Pearson BTEC Level 3 Nationals Extended Diploma

Window for supervised period:
Monday 25 April 2022 - Friday 29 April 2022

Supervised hours 6 hours

Paper reference	**31771H**

Computing
UNIT 4: Software Design and Development Project
Part S

You must have:
Testplan.rtf

Instructions

- This booklet contains material for the completion of the set task under supervised conditions.
- This booklet is specific to each series and this material must only be issued to learners who have been entered to undertake the task in the relevant series.
- This booklet should be kept securely until the start of the 6-hour supervised assessment period and between sessions.
- This set task should be undertaken during the assessment period of 1 week timetabled by Pearson.
- This booklet should not be returned to Pearson.
- Answer **all** activities.

Information

- The total mark for this paper is 68.

Turn over ▶

Pearson

Instructions to Teachers/Tutors and/or Invigilators

This paper must be read in conjunction with the unit information in the specification and the *BTEC Nationals Instructions for Conducting External Assessments (ICEA)* document. See the Pearson website for details.

Refer carefully to the instructions in this task booklet and the *BTEC Nationals Instructions for Conducting External Assessments (ICEA)* document to ensure that the assessment is supervised correctly.

The set task should be carried out under supervised conditions on a computer.

An electronic template for use in activities 3 and 4 will be provided for centres to download for candidate use.

The task must be completed using a C family language or Python 3.4 or later version.

Access to the offline help files contained within your chosen development environment is permitted.

Centres are free to arrange the supervised assessment period how they wish provided the six hours for producing final outcomes are under the level of control specified, and in accordance with the conduct procedures.

Teachers/tutors may clarify the wording that appears in this task but cannot provide any guidance in completion of the task.

Teachers/tutors and invigilators should note that they are responsible for maintaining security and for reporting issues to Pearson.

Maintaining Security

- Learners must not bring anything into the supervised environment or take anything out.

- Centres are responsible for putting in place appropriate checks to ensure that only permitted material is introduced into the supervised environment.

- Internet access is not permitted.

- Learner work must be regularly backed up. Learners should save their work to their folder using the naming instructions indicated in each activity.

- During any permitted break, and at the end of the session, materials must be kept securely and no items removed from the supervised environment.

- Learners can only access their work under supervision.

- User areas must only be accessible to the individual learners and to named members of staff.

- Any materials being used by learners must be collected in at the end of each session, stored securely and handed back at the beginning of the next session.

Outcomes for Submission

Each learner must create a folder to submit their work. Each folder should be named according to this naming convention:

[CentreNumber]_[Registration number]_[surname]_[first letter of first name]

Example: Joshua Smith with registration number F180542 at centre 12345 would have a folder titled

12345_ F180542_Smith_J

Each learner will need to submit 6 PDF documents and 1 .txt document, within their folder, using the file names listed.

Activity 1:
activity1flowchart_[Registration number]_[surname]_[first letter of first name] *as a PDF*.

Activity 2:
activity2pseudocode_[Registration number]_[surname]_[first letter of first name] *as a PDF*.

Activity 3:
activity3testplan_[Registration number]_[surname]_[first letter of first name] *as a PDF*.

Activity 4:
activity4code_[Registration number]_[surname]_[first letter of first name] *as a .txt file and as a PDF*.

activity4testing_[Registration number]_[surname]_[first letter of first name] *as a PDF.*

Activity 5:
activity5evaluation_[Registration number]_[surname]_[first letter of first name] *as a PDF*.

An authentication sheet must be completed by each learner and submitted with the final outcomes.

The work should be submitted no later than 4 May 2022.

Instructions for Learners

Read the set task information carefully.

This contains all the information you need to complete each activity within the set task.

Plan your time carefully to allow for the preparation and completion of all the activities.

Your centre will advise you of the timing for the supervised period. It is likely that you will be given more than one timetabled session to complete these tasks.

Internet access is not allowed.

You will complete this set task under supervision and your work will be kept securely at all times.

You must work independently throughout the supervised assessment period and should not share your work with other learners.

You may use a calculator and will have access to a computer. All activities should be completed using a computer.

Your teacher/tutor and/or invigilator may clarify the wording that appears in this task but cannot provide any guidance on completion of the task.

The task must be completed using a C family language or Python 3.4 or later version.

You will have access to the offline help files contained within your chosen development environment.

Outcomes for Submission

You must create a folder to submit your work. Your folder should be named according to this naming convention:

[CentreNumber]_[Registration number]_[surname]_[first letter of first name]

Example: Joshua Smith with registration number F180542 at centre 12345 would have a folder titled

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Activity 3:
activity3testplan_[Registration number]_[surname]_[first letter of first name] *as a PDF*.

Activity 4:
activity4code_[Registration number]_[surname]_[first letter of first name] *as a .txt file and as a PDF*.

activity4testing_[Registration number]_[surname]_[first letter of first name] *as a PDF*.

Activity 5:
activity5evaluation_[Registration number]_[surname]_[first letter of first name] *as a PDF*.

You must complete an authentication sheet before you hand your work into your teacher/tutor and/or invigilator.

Set Task Brief

You are asked to use your software design, development, testing and evaluation skills to produce a program that meets the client's requirements.

A data storage company has commissioned you as a Junior Software Developer to write a program to help its staff create secure passwords. The program will use a scoring system to provide a security rating for the password.

You need to create a program that will allow staff to enter this information:

• a password to be rated.

The program should then provide the user with details to show:

• whether or not the password is too short or too long
• the breakdown of the points scored for the password
• the total points score for the password
• a security rating for the password based on the total score.

You must design, implement and test your program. You must also justify and evaluate your decisions.

When you are designing and developing the solution ensure that:

• standard programming conventions have been followed
• it is efficient and robust
• it is user friendly
• the program is tested using normal, abnormal and extreme data
• there is output to show the scoring and rating of the password.

Information

You are provided with this information to use when designing and developing your program:
- minimum and maximum length of password
- characters allowed in password
- password scoring system
- password security ratings.

Minimum and maximum length of password

Minimum length = 8 characters
Maximum length = 15 characters

Characters allowed in a password:
- special characters chosen from ! % & * + =
- lower case letters
- upper case letters
- numeric characters.

Password scoring system

Positive scores	
Item	**Points added**
Lower case letter	5 per letter
Upper case letter	5 per letter
Numeric characters	10 per numeric character
Special characters	10 per special character
Password contains 10 or more characters	20
Negative scores	
Item	**Points deducted**
Lower case letters only	3 per character
Upper case letters only	3 per character
Numeric characters only	5 per character

Password security ratings

Rating	Score range
Very low	20 or less
Low	21 to 40
Medium	41 to 70
High	71 to 80
Very high	81 and above

Set Task

You must complete ALL activities within the set task.

Produce your documents using a computer.

Save your documents in your folder ready for submission using the formats and naming conventions indicated.

Activity 1

Produce a flowchart, using British Computing Society symbols, to plan the logic and processes for the program.

Save your flowchart as a PDF in your folder for submission as
activity1flowchart_[Registration number]_[surname]_[first letter of first name]

You are advised to spend 1 hour and 10 minutes on this activity.

(Total for Activity 1 = 10 marks)

Activity 2

Produce pseudocode that a software developer could use to create the program.

Save your pseudocode as a PDF in your folder for submission as
activity2pseudocode_[Registration number]_[surname]_[first letter of first name]

You are advised to spend 1 hour and 10 minutes on this activity.

(Total for Activity 2 = 10 marks)

Activity 3

Use the document **testplan.rtf** to plan the testing of your complete program.

You should complete these columns:

- Test number
- Purpose of test
- Test data
- Expected result.

You will need to save this file so that you can complete the testing in activity 4.

Save your test plan as a PDF in your folder for submission as
activity3testplan_[Registration number]_[surname]_[first letter of first name]

You are advised to spend 35 minutes on this activity.

(Total for Activity 3 = 6 marks)

Activity 4

Use your flowchart, pseudocode and test plan to help write and test your program.

You should:

- write a program that meets the scenario requirements
- use a C family language or Python 3.4 or later version
- test your solution throughout the development process to ensure that it functions as expected
- record the outcomes of your testing and any actions taken in your test plan document.

Your evidence should include:

- a copy of your code containing annotations/comments
- a copy of your fully completed test plan document.

Save your code as a PDF and as a .txt file in your folder for submission as **activity4code_[Registration number]_[surname]_[first letter of first name]**

Save your testing document as a PDF in your folder for submission as **activity4testing_[Registration number]_[surname]_[first letter of first name]**

You are advised to spend 2 hours and 20 minutes on this activity.

(Total for Activity 4 = 30 marks)

Activity 5

Evaluate your program solution.

You should cover:

- how well your solution meets the requirements of the scenario
- the quality and performance of your program
- the choices you made about coding conventions
- the changes you made during the development process.

Save your evaluation as a PDF in your folder for submission as **activity5evaluation_[Registration number]_[surname]_[first letter of first name]**

You are advised to spend 45 minutes on this activity.

(Total for Activity 5 = 12 marks)

TOTAL FOR TASK = 68 MARKS