

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
COMPUTING**

A453CA

Unit A453: Programming project

Specimen Controlled Assessment Material

INSTRUCTIONS TO TEACHERS

- Please refer to section 4 of the GCSE Computing specification for instructions on completing controlled assessment tasks.
- Each task can be contextualised appropriately to suit facilities available in your centre.
- The marking criteria should be available whilst completing the tasks
- The quality of written communication will be assessed in the testing section.
- The total number of marks for this unit is 45.

This scenario consists of three tasks.

Candidates should complete all tasks.

The tasks are set so as to enable all the techniques identified in the specification to be demonstrated in their solution. The tasks provide opportunities to demonstrate a range of skills and all three tasks contribute to the overall mark awarded for this assessment. Marks are awarded for using the appropriate skills and techniques effectively and efficiently to produce a solution to these three tasks. Not all techniques will be required for each of the subtasks. You are required to identify the requirements for each task, design a solution using appropriate techniques, code the solution and test/evaluate this solution against the identified design criteria.

Task 1 Scratch program.

15 marks

Design code and test a maze game in which a character is guided through a simple maze by the player pressing keys for left, right, up and down movements.

- The character should face in the direction of travel and should not be able to move outside the playing area, bouncing back if it touches the edge.
- If the character touches the walls of the maze then it should return to a predetermined start position.
- If the character is guided successfully around the maze to the finishing point then a message or other indication of success should be displayed.

Task 2 System password.

15 marks

Design, code test and evaluate a system to accept and test a password for certain characteristics.

- It should be at least 6, and no more than 12 characters long
- The system must indicate that the password has failed and why, asking the user to re enter their choice until a successful password is entered.
- A message to indicate that the password is acceptable must be displayed.
- Password strength can be assessed against simple criteria to assess its suitability; for example a password system using only upper and lower case alphabetical characters and numeric characters could assess the password strength as:
 - WEAK if only one type used, eg all lower case or all numeric
 - MEDIUM if two types are used
 - STRONG if all three types are used.

For example

hilltop, 123471324, HAHGFD are all WEAK,

catman3 and 123456t are MEDIUM and

RTH34gd is STRONG

- A message to indicate the password strength should be displayed after an acceptable password is chosen.

Task 3 High scores database.**15 marks**

Design, code and test a system to store and manage user names and their highest score.

The system must be able to

- create a file
- add data to a file
- locate data in the file by name and their highest score
- delete an item and its associated data from the file
- locate and update a high score for a user

The system need only cater for 10 items

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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

COMPUTING

A453CA

Unit A453: Programming project

Specimen Controlled Assessment Mark Scheme

The maximum mark for this unit is **45**.

The OCR set scenario will consist of up to three tasks to be solved by the candidate. The three tasks may be connected but you are only required to solve the problems set and do not need to resolve these into a single solution. The marking criteria refer to the overall solution of the tasks set in the scenario and for full marks to be available you must provide solutions to all of the tasks. The overall set of solutions will be considered against the marking criteria to identify the most appropriate range, and appropriate mark within that range, for each section.

Programming Techniques (0-18 marks available)

Each task is equally weighted

| Marks | | | |
|---|--|--|--|
| Marking Criteria | 1-2 | 3-4 | 5-6 |
| Use of programming techniques AO1 – 2 AO2 – 4 | There is an attempt to solve parts of the tasks using few of the techniques identified | There is an attempt at most parts of the tasks using several techniques. | There is an attempt to solve all of the tasks using most of the techniques listed. |
| Marking Criteria | 1-4 | 5-8 | 9-12 |
| Efficient use of programming techniques AO1 – 4 AO2 – 8 | The techniques used will produce partially working solutions to a small part of the problem. | The techniques will be used appropriately giving working solutions to most of the parts of the problem. Some sections of the solution will be inefficiently coded. | The techniques are used appropriately in all cases giving an efficient, working solution for all parts of the problem. |

0 = no response or responses not worthy of credit

Design (0-9 marks available)

Each task is equally weighted

| Marking Criteria | 1-3 | 4-6 | 7-9 |
|------------------------------|---|---|---|
| Design AO2 – 3 AO3 – 6 | There will be comments on what the task involves and a limited outline describing the intended approach to some parts of the problem. There will be brief comments on how this might be tested but with no mention of success criteria. | There will be a brief analysis of the tasks indicating what is required for each of the tasks, There will be a set of basic algorithms outlining a solution to most parts of the problem. There will be some discussion of how this will be tested and how this compares to the identified outcomes in the tasks. There will be discussion of the variables to be used and some general discussion of validation. | There will be a detailed analysis of what is required for these tasks justifying their approach to the solution. There will be a full set of detailed algorithms representing a solution to each part of the problem. There will be detailed discussion of testing and success criteria. The variables and structures will be identified together with any validation required. |

0 = no response or responses not worthy of credit

Development (0-9 marks available)

Each task is equally weighted

| Marking Criteria | 0-3 | 4-6 | 7-9 |
|-----------------------------------|--|--|---|
| Development AO2 – 5 AO3 – 4 | There will be some evidence to show a solution to part of the problem with some evidence to show that it works Code will be presented with little or no annotation, the variable names not reflecting their purpose and with little organisation or structure. | There will be evidence to show how the solutions were developed. There will be some evidence of testing during development showing that many parts of the solution work. The code will be organised with sensible variable names and with some annotation indicating what sections of the code does. | There will be detailed evidence showing development of the solution with evidence of systematic testing during development to show that all parts work as required. The code will be well organised with meaningful variable names and detailed annotation indicating the function of each section. |

0 = no response or responses not worthy of credit

Testing and evaluation (0-9 marks available)

Each task is equally weighted

| Marking Criteria | 0-3 | 4-6 | 7-9 |
|---|---|--|--|
| <p>Testing and evaluation</p> <p>AO2 – 4</p> <p>AO3 – 5</p> | <p>There will be evidence to show that the system has been tested for function but the test plan will be limited in scope with little structure. There will be limited evidence to show how the result matches the original criteria.</p> <p>The evidence of written communication is limited with little or no use of specialist terms.</p> <p>Errors in spelling, punctuation and grammar may be intrusive. Information may be ambiguous or disorganised.</p> | <p>There will be a test plan covering many parts of the problem with some suggested test data. There will be evidence that the system has been tested using this data. There will be some evidence to show how the results of testing have been compared to the original criteria. There will be a brief discussion of how successful or otherwise the solutions are.</p> <p>The quality of written communication is good using some specialist terms</p> <p>There will be few errors in spelling, grammar and punctuation.</p> <p>Information for the most part will be presented in a structured format.</p> | <p>The test plan will cover all major success criteria for the original problem with evidence to show how each of these criteria have been met, or if they have not been met, how the issue might be resolved. There will be a full evaluation of the final solution against the success criteria.</p> <p>A high level of written communication will be obvious throughout the task and specialist terms/technology with accurate use of spelling will have been used. Grammar and punctuation will be used correctly and information will be presented in a coherent and structured format.</p> |

0 = no response or responses not worthy of credit