FORM 5 (Option) COMMERCE  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:

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<th>Question</th>
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Section A - Answer all Questions

1 Write whether the following statements are True (T) or False (F):
   i. A general-purpose computer is intended to do one task only: ________________
   ii. Mobile phones are considered as general-purpose computers: ________________
   iii. An embedded system is a computer system designed to do one or a few dedicated functions: ________________
   iv. Dedicated computer systems need special software to function properly: ________________
   v. DVD players are dedicated computer systems: ________________

2 (a) A computer stores integers in two’s complement form in 8 bits. The decimal numbers A and B are as follows: A = 120, B = 70, while C = A – B.
   i. Convert A and B to binary.
   ii. Find the value of C using two’s complement subtraction.

   A = ________________
   B = ________________
   C = ________________

Working Space

(b) The ASCII code for letter K (uppercase) is 75 in decimal. What is the ASCII code in binary for letter R (uppercase)?

   R = ________________

Working Space
3  The **Boolean expression** for a particular circuit is:

\[ X = (A + B)(\overline{A} \cdot C) \]

i. Draw the **circuit** for this Boolean expression.

ii. Draw the **truth table** for this circuit.

**Circuit:**

**Truth table:**

4  Use appropriate computer terms for each of the following statements to fill in the table below:

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>i.</td>
<td>Generic software that includes a combination of text, audio, still images, animation and video:</td>
</tr>
<tr>
<td>ii.</td>
<td>The process of altering/modifying a digital image on a computer:</td>
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<tr>
<td>iii.</td>
<td>A small sized computer, often with an in-built diary application and few other functions such as an address book:</td>
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<tr>
<td>iv.</td>
<td>Software used for the creation of a house plan:</td>
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<tr>
<td>v.</td>
<td>The creation of documents, such as a flyer, using a page layout software on a computer:</td>
</tr>
</tbody>
</table>
5 (a) I.T.-related personnel have different roles as part of their duties. Which person does the following tasks?

i. Sets up a computer system: ______________________________

ii. Loads printer with paper: ______________________________

iii. Defines the I/O requirements of a new system: ______________________________

(b) The use of computers in society has its negative and positive effects. Name an advantage and a disadvantage of computers in medical diagnosis.

Advantage: __________________________________________

____________________________________________________

Disadvantage: ________________________________________

____________________________________________________

6 The Data Protection Act became law in Malta in 2001.

(a) i. Briefly explain what the Data Protection Act (DPA) is.

ii. To whom does this Act apply?

DPA: ____________________________________________

____________________________________________________

Applies to: ________________________________________

____________________________________________________

(b) Give three important principles of the Data Protection Act.

1st Principle: ______________________________________

____________________________________________________

2nd Principle: ______________________________________

____________________________________________________

3rd Principle: ______________________________________

____________________________________________________

7 (a) Grandfather, father and son files is a method used in computing to generate files for security purposes. What type of security do the generations of files provide?

Security: __________________________________________

____________________________________________________
(b) With the aid of a diagram, describe how these files are generated.

Diagram:

Description: ____________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________
______________________________________________________________________

8 (a) i. What is the function of a modem?
    ii. Why is it that two modems are usually needed for the transfer of data?

i. Answer: ____________________________________________________________
            ___________________________________________________________________

ii. Answer: ____________________________________________________________
            ___________________________________________________________________

(b) i. What is videoconferencing?
    ii. Name two important input and/or output devices which are typically used
        for videoconferencing.

i. Videoconferencing: _________________________________________________
            ___________________________________________________________________

ii. 1st device: _________________________________________________________
    2nd device: _________________________________________________________
(a) Distinguish between:
   i. compilers and interpreters
   ii. compilers/interpreters and assemblers

   i. Answer: 
   
   ii. Answer: 

(b) Programming languages are categorised into various generations. Which generation requires the least effort when creating programs?

   Language generation: 

(c) “Software portability is one of the key concepts of high-level programming.” Give two reasons to justify why software portability is very important nowadays.

   1st reason: 
   
   2nd reason: 

10 (a) Different data processing environments require different operating systems. Real-time, batch and time-sharing are three types of operating systems. For each type give an example where it is best used.

   Real-time: 
   
   Batch: 
   
   Time-sharing: 

(b) Two other types of operating systems are single-user and multi-user. Briefly explain the difference between them.

   Single-user: 
   
   Multi-user: 

The two instructions below form part of an Assembly language program:

- `LDA X ; Load accumulator A with X`
- `AND Y ; Logical AND the contents of accumulator A with Y`

i. Why does assembly code need translation?
ii. What would the value of the accumulator be after running the two instructions with \( X=12 \) and \( Y=9 \)?

i. **Answer:**

ii. **Accumulator=** ___________________________________________________________________

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**Section B – Answer BOTH Questions**

**12**

For each of the statements below write one or more instructions in Pascal.

(a) Ask the user to input a Real number \( X \) and output the integer part stored in variable \( Y \).
(b) Declare a constant $pi$ ($\pi$) equal to 3.143. Ask the user to enter the radius $r$ of a circle and store the area of the circle in variable $A$. Then output the area to 2 decimal places.

\[ \text{Area of circle} = \pi r^2. \text{ Use the built-in mathematical functions where necessary.} \]

(c) Ask the user to enter his/her age, if the age is less than 18 the message 'You cannot drive' is output. Use a While loop to terminate the execution until the age of 18 or more is given.

(d) Ask the user to enter his/her name and store it in variable name. Then the amount of characters of his/her name is output.
13  (a) Briefly describe what Systems Analysis is.

(b) A DVD lending shop asked you as a systems analyst to study his present manual system with a possibility to convert it to a computerised system.
   i. Write down in order the seven stages of Systems Analysis.
   ii. For each stage mention the main task involved in the computerisation of the DVD system.

   i. Stage 1:  
   Stage 2:  
   Stage 3:  
   Stage 4:  
   Stage 5:  
   Stage 6:  
   Stage 7:  

   ii. Stage 1:  
   Stage 2:  
   Stage 3:  
   Stage 4:  

   [1]
Stage 5:  


Stage 6:  


Stage 7:  


[14]