

FORM 5 (Option)

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:

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Paper Total	Course Work	Final Mark
Max	5	5	5	5	5	5	5	5	5	5	5	15	15	85%	15%	100%
Mark																

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: _____

[5]

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

[3]

(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

[2]

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

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

- Draw the **circuit** for this Boolean expression.
- Draw the **truth table** for this circuit.

Circuit:

Truth table:

[5]

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

i.	Generic software that includes a combination of text, audio, still images, animation and video:	
ii.	The process of altering/modifying a digital image on a computer:	
iii.	A small sized computer, often with an in-built diary application and few other functions such as an address book:	
iv.	Software used for the creation of a house plan:	
v.	The creation of documents, such as a flyer, using a page layout software on a computer:	

[5]

- 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: _____
- [3]
- (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:** _____
- _____
- [2]
- 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:** _____
- [2]
- (b) Give **three** important **principles** of the Data Protection Act.
- 1st Principle:** _____
- _____
- 2nd Principle:** _____
- _____
- 3rd Principle:** _____
- _____
- [3]
- 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:** _____
- [1]

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

Diagram:

Description: _____

[4]

- 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:** _____

[2]

- (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: _____

[3]

- 9 (a) Distinguish between:
- compilers and interpreters
 - compilers/interpreters and assemblers

i. **Answer:** _____

ii. **Answer:** _____

[2]

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

Language generation: _____

[1]

- (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: _____

[2]

- 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: _____

[3]

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

Single-user: _____

Multi-user: _____

[2]

- 11 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=** _____
Working Area:

[5]

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 .

[3]

- (b) Declare a constant ***pi*** (π) equal to 3.143. Ask the user to enter the radius ***r*** of circle and store the area of the circle in variable ***A***. Then output the area to 2 decimal places.
(Area of circle = πr^2 . Use the built-in mathematical functions where necessary.)

[4]

- (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.

[5]

- (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.

[3]

- 13 (a) Briefly describe what **Systems Analysis** is.

[1]

- (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.
- Write down in **order** the seven stages of Systems Analysis.
 - 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: _____

Stage 5: _____

Stage 6: _____

Stage 7: _____

[14]