

School Certificate Examination 1998 Model Answers

Multiple Choice

1. Which combination of keys do you press to restart (warm-boot) an IBM PC compatible computer?
d. Ctrl + Alt + Del
2. Which of these is not a name of an operating system
b. GUI
3. The size of a computer memory typically refers to the
d. amount of RAM
4. The decimal number 25 when converted to binary is
b. 011001
5. How many bytes are in 1kb
c. 1,024
6. The hexadecimal number 40 when converted to decimal is
a. 64
7. Which DOS command will delete only the files with the extension LED ?
d. DEL *.LED
8. From the DOS prompt, the command MD \WP\SCHOOL is typed in. This
b. can be issued from anywhere provided that WP must already exist
9. Which of these is a device which converts analog signals to digital signals, and vice versa ?
c. A modem
10. The spreadsheet entry F5 + F7 will be treated as
a.
a. label
(note: to be treated as a formula the entry must be with an equal sign =)
11. A record is generally defined as a collection of
b. fields
12. A label on a computer says 80286. This label refers to the
a. type of processor used by the computer
13. The diagram below shows the first few cells of a spreadsheet
Using the values in the above diagram, the answer for B2*A3-A2/B1 is
 $4*10-8/4 \rightarrow 38$
b. 38
14. Given the following Qbasic program, How many times would the phrase "MALO E LELEI" be printed?
c. 9
15. What will be the output produced by this program ?
d. (the reason this is the output is:
i. A single line for the printout because a semicolon is used after Total
ii. A large gap before printing the value of AVG because a comma "," is used instead of a semi-colon

General Computer Knowledge

- a. Explain why the binary number system is the most suitable to be used by computers.

The binary number system represents the only two states that exists in an electrical device (ON and OFF.) By using the binary number system, we have a symbolic method for representing the state of the electronic device's activities.

- b.1. Write down the name of part A, part B and part C

A. Input Devices, B. Output Devices, C. Storage Devices

- b.2. Indicate on the diagram the flow of data to and from the Central Processing Unit

- b. 3. The Central Processing Unit comprises three main parts. They are memory and two other parts. Name these two parts and briefly outline their function.

Control Unit.

Manages movement of instructions through the CPU

ALU, Arithmetic Logic Unit

Performs Arithmetic Calculations and Logical comparisons

- c.. Explain the terms: BIT and BYTE

A bit is the unit or Binary Digit. A BYTE is a group of 8 bits

d.. A program used to copy one floppy disk to another uses a "buffer" of size 400Kb to temporarily store data. How many times would this program use the buffer while copying a 1.4 Mb disk ?

→ 1.4Mb / 400Kb	# The question requires finding how many 400Kb's in 1.4Mb
→ $1.4 * 1024\text{Kb} / 400\text{Kb}$	# Convert the numbers into the same Unit
→ $1433.6 / 400\text{Kb}$	# Simplify the problem
→ 3.584	# The division provides the answer 3.584

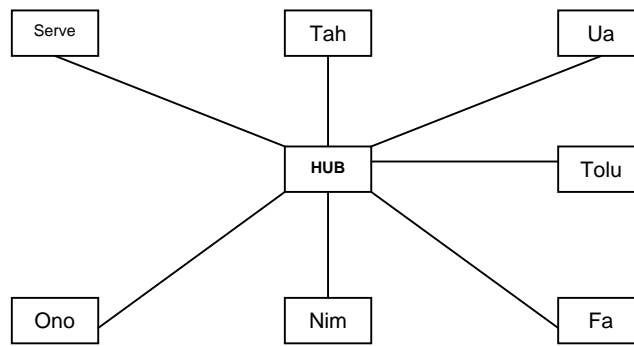
In reality we have to use the buffer at least 4 times

E List two types of topology commonly used in a Local Area Network (LAN)

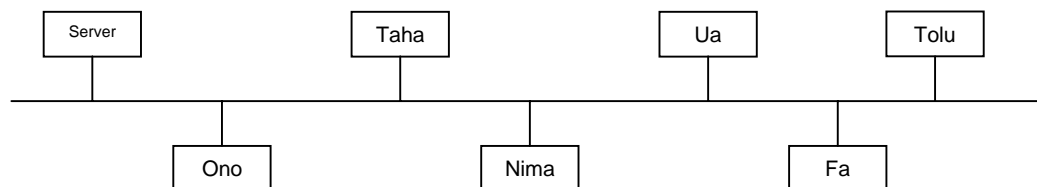
- (a) Star
- (b) Bus

A Topology describes the configuration formed when two or more computers are connected to each other through a network.

Queen Salote's network is described as a Star topology because all the computers are connected to each other by being cabled to a central location (HUB.) When we pull this diagram out, the computers stretch out, leaving a hub at the center (much like a star at the center and lights coming out.)



The Bus topology has a single line (bus line) that goes from one side of the network to the other, and all computers are connected to this line.



Question 2: Hardware

A 1. How can you tell that this is a Double Density (DSDD) floppy disk ?

DSDD floppy disks have one notch, HD floppy disks have two notches (one on the left and right hand side.)

A 2. In general, what is the capacity of the DSDD floppy disk ?

Answer: 720Kb

In reality the diskette can handle 1 Megabyte of data, but the way IBM PC's format the disk leaves only 720Kb accessible, available for use.

A 3. What is the purpose of the part labelled notch A ?

The notch A is used for "Write Protecting" data on the diskette. When the notch is open (like audio tapes) then computers will not write to the diskette, the diskette is "write-protected". When the notch is closed, then the computer can write to the diskette.

A 4. What is the purpose of the part labelled latch B ?

The latch automatically closes when the diskette is removed from the disk-drive. This was designed to protect the disk-media inside from dust and fingers.

B. Give TWO differences between a serial and parallel interface.

- (i) Sending Data. The serial device sends data one after the other, the parallel device sends data bits in parallel (together)
- (ii) Distance. Serial data can be sent further than parallel data. This is because parallel data has to arrive simultaneously (all at the same time) which becomes increasingly difficult the further the distance the data has to be sent.

C. List FOUR advantages of Intel Pentium processor over an Intel 486-SX processor

- (i) Math Co-processor. The Pentium has mathematic capabilities for handling decimal values built into the chip, whereas the SX class chips do not. This significantly increases the Pentium's ability to perform complex calculations.
- (ii) Speed. The Pentium chip is faster than 486 machines
- (iii) Cache. The Pentium chip has two 8K cache compared to the 486 having only one 8K cache. The cache speeds access to information and improves the speed of the processor.
- (iv) Input/Output BUS. The Pentium has a wider bus to the outside world 64 bit (compared to 32 bit for the 486.) The wider bus means more information can be sent from and received by the CPU, essentially doubling the information that can be transferred at any given time.
- (v) Power Management. The Pentium chip has built power-management abilities which means it can be set to slow or halt some system components when the system is idle or performing non-CPU-intensive tasks, thereby lessening power consumption. Lowering power consumption lowers costs of electricity and also lowers the heat that can be generated inside computers.
- (vi) *Branch Prediction*. *Branch prediction* is a technique in which the microprocessor immediately evaluates an *if-then* branch. The Pentium immediately loads into the instruction pipeline the instructions controlled by either the *if* portion of the branch or the *then* portion of the branch, resulting in faster system performance.

D. List TWO peripheral devices commonly connected to the computer via the parallel port

- i. Printers
- j. External CD-ROM

E. The size of the Central Processing Unit (CPU) had been reduced from a room full of various electronic parts to one square centimeter.

Why is it not practical to reduce the size of input and output devices to the same scale ?

Some input devices have been reduced significantly but since many input / output devices are designed to interact (be used) by humans there is a limit to how small the device can be made before it is impossible for the intended users to make use of it.

F. Explain the difference between short-term and long-term memory

Short-term memory is lost when electricity is turned off, whereas long-term memory is retained even after power is lost.

G. Name TWO devices which can be used for input only

- i. Mouse
- ii. Keyboard
- iii. Scanner
- iv. Digital Camera
- v. Microphone

H. Most keyboards have two sets of number keys 0 to 9. Why is this so ?

The top row of keys is used when touch-typing. The 2nd set of keys (usually to the right hand side) the numeric-keypad is used by people who have to input a lot of numbers, like when entering data into a database or spreadsheet.

I. A non-impact printer operates differently from an impact printer. Briefly explain how they differ. Name an example of each type of printer.

Impact: dot-matrix, daisy-wheel
Non-Impact: laser, inkjet, thermo

Impact printers generate characters on paper by impacting (hitting) the ribbon holding ink onto the paper. The impact pushes the ink onto the paper leaving the desired character or image.

Non-impact printers create the image by a process that does not require striking the ink or the paper.

More Information: Laser printers create the image to be printed on an image photosensitive drum when the paper passes across the drum an electrical charge put onto the paper pulls the dry ink away from the drum and onto the paper. The paper then passes over a heating device which heats the paper and melts the ink onto the paper.

More information: Ink jet, Bubble jet printers work by 'spitting' the ink onto the paper as the paper passes under the ink holder. The ink is stored in a cartridge and the printer forces the ink out like a bubble and shoots it at the paper.

Software and Operating System

A. What do the following abbreviations stand for ?

BIOS – Basic Input Output System
GUI – Graphical User Interface

B. You are required to create the directory structure shown below in drive C.

- i. If the DOS prompt is C:\>, write a series of commands that will produce the directory structure shown above.

Md sub1
Md sub1\sub3
Md sub1\sub4
Md sub1\sub4\sub5
Md sub2

- ii. For each command shown below, indicate whether there is a problem. If so, state the nature of the problem shown above. (DOS prompt remains as C:\SUB1> for all commands)

CD SUB2 – Problem: Yes, Reason: sub2 does not have a direct path from inside sub1
RD SUB4 – Problem: Yes, Reason: sub4 is not empty so it can't be removed
MD SUB5 – Problem: No
REN SUB3 SUB6 – Problem: Yes, Reason: REN (rename) does not work on directories.

C. List any TWO of the four main functions of an operating system.

- i. Memory Management
ii. Process Management
iii. File Management
iv. Device Management

D. What is a computer virus ?

A computer virus is a program designed to cause problems with other people's computers.

E. The result of a DIR command is shown below.

- i. What is the default drive ?
A → this is shown by the A>DIR B:

This implies that we are sitting in the A> drive when we issue the DIR command to list what is on B:

- ii. On what date was the file DOCUMENT.FOU created ?
4-12-95

- iii. How many files will be listed using the command: DIR *.ONE ?
TWO

F. Explain the reason for each of the following error messages, then indicate the most likely corrective action.

- i. A>CLEARSCR
Bad command or file name

Reason: The command is incorrect and DOS could not find a program file CLEARSCR

Corrective Action: use CLS

- ii. A>COPY *.* B:

Not ready reading drive B
Abort, Retry, Fail?

Reason: No diskette is in drive B, or the diskette in the drive is faulty

Corrective Action: Insert a formatted floppy disk into Drive B and hit "R" for retry, or hit "A" for abort.

- iii. A>DEL

Required parameter missing

Reason: The Delete command requires further information, additional parameters

Corrective Action: Specify which file or files you wish to delete, eg. DEL filename.txt

Spreadsheet

(left for the user)

Database

1. What is the purpose of having the item Hospital Number in the index card?
This gives the hospital a unique tracking number for each patient so when multiple records have to be kept then the number is used to associate the different records.
2. Give TWO reasons why it will be an advantage for the hospital to convert the manual index card system to an electronic database

- i. minimise duplication of data. By using a computer then separate copies of information are not needed in different locations.
- ii. Speed of access. By using a computer finding records is much faster by using the database's search facilities

B

1. i. How many fields are shown in the table above ?
EIGHT

ii. How many records are shown in the table above?
EIGHT

- iii. List the ID(s) of vehicle(s) registered before 1994?
2, 189
2. List the ID(s) of vehicle(s) which can be considered possible suspect(s) in this case

189
3. List the ID(s) of vehicle(s) which can be considered possible suspect(s) in this case

204, 100, 212, 268
4. List TWO ways of protecting data in the vehicle database from other police officers who are not authorised to access the database

Password protect access to the database
Password protect access to queries in the database
5. Explain why it is important to update databases on a regular basis. Illustrate your ideas by giving one example from the table shown above.

Important to maintain accurate information in the database.

For example, if Pita Kuli sells his car and someone has an accident in the car but runs away. The police are likely to blame Pita even though he has sold the car.

- C. A Form 5 student designs a table to store personal information of students at her school. The structure of the table is shown below:

Give TWO main shortcomings of the table structure shown above. Explain your reasoning clearly.

Name field is too small: Few Tongans have first names that fit in the 8 letter width
Birthdate field would be better as Date field so we can sort by birthdate when necessary
Village would be better as a Text field since we understand towns by their names and not by number
Student_ID would be better as a Number field since it is mostly used for sorting and sorting numbers in a number field.

Programming

- A i. Explain what is a string variable

A string variable can hold "Text" such as letters in the alphabet, or words

- A ii. Explain how we can identify a string variable in a program listing

String variables can be defined by using the DIM statement or by using the postfix notation "\$"

The following are examples of variables that hold strings

Answer\$, name\$, village\$

- B. What do the following lines mean?

- i. 10 REM "Program for TSC – 1998"
The line is a remark, or comment that is ignored by the program but provides documentation (information) for the reader.

- ii. 50 INPUT "Please enter mark"; MARK
The text "Please enter mark" is displayed on the screen. When you enter a number as a response, that number is placed inside the variable MARK

- iii. 70 GOSUB 160

The program will continue (GO) at 160 until it is told to RETURN

- iv. 160 IF MARK > 50 THEN
Check the value stored in MARK and if it is greater than 50 then perform the work after the THEN. If the value is not greater than 50 then perform the work after the ELSE.

- v. 210 COUNTER = COUNTER + 1
Read the value inside the variable COUNTER, add one to it and store this new value inside the variable COUNTER

2. If a value of 85 is entered at line 50, what will be the output produced in line 90?

3. Explain how this program can be stopped

Ctrl + Break. By pressing the keys Ctrl + Break, the Qbasic environment will stop the program.

When prompted by "Another Mark? (Y/N)" you can enter N and the program will stop

4. Explain in your own words the purpose of this program.