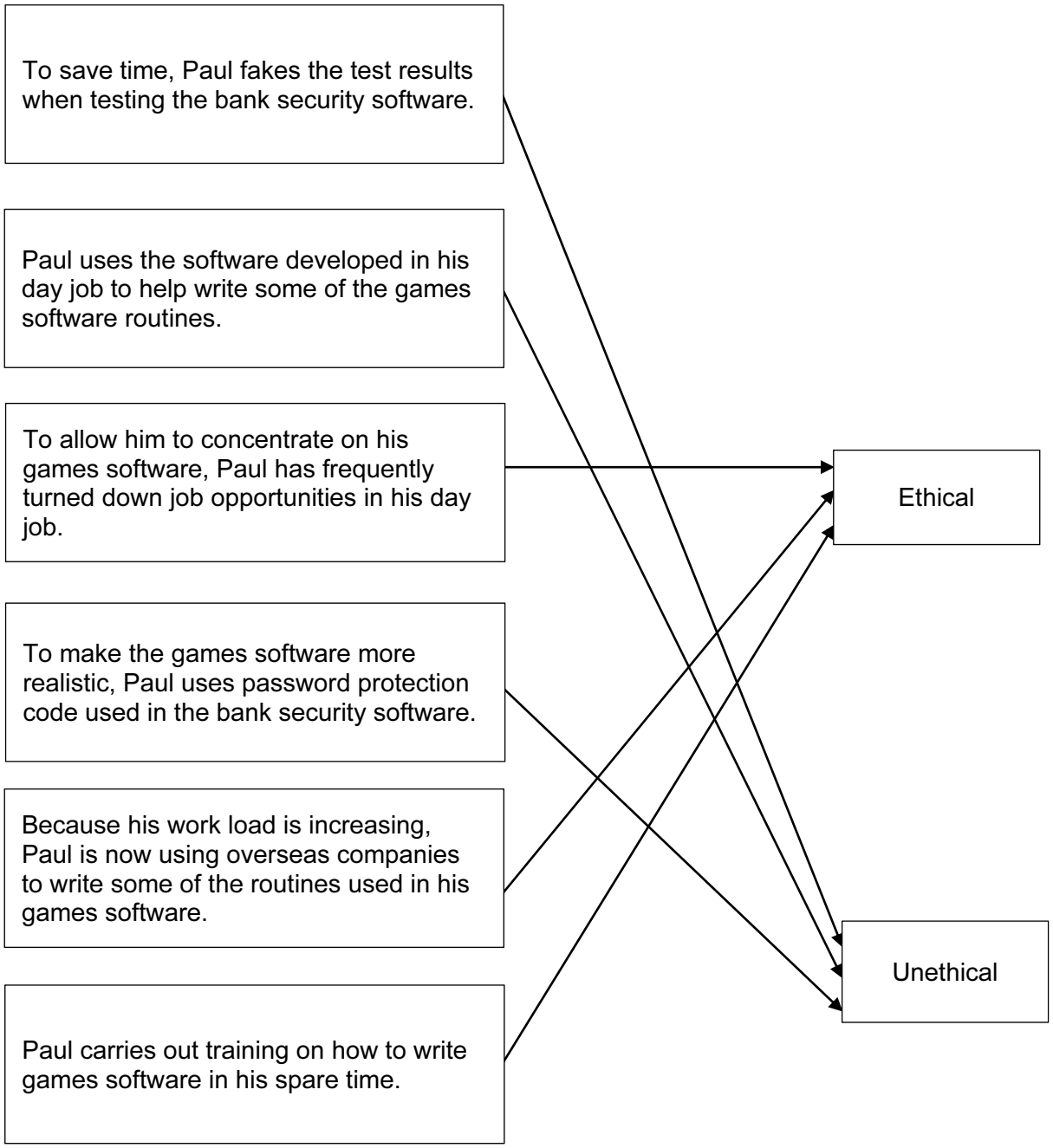
? – separates the URL from all parameters or variables [2]

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4



1 mark for each correct line, two lines from one box is incorrect [6]

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5 **(i)** any **four** from:

– sensors send signals / data to a computer
– data / signal converted to digital (using an ADC)
– computer calculates the activity value based on sensor signal strength / data
– if calculated value > 3,
– determine location of sensor
– build up a map of seismic activity
– location and magnitude sent to printer
– … via USB port / wireless link
– monitoring is continuous [4]

(ii) – output / hard copy not picked up in good time [1]

(iii) 1 mark for name + 1 mark for reason for choice

– speaker / buzzer / alarm bell
– gives control room operators an audible warning
– flashing lights
– gives control room operators an visual warning
– monitor
– use of red / flashing colours on monitor gets the attention of operators [2]

6 any **four** points from (maximum 3 marks per type of cable):

– fibre optic cables have greater bandwidth
– fibre optic cables need less signal boosting // can transmit over longer distances
– fibre optic cables have greater security (more difficult to “tap” into)
– fibre optic cables are immune to electromagnetic and other effects
– fibre optic cabling is lighter in weight (easier to install)
– fibre optic cables consume less power
– copper cabling is less expensive to install
– copper cable is easier to install <u>because</u> it is more flexible
– it is easier to make terminations using copper cabling
– the expertise in use of copper cabling is more extensive
– has been around for years … so very little is “unknown” about installations using this type of cabling [4]

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7 (a) (i)
- at least one computer used to "serve" …
- … other computers are referred to as "clients"
- server provides services / applications etc. …
- … which may be requested by clients [2]

(ii) any **two** from:

- files and resources are centralised
- creation of security / manage security
- user needs user name and password to access network
- centralised back-up
- intranet capability
- Internet monitoring
- Clients can be less powerful machines, therefore less expensive to buy
- Saving resources on server reduces the burden on the client [2]

(b) router [1]

(c)

Statement	Sequence number
The requested web page is displayed on the client computer	**5**
The user clicks on the hyperlink and the web page is requested from the web server	**1**
The requested web page content is transmitted to the client computer	**3**
The client computer processes the JavaScript code using the web browser software	**4**
The web server locates the requested web page	**2**

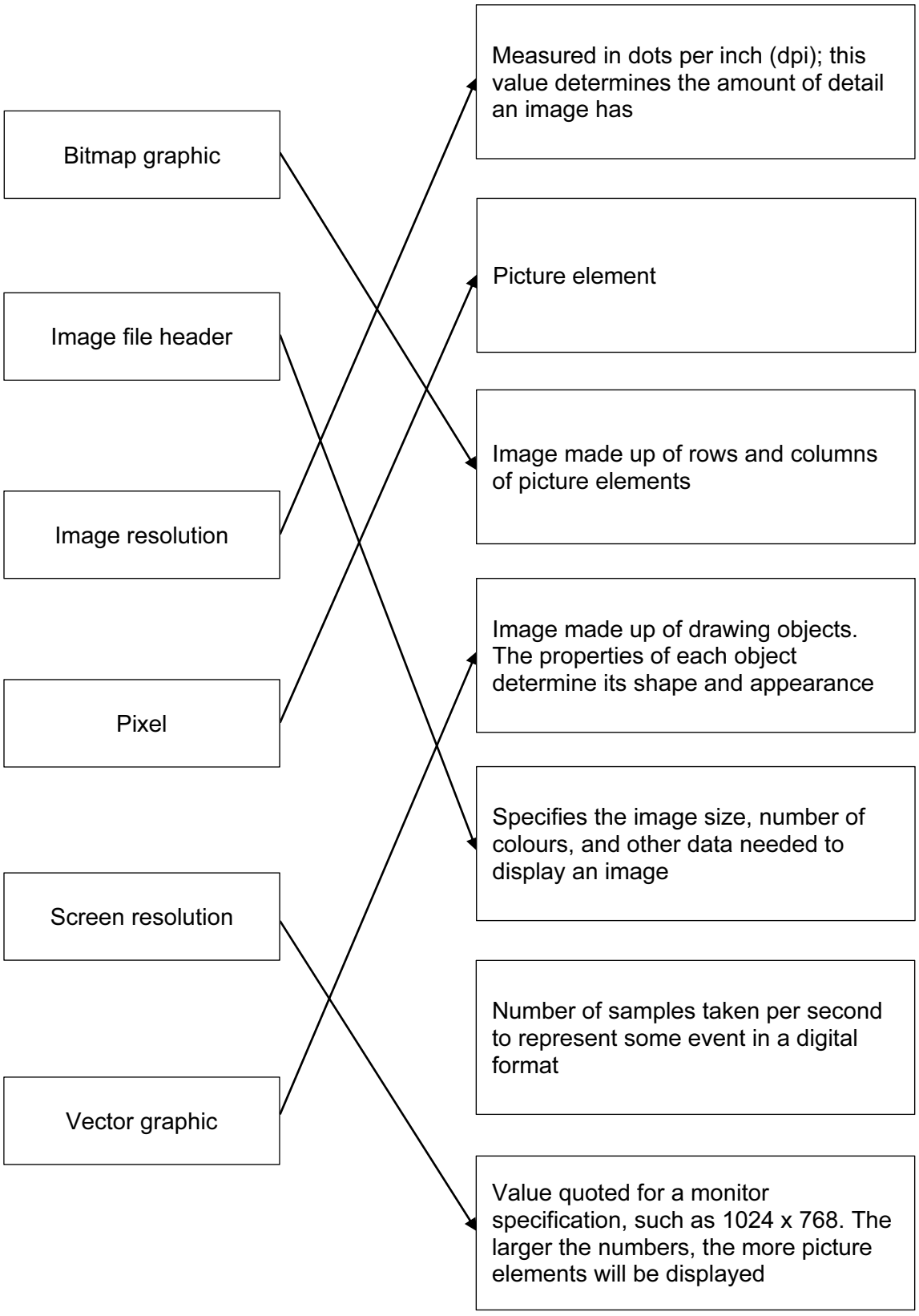
[5]

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8 (a)



1 mark for each correct line, two lines from one box is incorrect [6]

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(b) (i) $\frac{512 \times 256}{8 \times 1024}$ = 16 KB

1 mark for numerator + 1 mark for denominator [2]

(ii) so it is possible to estimate how many images can be stored / to decide if it can be sent as an email attachment [1]

9 (a) One mark for validation, one mark for verification.

Validation

– check whether data is reasonable / meets given criteria

Verification

– method to ensure data which is copied / transferred is the same as the original
– entering data twice and computer checks both sets of data
– check entered data against original document / source [2]

(b) Any **four** from:

– parity can be even or odd
– parity check uses the number of 1s in a binary pattern
– if there is an even / odd number of 1s, then the parity is even / odd
– following transmission …
– parity of each byte checked
– a parity bit is used to make sure binary pattern has correct parity
– example: 1 0 0 1 0 1 1 1 has parity bit set to 1 in MSB since system uses odd parity (original data: 0 0 1 0 1 1 1 which has four 1 bits) [4]

10 (a) any **two** from:

– malicious code / software / program
– that replicates / copies itself
– can cause loss of data / corruption of data on the computer
– can cause computer to “crash” / run slowly
– can fill up hard disk with data [2]

(b) any **two** from:

– checks for boot sector viruses when machine is first turned on
– when an external storage device is connected
– checks a file / web page when it is accessed / downloaded [2]

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11

Statement	Interpreter	Compiler
This translator creates an executable file		✓
When this translator encounters a syntax error, game execution will halt	✓	
The translator analyses and checks each line just before executing it	✓	
This translator will produce faster execution of the game program		✓
Use of this translator makes it more difficult for the user to modify the code of the game supplied to the user		✓

1 mark for each correct row [5]

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