Rewarding Learning

General Certificate of Secondary Education
2022

Digital Technology

Controlled Assessment Tasks

Unit 5: Digital Development Practice

[GDG51]

VALID FROM JUNE 2021

Research for all tasks can be completed under **limited** supervision.

All other elements of the tasks must be completed under **informal** supervision (medium level of control).

You have a total of **36 hours** to complete the tasks:

The total mark for this Unit 5 Controlled Assessment Task is **60**.

Candidates' work to be submitted May 2022

Controlled Assessment Tasks must comply with the Regulations as detailed in the Subject Specification.

NB: Some Controlled Assessment Tasks instructions may constitute more than 1 page.
Please check you have all the information you need to complete the task if printing from a computer.

Option B – Digital Development Practice:

Scenario: Clarendon High School Ski Trip

Clarendon High School is planning a ski trip to Chamonix, France, next April. The trip is being organised by Mr Walsh. This is the first time the school has planned such a trip. The trip will be open to pupils, from Year 8 to 14 and is suitable for all levels of skiing ability (beginner, intermediate and advanced).

Unit 5 Task

Mr Walsh requires a way to decide which group to assign each pupil to. This will be on the basis of data gathered during lessons at dry ski slopes and from a number of questions to assess pupils' awareness of ski safety e.g. appropriate clothing, necessary equipment, injury prevention.

Design and **build** a **programing solution** that will allow Mr Walsh to assign pupils to each ski group.

The program should include:

a) A staff logon screen;
b) A facility to add pupil details;
c) A set of quiz/test questions to measure the pupil's knowledge of the ski safety training;
d) A facility to enter 5 ski slope times for each pupil;
e) A display of the average time for each pupil;
f) A list of pupils in each group, given a group level;
g) Two further summary reports based on pupil data, for school management.

All documentation should be saved as one PDF and a working solution submitted.

Task Guidance

1 Design a solution using appropriate tools [13 marks]

- Use algorithms to design a fully decomposed solution to a given problem.
- Specify the data requirements for a proposed solution.
- Include suitable input, output and navigation design to enable a user to successfully use the system.
- Use validation and error trapping proposals in the design to improve the potential robustness of the system.

2 Building a solution [27 marks]

Use the appropriate features of an integrated development environment (IDE) to support the creation of a solution from a structured design:

- Code editor;
- Simple debugging tools;
- Compiler;
- Error diagnostics;
- Runtime environment; and
- Graphical User Interface, where appropriate.

Use the appropriate features of a programming language to build a solution from a structured design:

- Data Types:
  - numeric;
  - character;
  - string;
  - boolean; and
  - date/time.

- Control structures:
  - conditional execution: if;
  - conditional execution with alternative: if else, case; and
  - looping: for, while, repeat.

- Functions:
  - user defined functions;
  - inbuilt functions; and
  - mathematical functions.

- Data structures:
  - arrays; and
  - reading from and writing to text files.

- String handling:
  - using simple string handling functions.

- Basic arithmetic:
  - addition, subtraction, multiplication and division;
  - powers/exponentials; and
  - modulo arithmetic.

- Logical and Relational operators (and complex combinations thereof)
  - equal to / not equal to;
  - <, >, <=, >=; and
  - logical AND, OR and NOT.

3 Testing the solution [10 marks]

Create a test plan which:
- is presented in tabular format;
- incorporates black box and white box testing;
- utilises appropriate test data;
- shows expected output;
- identifies runtime and logic errors;
- reflects the general robustness of the system for use in evaluation; and
- measures the extent to which the user requirements have been met.

Test the solution using the test plan created and document the observed outcomes from each test.

4 Evaluate the solution [10 marks]

Evaluate the solution in terms of:
- user requirements;
- performance during testing;
- refinements required following testing; and
- robustness of the system.

All documentation should be saved as one PDF and a working solution submitted.

Total [60 marks]