AQA

ASSESSMENT and QUALIFICATIONS ALLIANCE

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GCE

Computing

Unit CPT1

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Unit 1: Computer Systems, Programming and Network Concepts

The following notation is used in the mark scheme:
- ; means a single mark;
- / means alternative response;
- **A** means acceptable creditworthy answer;
- **R** means reject answer as not creditworthy;
- **I** means ignore;
- **BoD** means benefit of doubt.

1. (a) (i) electrical/electronic/physical components/parts of computer;
I any example **I** ' … can touch … ' **1**

(ii) programs/sequences of instructions (which run on the hardware);
A code; **R** application **1**

(b) software; **1**

(c) hardware; **1**

A correct term circled; **R** abbreviations

Total 4

2. (a) (i) 23;
1

(ii) 17;
1

(b) (i) 1010 0001;;

one mark for correct ASCII code, one mark for odd parity bit (follow through) **2**

(ii) 11010 00010 *OR* 01010 00011 *OR*

allow stop bit to be 1 or 0 but stop and start bits must be different

follow through if (i) wrong

01000 01011 *OR* 11000 01010; *Allow both ways round for transmission* **1**

Total 5

3. (a) network adapter/network (interface) card/Ethernet card;

A a named card type eg Token Ring Card; **R** NIC *on its own* **I** hub **1**

(b) (i) A=Ring (network); B= Bus (network); **2**

(ii) higher transmission rates possible with high traffic/performance of B degrades with heavier traffic;

R quicker no collisions; **A** fewer collisions;
transmission of messages is simple (as messages travel in one direction only); **max** **1**

(iii) easy/inexpensive to install;
easy to add more stations/computers/nodes/clients without disrupting network;

R users instead of node

R cable breaks, **R** computer breaks **max** **1**

(c) (i) a protocol is a set of rules; **A** set of procedures; **A** a rule;

I *other terms unless talked out in rest of sentence* **1**

(ii) to ensure successful communication/transmission/interaction;

(between different computers)

answer must imply communication/receiving data not hardware linking

R *sending data only* **R** *if connection only* **1**

Total **7**

4. (a) 1 – main memory;

2 – processor; **A** CPU;

3 – I/O port;

4 – address bus;

5 – control bus;

R *anything else* **5**

(b) (i) (processor) executes instructions; **R** data **R** programs

BoD 'executes data and instructions';

(main memory) stores program/data currently in use;

A temporary storage of data/programs; **R** information **R** application

(secondary storage) holds programs/data/files for long-term/non-volatile storage;

R application **I** virtual memory

A permanent storage of data/programs **R** information **R** backup **3**

(ii) clock/timing; reset; interrupt ACK; interrupt request; bus grant; bus request;

status; I/O write; I/O read; Memory read; memory write; transfer ACK;

A interrupt; **A** transfer request; **A** examples
read/write on its own not enough **max** **2**

(iii) instruction(s); address(es); **max** **1**

Total **11**

5. (a) (i) Const Max = 200; **1**

(ii) EndOfList := False / Ptr := 1 / EndOfList := True / Ptr := Ptr +1;
accept without : **1**

(iii) If Ptr > Max Then …../ If EndOfList (Then) …..; **1**

(iv) While WantedName < > Member[Ptr].Name And Not EndOfList Do …;

A While …. End While; **1**

(b) (i) Tmember; **A** (Type) Tmember = Record; **1**

(ii) WantedName; **A** WantedName: String; **R** *whole line* **1**

(iii) EndOfList; **A** (Var) EndOfList: Boolean; **1**

(c) when the programmer wants to change the value it only needs changing in the declaration;

can't be changed accidentially/by the program; easier to understand/debug program;

A less error prone; **R** easier to read; **1**

(d) (i) because the age would need to be manually updated when it's someone's birthday;

A an answer which implies age changes value; **I** lack of accuracy **1**

(ii) store the date of birth and calculate the age from that and today's date;

A date of birth *on its own* **1**

(e) TRUE and FALSE / 1 and 0 / 0 and –1 / on and off / Yes and No / high and low; **1**

Total 11

6. (a) picture is broken into a grid of pixels; **A** diagram; **R** dots **R** parts **R** screen
for each pixel a number/value is stored; in memory;

number/value represents a colour; **R** *black/white answers* **max** **2**

(b) the graphic can be enlarged/reduced/zoomed in/out without distortion;

can take up much less (memory) space / smaller file size;

image is more accurate; smooth edges/lines; can produce 3D images; **max** **1**

Total **3**

7. (a) the number of times the amplitude is measured per second/unit of time/sampling rate;

the number of bits available to store the amplitude measurement/sampling resolution;

R amount of memory **R** bits per second

R *all other factors* **R** *references to playback only* **2**

(b) editing out noise/wrong notes post processing; sounds/data can be changed/ edited;
stored/transmitted digitally; **I** compression **1**

(c) producing/creating/generating audio signals/sound(s) by computer/digitally;

(which sound like an instrument/voice) **1**

R editing/changing

Total **4**

8. (a) (i) direct;

(ii) indirect; **2**

(b) data is encoded information;; data is numbers / characters without meaning;

data is raw facts; something submitted for processing; data is input/stored;

information is output;

information is meaningful/useful/processed/analysed data;;

A information = data + structure;; **max** **2**

Total **4**

9. (a) (i) a compiler translates the whole source code;

into object code; **A** machine code (instructions); **A** executable file;~

if implied that compiler executes then talked out **max** **1**

(ii) Interpreter translates line by line; as it executes/runs;

if object code created then talked out **max** **1**

(b) (i) use compiler when execution should run as fast as possible;

when development is finished; when giving program to end user to run;

to protect source code from end user interference;

to turn program without translator/compiler on computer; **max** **1**

(ii) use interpreter during development time/testing/debugging/finding/correcting mistakes;

to support platform independence;

(e.g. Java → bytecode, bytecode interpreted) **max** **1**

(c) assembler translates assembly/low level program;

compiler translates high level program;

assembler maps 1:1; compiler maps 1:many; **max** **1**

Total **5**

10. (a)

Ptr	Temp	List									
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
		43	25	37	81	18	70	64	96	52	4
1	43	25	43								
2	43		37	43							
3											
4	81				18	81					
5	81					70	81				
6	81						64	81			
7											
8	96								52	96	
9	96									4	96
10											

ignore Ptr & Temp columns

1 mark for each of rows 1, 2, 4, 5, 6, 8, 9 **7**

(Final list 25, 37, 43, 18, 70, 64, 81, 52, 4, 96)

(b) control will pass to the instruction after Endwhile;
/the instruction/command/statement after Endwhile will be executed;
program will exit while-block; loop stops;
A algorithim stops; **R** program stops; **max** **1**

(c) (i) 25; *if part (a) not fully correct allow follow through: or lower of [1] & [2]*

(ii) 81; *only allow follow through mark if the list at the end of part(a) is still a partially sorted list*

(iii) 96; *must be 96 in all cases* **3**

Total **11**