

Annual Examinations for Secondary Schools 2017

YEAR 11 **COMPUTING** **MARKING SCHEME**

Section A

1. For each **secondary storage**, tick (✓) whether they are magnetic, optical or electronic media.

		Magnetic	Optical	Electronic	
a.	Pendrive			✓	[1]
b.	Hard disk	✓			[1]
c.	CD-ROM		✓		[1]
d.	Tape	✓			[1]
e.	DVD-ROM		✓		[1]

2. For each **computer logic** statement, state if it is **True** or **False**:

a.	1KB is equivalent to 1024 bytes	<i>True</i>	[1]
b.	An analogue device can measure continuous information	<i>True</i>	[1]
c.	2 ³⁰ bytes is the same as 1TB	<i>False</i>	[1]
d.	A mercury thermometer is an example of a digital device	<i>False</i>	[1]
e.	1024 megabytes is equal to 1GB	<i>True</i>	[1]

3. The statements below describe an **Input/Output** device. Name the device which describes each statement:

a.	This is a cursor control device found in notebook computers, located in the middle of the keyboard	<i>Trackpoint</i>	[1]
b.	This type of printer is an impact printer	<i>Dot-matrix</i>	[1]
c.	This printing device is used to print vector graphics	<i>Plotter</i>	[1]
d.	This device is used by banks to ease the processing of cheques	<i>MICR</i>	[1]
e.	This device utilises a light-sensitive detector to select objects on a screen	<i>Light pen</i>	[1]

4. Convert the given numbers to the required equivalent bases.

a.	11001 ₂ to base 16	19	[1]
b.	203 ₁₀ to base 2	11001011	[1]
c.	A3 ₁₆ to base 10	163	[1]
d.	11001010 ₂ to base 10	202	[1]
e.	193 ₁₀ to base 16	C1	[1]

5. This question is about **main memory**:

a. Which two memory technologies form the main memory?

Names: RAM, ROM [1]

b. Give a **difference** between the two memories:

Difference: Volatile and non-volatile (or relevant) [2]

c. Name a **software** which can be found in each memory (**indicate clearly the software and the memory associated with it**).

RAM: OS; ROM: bootstrap loader (or relevant – do NOT allocate marks if memory not named) [2]

6. The fetching of an instruction from memory and its execution is known as the **fetch-execute cycle**. The steps in this cycle are found below with some missing terms. Fill in the missing terms:

a. CU fetches the opcode from memory location indicated by PC

b. CU places opcode in IR

c. CU fetches any required operand

d. CU increments PC to point to next instruction

e. CU activates necessary circuits to execute instruction

f. Go back to step 1 [5]

7. a. Why are **truth tables** used in logic circuits?

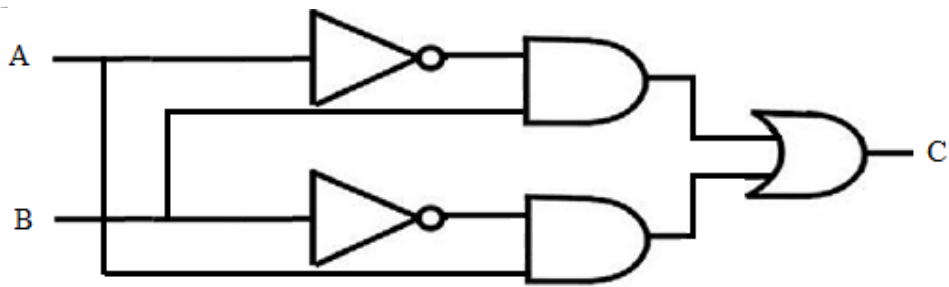
To view inputs and outputs of a logic diagram (or relevant). [1]

b. Study the truth table below and:

i. Draw its equivalent **logic circuit**

ii. Extract the Boolean expression

A	B	C
0	0	0
0	1	1
1	0	1
1	1	0



[3]

ii. **Boolean Expression:** $C = (A'.B)+(A.B')$

[1]

8. a. Give the name of three **transcription (data-entry) errors**, and, using the word 'COMPUTER', give an example for each error.

1st Error: *Omission*

[½]

Example: *COMPUTE (or relevant)*

[½]

2nd Error: *Substitution*

[½]

Example: *CAMPUTER (or relevant)*

[½]

3rd Error: *Transposition*

[½]

Example: *COPMUTER (or relevant)*

[½]

- b. Differentiate between **verification** and **validation checks**.

Verification: *The process to ensure that the data entered matches exactly the original source.*

[1]

Validation: *Automatic computer check to ensure that the data entered is sensible and reasonable.*

[1]

9. a. Using **Two's Complement (2C)** with 8 bits, convert,

- i. To binary:

• 99_{10}

• -111_{10}

99₁₀: *01100011*

[1]

-111₁₀: *10010001*

[1]

- ii. To decimal:

• 11000011_2

• 01110101_2

11000011₂: *-61*

[1]

01110101₂: *117*

[1]

- b. Binary add: $10110 + 01111 + 11111$

[1]

Answer: *1000100*

10. One use of **spreadsheets** is in budgeting.
- Why are spreadsheets better for budgeting than a word-processor?
 - Give another application where spreadsheets can be used.
 - Define and give an example of a label in spreadsheets.
 - Apart from representing data in tabular form, name another way how data can be presented in spreadsheets.
- a. **Answer:** For calculations [1]
- b. **Application:** Invoicing (or relevant) [1]
- c. **Define:** Words (names) describing a set of values [1]
- Example:** Maths_Mark (or relevant) [1]
- d. **Name:** Charts (Accept names of chart e.g. pie chart) [1]
11. **Real-time** and **batch**, are two types of operating systems (OS).
- Give an example of an application where a **critical** real-time OS is used.
 - A characteristic of a real time system is that it supports non-sequential application programs. Give **two** other characteristics.
 - Give an application where batch processing can be used.
 - Apart from managing a great number of utilities, give another example of what a batch OS when used in large computers should manage.
- a. **Example:** Nuclear power stations (or relevant) [1]
- b. **1st characteristic:** Two from:
- *deal with events occurring concurrently*
 - *process and produce a response within a guaranteed specified time interval*
 - *safely-critical systems with hardware redundancy*
- [2]
- c. **Application:** Payroll (or relevant) [1]
- d. **Example:** One from:
- *a wider range of hardware resources*
 - *more users*
- [1]

Section B

12. **Systems Analysis** (system life cycle) is the study, design and implementation of a new computerised system performed in various steps.

a. What is the person that carries out systems analysis called?

Person: Systems Analyst [1]

b. A DVD rental shop is considering changing the current manual system into a computerised one.

Give the name of each of the **seven** steps of systems analysis, and in each step give an example what is done in the DVD rental shop case study.

- Steps**
1. *Project selection and feasibility study*
 2. *Present system study and analysis*
 3. *Design of new computerised system*
 4. *Programming and documentation*
 5. *Implementation and changeover methods*
 6. *Control and review*
 7. *System maintenance*

(Allocate 1 mark for each correct step) [7]

Examples: Allocate 1 mark each for each relevant example if the DVD case study is taken into consideration. [7]

13. a. In programming what is a **looping** construct?

Looping: A loop structure is a code sub-section that requires repetition [1]

b. The **for** loop is one of the iterations used in Java, and is used when predetermined number of repetitions are known before the loop starts executing.

i. **Name** the other **two** iterations used in Java and **explain** the difference between the two iterations.

ii. Using the two named iterations (in i.) write two separate program snippets in Java to display the first ten integers i.e. from 1 to 10 on the screen.

i. **Name:** do-while [½]

Explanation: do-while tests condition at end i.e. executed at least once [½]

Name: while [½]

Explanation: while tests condition at the beginning, so may not be executed [½]

ii. **Name of iteration 1:** while

Snippet:

```
int n = 1; [½]
while (n <= 10){ [1]
    System.out.println(n); [½]
    n++; [½]
}
```

Name of iteration 2: do-while

Snippet:

```
int n = 1; [½]
do { [1]
    System.out.println(n); [½]
    n++; [½]
} while (n<=10); [1]
```

c. **Name the three addressing modes** used in assembly and for each addressing mode give an **example**.

Name 1: Immediate addressing [1]

Example 1: ADD #15 (or relevant) [1]

Name 2: Symbolic addressing [1]

Example 2: ADD tot (or relevant) [1]

Name 3: Direct addressing [1]

Example 3: ADD 50 (or relevant) [1]
