COMPUTER SCIENCE 2
0595

JUNE 2021   **ORDINARY LEVEL**

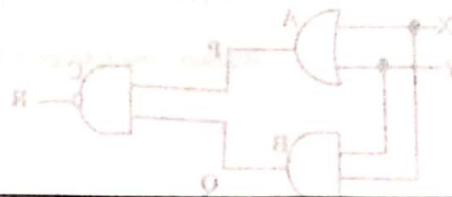| Subject Title	COMPUTER SCIENCE
Paper No.	2
Subject Code No.	0595

Two Hours

Answer any FIVE questions.

All questions carry 20 marks each. For your guidance, the approximate mark for each part of a question is indicated in brackets.

You are reminded of the necessity for good English and orderly presentation in your answers.

In calculations, you are advised to show all the steps in your working, giving your answer at each stage.

Calculators are NOT allowed.

1. (a) (i)   Write the following acronyms in full as used in computing:
              SDLC, RAM, CPU, BIOS, POST.   **(5 marks)**

        (ii) What is a computer port?   **(2 marks)**
        (iii) Name three (03) computer ports and state a device that can be connected
              to each port you name.   **(6 marks)**

    (b) (i)   State what you understand by 'network topology'   **(1 mark)**
         (ii) Draw labelled diagrams for a **Star** network topology and a **Bus** network topology. **(4 marks)**
         (iii) State a difference between a star topology and a ring topology.   **(2 marks)**

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2. (a) Study the following algorithm about student test marks and answer the questions that follow.

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1.    Start
2.    Get Test 1 and Test 2 marks
3.    IF (Test 1 mark < 0 OR Test 2 mark < 0) THEN
3.1.1   Display 'A mark cannot be negative'
3.1.2   Get Test 1 and Test 2 marks
3.1.3   Go back to Line 3
        END IF
3.2.1 Average = (Test 1 + Test 2)/2
3.2.2 Display Test 1, Test 2, Average
4.    Stop
```

        (i)   What is the algorithm expected to compute?   **(2 marks)**
        (ii) State the line numbers with statements that constitute a loop.   **(2 marks)**
        (iii) Using symbols T1 for Test 1, T2 for Test 2, Avg for Average, represent the algorithm as a flowchart. **(6 marks)**

        (iv) State the expected output for the following pairs of marks inputs. Give a reason for each of
              your answers.
              Test 1 = 15, Test 2 = 9
              Test 1 = 8, Test 2 = - 4   **(4 marks)**

    (b) Name and explain the function of three types of computer system buses.   **(6 marks)**

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3. (a) Namondo wants to purchase a printer for her office computer to print **hard copies** of her photographs.
         She wants to know which printer type is cheaper: **Impact** or **non-impact**. She is advised that athough
         impact printers are cheaper, the most important things to consider in buying a printer are
         print quality, and the **cost and rate of consumption of ink.**

         (i)   Which printer is she likely to select? Justify your answer.   **(3 marks)**
         (ii) What do you understand by the terms?
               - Hard copy
               - Impact printer
               - Non-impact printer
               - Print quality   **(6 marks)**

         (iii) State a difference between impact and non-impact printer in terms of their print technology. **(2 marks)**

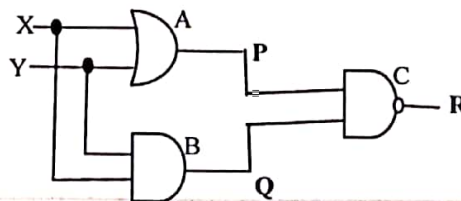   (b) Consider the logic circuit diagram in Figure 1 below:

Figure 1

(i) State the names of the logic gates labelled A, B and C. **(3 marks)**

(ii) Based on Figure 1, copy and complete the truth table in Figure 2.

X	Y	P	Q	R
0	0			
0	1			
1	0			
1	1			

Figure 2

(3 marks)

(iii) Write the logic equations for outputs **P**, **Q** and **R** in terms of X and Y. **(3 marks)**

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4. (a) A team of system developers has identified six tasks described in the table below:

Task No.	Task Description	Task Constraints	Duration (in days)
A	System specification	None	3
B	Try software	Starts after system specification	2
C	Customise Test software	Starts after software trial	4
D	Purchase of Test hardware	Starts after system specification	3
E	Install software	Starts after Hardware Testing	2
F	Train staff	Starts after software customisation.	1

(i) What is the use of Gantt charts in projects? **(2 marks)**

(ii) Copy and complete Table 2 below to produce a Gantt chart. **(6 marks)**

Table 2

Tasks						Days					
	1	2	3	4	5	6	7	8	9	10	11
A											
B											
C											
G											
E											
F											

(iii) Define the terms lag time and critical path as used in project development. **(2 marks)**

(iv) State the critical path of the project above and hence determine the project duration. **(2 marks)**

(b) A school's computer resource centre has stand-alone computers. The school has now decided to connect the computers into a local network and to the internet.

(i) State what you understand by the network terms ISP and Protocol. **(2 marks)**

(ii) Give the name of a protocol that
- governs the movement of data across the Internet.
- is used to access pages on a web server **(2 marks)**

(iii) Briefly explain the following database concepts:
- Primary key
- Field
- File
- Query

(4 marks)

5. (a) In computer security,
   (i) What is the meaning of the term hacking? **(2 marks)**
   (ii) State three measures that can be implemented to prevent hacking. **(3 marks)**
   (iii) List three problems that can result from unethical hacking. **(3 marks)**

   (b) Show all steps in solving the following number representation problems.
   (i) Convert the hexadecimal number 2C into a binary number. **(2 marks)**
   (ii) Convert the octal number 67 into hexadecimal. **(3 marks)**
   (iii) Perform the binary addition $1011_2 + 1101_2$ **(3 marks)**

   (c) (i) State what you understand by backup and give one characteristic of a backup storage device **(2 marks)**

   (ii) Briefly explain the term portability in relation to:
   - storage devices
   - software **(2 marks)**

6. (a) (i) With the aid of diagrams, distinguish between serial and parallel data transmission. **(5 marks)**
   (ii) Briefly describe the following modes of transmission giving an example in each case where they are used: Simplex, half duplex, full duplex **(6 marks)**

   (b) (i) Name and briefly explain the functions of the three main parts of the CPU. **(6 marks)**
   (ii) State three main stages of the machine cycle. **(3 marks)**

7. (a) (i) State the main technological feature that distinguished each of the following computer classifications:
   - 1st generation
   - 2nd generation
   - 3rd generation
   - 4th generation **(4 marks)**

   (ii) In computer programming:
   - What are mnemonics? **(2 marks)**
   - State two disadvantages of using machine code. **(2 marks)**
   - State two differences between a compiler and an interpreter. **(2 marks)**

   (b) One of the health hazards of using computers is RSI.
   (i) Write RSI in full. **(1 mark)**
   (ii) State two body parts that are likely to be affected by RSI. **(2 marks)**
   (ii) What should we do in order to prevent RSI? **(1 mark)**

   (c) (i) State two advantages and two disadvantages of using electronic mail as a means of communication. **(4 marks)**

   (ii) State a difference between intranet and extranet. **(2 marks)**