

Barbados S.D. A. Secondary School
Qualifying Examinations 2005
Information Technology

Time 2 hrs

Answer ALL questions

1. (a) Name the TWO main components of the Central Processing Unit. (2 marks)
(b) For the two components named in part (a), discuss their MAIN functions. (2 marks)
(c) Give ONE difference between PROM and EPROM. (1 mark)
(d) What is 'half-duplex transmission'? (2 marks)

2. (a) You have saved a file on diskette. You later find that although you see the file listed, you cannot open the file from the diskette. Give ONE possible cause for this problem. (1 mark)
(b) One of the things done in a high level format is the creation of a File Allocation Table. What is the purpose of the File Allocation Table? (1 mark)
(c) With reference to a hard disk arrangement, give the difference between a track and a cylinder. (1 mark)
(d) A hard disk system has six disk surfaces, with one moving head for each surface. A certain track has ten sectors forming a ring, each sector carrying $\frac{1}{2}$ K-byte. How many
(i) bytes are there in each $\frac{1}{2}$ K-byte sector? (1 mark)
(ii) K-bytes are there in the entire cylinder? (1 mark)

3. (a) An old 30-pin memory module (SIMM) was capable of providing one byte at a time to the CPU. A 32-bit machine would require four of these to work together in a single bank. Explain why this is so. (2 marks)
(b) "Integers are good for representing discrete data. Real numbers and floating point values are good for representing continuous data." Explain these statements. (2 marks)

4. (a) Explain why magnetic tape is a serial access medium. (1 mark)
(b) Explain why a floppy disk is considered a direct access medium. (1 mark)
(c) What is 'microfilm'? (1 mark)

5. (a) Give TWO applications for the use of an Optical Mark Reader (OMR). (1 mark)
(b) Give TWO meanings for the abbreviation OCR. (2 marks)
(c) Explain why a monitor screen specified as 1024 x 768" is expected to give a clearer picture than one specified as "640 x 480". (1 mark)
(d) Give ONE advantage and ONE disadvantage of a touch screen as compared to the use of a mouse. (2 marks)

- (e) Give the difference between “custom software” and “customized software”. (1 mark)
 - (f) State ONE similarity in the operation of Optical Mark Readers and bar codes. (1 mark)
 - (g) Explain the difference in operation between a line printer and a character printer. (1 mark)
6. (a) Using 8-bit binary representation, give the
- (i) binary representation for the decimal number 10 (1 mark)
 - (ii) Give the decimal equivalent for the binary number 01001001. (1 mark)
 - (iii) Add the two binary numbers 00110011 and 00100110 giving the answer as a binary number. (1 mark)
 - (v) BCD representation of 10 (1 mark)

7. Write an algorithm or program to read in two numbers and find the average of the numbers.

8. (a) List TWO advantages of secondary storage for long term storage of data, as compared to using the computer’s main memory. (2 marks)
- (b) (i) Identify TWO input devices that are regularly used at Point-Of-Sale terminals, and briefly describe how they function. (2 marks)
- (ii) List TWO locations at which Point-of-Sale terminals are helpful. (2 marks)
- (c) Explain the difference between ‘data’ and ‘information’. (2 marks)

9. Complete the following paragraphs, using the terms supplied in the listing below.

LIST OF TERMS (Some or all may be used): arithmetic and logic unit, backing store, control unit, cylinders, heads, internal memory, program, sectors, tracks.

- (a) In order to execute a (A) _____ which is stored on the computer, the computer must read the instructions from its (B) _____ into its (C) _____. The (D) _____ then picks each instruction in turn, passing any mathematical or logic operations over to the (E) _____ until the entire sequence is completed. (5 marks)
- (b) The data stored on a high density 3 ½ inch diskette is arranged in 80 circular (F) forming rings on the surface of the disk. Each ring is divided into 18 (G) _____ having ½ K-byte each. A hard disk has multiple surfaces. The corresponding rings on those surfaces are directly above and below each other. On a hard disk, these rings, one above the other, are said to form (H) _____. (2 marks)
10. (a) With regard to data storage, what is the difference between a byte and a word? (2 marks)

- (b) With respect to information being read from a hard disk, what is the purpose of a BUFFER? (1 mark)
- (c) Suggest ONE use for which a DVD is more suitable than a CD. (1 mark)
- (d) The information contained in ROM (Read Only Memory) cannot be changed. What is the purpose of the ROM? (1 mark)

12. Write one algorithm using pseudocode to do the following sequence of tasks:

- (a) Read in the values of two numbers.
- (b) Find the product of the two numbers.
- (c) Find the sum of the two numbers.
- (d) Check whether the product is bigger than the sum.

If the product is bigger, it must print a message to say so, and if the product is not bigger it must print a message saying that the product is not bigger. (6 marks)

13. (a) DIFFERENCE = 0
 Input A, B
 If A <= B Then
 DIFFERENCE = A - B
 Else
 DIFFERENCE = B - A
 Endif
 Print DIFFERENCE

What is printed by the algorithm above if the input values are the following?

- (i) 20 30 (1 mark)
- (ii) 100 100 (1 mark)
- (iii) 50 10 (1 mark)

- 14. (i) Write a structured algorithm which prompts a user to enter an integer value which is then stored in a variable N. The algorithm must then print each integer from 1 to N and its corresponding square. Each output line must show the integer and its square. You may assume that the user would enter an integer value. (5 marks)
- (ii) Modify the algorithm in (i) to determine the sum of all the squares. Print this sum if it is less than or equal to 1000. Otherwise, print the following message:

THE SUM IS GREATER THAN ONE THOUSAND

(5 marks)

Total marks 10

- 15. (a) Write an algorithm which reads three values, a, b and c and prints the largest of the three. (4 marks)
- (b) This part is based on the algorithm given below:
 set A to 3

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set B to 5
set SUM to 1
while A <= 50 do
    A=A+B
    B=B+A
    SUM=SUM+B
endwhile
print SUM
stop

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Using the algorithm above:

- (i) Copy and complete the trace table which follows. (5 marks)

A	B	SUM
3	5	1

- (ii) State what is printed by the algorithm. (1 mark)

Total 10 marks

16. Print a conversion table to convert pounds to grams from 1 lb to 20 lbs. (1 pound = 454 grams).

17. Match EACH characteristic, listed A to H below with the MOST appropriate device. Write the letter (A, B, etc.) to represent the characteristic and next to EACH letter write the name of the device that matches it.

CHARACTERISTIC DEVICE

A.	Modulates and demodulates signals	Plotter
B.	Accepts voice inputs	Keyboard
C.	Allow users to input architectural plans	Modem
D.	Reads in graphics data	Graphics tablet
E.	Used for printing architectural plans	Microphone
F.	Used for entering text documents	Barcode reader
G.	Retrieves pricing data from grocery items	Joystick
H.	Used to move the cursor	Scanner

(8 marks)

18. In order to secure its data, a company uses the following method for encrypting text:

A letter is replaced by the letter five letters later in alphabetical order. For example, the letter "A" is replaced by "F", "B" is replaced by "G". and so on. Note that the letter "A" is considered to follow the letter "Z".

(i) What would the word "ESSAY" be stored as? (2 marks)

(ii) What is the meaning of the following text?

N LTY NY

(2 marks)