FORM 5  
COMPUTER STUDIES  
TIME: 1h 45min

Name: ___________________________  Class: ____________

Directions to Candidates:

Answer ALL questions in Section A and Section B on this paper;
The use of flow chart template is permitted;
Calculators are NOT allowed;
Good English and orderly presentation are important.

For office use only:

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>Paper Total</th>
<th>Course Work</th>
<th>Final Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>85%</td>
<td>15%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Mark</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section A - Answer all Questions

1 (a) Convert:
   i. The binary number 10110111 to decimal.
   ii. The decimal number 145 to binary.
   iii. The binary number 101100 to hexadecimal.

   10110111 = .........................................................
   145 = .............................................................
   101100 = ..........................................................

(b) Give an example of an 8-bit binary number.
   
   Answer: .............................................................  [3]

(c) Why is 2G_{16} NOT a valid hexadecimal number?

   Answer: ............................................................. [1]

2 For each of the statements below, name the most appropriate I/O device:

   i. Inputting text by people with poor eyesight:

   ii. This output device can produce carbon copies:

   iii. Commonly found in laptops instead of the mouse:

   iv. An output device that produces hardcopy vector images:

   v. Captures the position of a tick (√) on a multiple-choice answer sheet:

   .................................................................  [5]
3 The seven stages of Systems Analysis, not in the correct order, are:

Design of new computerised system, Programming and documentation, Implementation and changeover methods, System maintenance, Project selection and feasibility study, Control and review Present system study and analysis.

Write down the stages in the correct order.

The first and last stages have already been done for you.

Stage 1:  Project selection and feasibility study.
Stage 2:  ________________________________
Stage 3:  ________________________________
Stage 4:  ________________________________
Stage 5:  ________________________________
Stage 6:  ________________________________
Stage 7:  System maintenance.

4 Data Entry Clerk, I.T. Trainer, Programmer, Web Master and Computer Technician are five I.T.-related personnel. Which person from the given list does the following tasks?

i. Creates and maintains web pages:
   ________________________________

ii. Installs and updates software applications:
   ________________________________

iii. Inputs data in the computer for processing:
    ________________________________

iv. Tests and debugs computer programs:
    ________________________________

v. Organizes courses for new staff:
   ________________________________

5 (a) What do the acronyms LAN and WAN stand for?

LAN:  ________________________________

WAN:  ________________________________

(b) Give two advantages of having a LAN system in the school’s administration office rather than standalone computers.

1st Advantage:  ________________________________

2nd Advantage:  ________________________________

(c) The Internet is a typical WAN system. As a student, mention one use that you make of the Internet.

Use:  ________________________________
(a) Use the five terms: **serial numbers, piracy, registration, dongle** and **activation keys**, to complete the paragraph below:

_______________________ refers to the unauthorized copying of computer software. Manufacturers try their best to reduce this form of crime. A hardware device which manufacturers use to reduce such crime is a ________________.

Two anti-piracy software measures that they may use are ________________ and ________________. Buyers are also asked to complete a ________________ form as proof of the authenticity of the software.

---

Study the logic circuit below:

![Logic Circuit](image)

i. Complete the **truth table** below for the circuit given above.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii. Which **single** logic gate could replace the whole circuit?

---

Write whether the following statements are True (T) or False (F):

i. **Process control** is the monitoring and controlling of a task by a computer system:

   ________________

ii. The **ABS** (anti-locking braking system) in a car is an example of process control:

   ________________

iii. A **dedicated** computer system is designed to do more than one task:

   ________________

iv. A **GPS** (global positioning system) is an example of a general-purpose computer:

   ________________

v. Your **PC** (personal computer) is a general-purpose computer:

   ________________
9  (a) Mention two main functions of an operating system.

1st Function: ____________________________________________________________

2nd Function: ____________________________________________________________

(b) For each of the following three statements name the utility program which best fits the description:

i. Gathers separate pieces of the same file together in a disk.

   ________________________________________________________________

ii. Prepares a new disk to accept data.

   ________________________________________________________________

iii. A program which monitors, detects and deletes viruses.

   ________________________________________________________________

10 Below is part of a Pascal program. The program is intended to read a mark between 0 and 100 (both these marks being valid marks), and output Distinction, Merit or Fail according to the inputted mark. However it has one error in line 3.

   (Line numbers are included to help you refer to the instructions.)

Line 1: Writeln(`Enter a mark between 0 and 100: `);
Line 2: Readln(Mark);
Line 3: If (Mark >= 0) AND (Mark >= 100) Then
Line 4: Begin
Line 5:   Case Mark Of
Line 6:     75..100  : Writeln(`Distinction`);
Line 7:     50..74   : Writeln(`Merit`);
Line 8:     0..49    : Writeln(`Fail`);
Line 9:   End; {of Case}
Line 10:   End {of If}
Line 11:   Else
Line 12:   Begin
Line 13:     Writeln(`You entered a wrong mark`);
Line 14:   End; {of Else}

(a) i. Write the correct instruction for line 3.
ii. Write down whether the error is syntax, run-time or logical error.
iii. If line 3 is corrected, what will be outputted if the mark entered is 61?
iv. Write the name of the variable used in the program.

   i. Corrected line 3: ____________________________________________________
   ii. Type of error: _____________________________________________________
   iii. Output: _________________________________________________________
   iv. Variable name: ____________________________________________________

(b) Which one of the following constructs (items) was NOT used in the program above?

   Sequence, Condition, Loop

   Construct not used: ____________________________________________________
11 (a) Give the names of the three translators used with programming languages.

1st Translator: 
2nd Translator: 
3rd Translator: 

(b) From the translators you listed in question (a) above:
   i. Which one is used for translation of a low-level language?
   ii. Which one converts and executes one instruction at a time?

   i: 
   ii: 

Section B – Answer BOTH Questions

12 (a) The following database table shows information on five employees. Study the table and then answer the questions below.

<table>
<thead>
<tr>
<th>Name</th>
<th>Surname</th>
<th>ID number</th>
<th>Job</th>
<th>D.O.B.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter</td>
<td>Cini</td>
<td>123456</td>
<td>Clerk</td>
<td>23/5/1956</td>
</tr>
<tr>
<td>Mary</td>
<td>Cutajar</td>
<td>34167</td>
<td>Supervisor</td>
<td>1/3/1967</td>
</tr>
<tr>
<td>Linda</td>
<td>Formosa</td>
<td>456781</td>
<td>Manager</td>
<td>9/8/1981</td>
</tr>
<tr>
<td>Melanie</td>
<td>Abela</td>
<td>8278</td>
<td>Clerk</td>
<td>10/10/1978</td>
</tr>
<tr>
<td>Gordon</td>
<td>Hili</td>
<td>901268</td>
<td>Messenger</td>
<td>4/12/1968</td>
</tr>
</tbody>
</table>

   i. Write down one field name.
   ii. Which field would be a suitable key field (primary key)?
   iii. What is the operation of selecting particular information called?
   iv. If the table is used to work out the weekly employee wages, what other important field should the table contain?
   v. If the table above is linked to some other table, what is this link called?

   i. Field name: 
   ii. Key field: 
   iii. Operation: 
   iv. Other field: 
   v. Link: 
(b) The diagram below shows the incomplete generic flowchart of the **Repeat … Until loop**. Complete the diagram by drawing the missing symbol and include the appropriate text inside the symbol that you drew.

![Flowchart Diagram]

(c) The following is an incomplete Pascal program. It asks the user to **enter** the length of one side of a square, **calculates** its area and **displays** it. The side entered may contain a decimal point (eg: 13.48). The program **repeats** these tasks until the user presses the ‘N’ key.

i. Study the program and then **complete** it by inserting the missing words in the four dotted empty boxes.

```
Program annual_2011;
Var
    Side, Area : ;
    Stop : Char;
Begin
    Repeat
        Writeln('Enter the side of a square: ');
        Readln ( );
        Area := Side * Side;
        Writeln ('The area of the square is : ', );
        Writeln ('Press the N key if you want to stop the program ');
        Readln (Stop);
    Until Stop = ;
End.
```

ii. Write down the Pascal built-in **function** that may be used instead of: `Side * Side`

**Function:** `.`

[7]
(a) The following are the four main steps of the **Fetch-execute cycle**. However the steps are NOT in order. Write them down in the **correct order**.

- Obey the instruction
- Repeat from step 1
- Interpret the instruction
- Get an instruction from memory

Step 1: __________________________________________

Step 2: __________________________________________

Step 3: __________________________________________

Step 4: __________________________________________

(b) The **ALU**, **RAM**, **CPU** and **ROM** are components of a computer system.

i. What do the **four acronyms** stand for?

   - **ALU**: __________________________________________
   - **RAM**: __________________________________________
   - **CPU**: __________________________________________
   - **ROM**: __________________________________________

ii. Which of the two types of memory mentioned above is said to be **volatile**?

   **Volatile memory**: __________________________________________

iii. Besides the ALU what other **component** (unit) forms part of the CPU?

   **Other component**: __________________________________________

(c) **Label** the blocks in the diagram below to form a simple computer system. Draw **arrows** between the blocks to clearly show the flow of data.

**Diagram:**

```
   [ ]   [ ]   [ ]
   [ ]   [ ]   [ ]
   [ ]   [ ]   [ ]
```