COMPUTER SCIENCE **2210/23**

Paper 2 Problem-solving and Programming **October/November 2019**
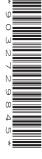
PRE-RELEASE MATERIAL

No Additional Materials are required.

This material should be given to the relevant teachers and candidates as soon as it has been received at the centre.

READ THESE INSTRUCTIONS FIRST

Candidates should use this material in preparation for the examination. Candidates should attempt the practical programming tasks using their chosen high-level, procedural programming language.

Any businesses described in this paper are entirely fictitious.

Cambridge Assessment
International Education

[Turn over

In preparation for the examination candidates should attempt the following practical tasks by **writing and testing a program or programs**.

You have been asked to write a program to calculate the area of a wall and the cost of the tiles needed to cover it. The program should work for any room with up to four walls being tiled. Tiles are sold in boxes; each box covers one square metre.

Tile description	Price per box
Small black granite	$19.50
Small grey marble	$25.95
Small powder blue	$35.75
Medium sunset yellow	$12.50
Medium berry red	$11.00
Medium glitter purple	$52.95
Large oak wood effect	$65.00
Large black granite	$58.98
Large bamboo effect	$85.00
Extra-large white marble	$62.75

Write and test a program or programs to calculate the area of the walls and the cost of tiles needed to tile a room.

- Your program or programs must include appropriate prompts for the entry of data; data must be validated on entry.
- Error messages and other output need to be set out clearly and understandably.
- All arrays, variables, constants and other identifiers must have meaningful names.

You will need to complete these **three** tasks. Each task must be fully tested.

Task 1 – Setting up and using the system for a single wall.
Set up your program to:
- Store the tile description, price per box and an identification code using a suitable programming technique.
- Display the list of tiles including the identification code, description and price per box.
- Prompt the user to input the height and width of the wall, and the identification code of the tiles they would like.
- Calculate and display the area of the wall, the number of boxes of tiles required (tiles are sold in boxes of complete square metres) and the total cost of the tiles.

Task 2 – Adding additional walls.
Extend your program to:
- Enter the number of walls to be tiled and the identification code of the tiles to be used. Only one identification code to be used for all walls.
- Enter the dimensions for each wall to be tiled.
- Calculate and display the total area of all walls, the number of boxes of tiles required (tiles are sold in boxes of complete square metres) and the total cost of the tiles.

Task 3 – Allowing for waste.
It is likely that some of the tiles will not be useable so it is sensible to allow a percentage for wastage, for example 10%. Alter your program to allow the user to input a percentage to calculate wastage and add this to the total area to be tiled. Calculate and display the revised number of boxes of tiles to be purchased (tiles are sold in boxes of complete square metres) and the total cost of the tiles.