

2 A program to calculate the pay of employees working for a company is being designed.

(a) Stepwise refinement has been used in the design of the program.

Describe stepwise refinement.

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..... [2]

(b) One of the program modules used to calculate employees' weekly bonus pay has been completed. The amount of bonus pay they receive is based on the number of hours worked and the value of sales made as shown in the table.

Bonus pay and value of sales are both in dollars.

Hours worked	Value of sales	Bonus pay
between 1 and 40 inclusive	2000 or less	0
between 1 and 40 inclusive	above 2000	50
above 40	2000 or less	10
above 40	above 2000	100

(i) The module is tested using white-box testing.

State **two** tests, using valid data, that can be used to test different paths through the program.

Test one:

Hours worked .....

Value of sales .....

Bonus pay .....

Test two:

Hours worked .....

Value of sales .....

Bonus pay .....

[2]

(ii) The program to calculate pay uses a number of modules which are each called from different places in the program.

The program is to be tested using stub testing before all the program modules have been completed.

Describe stub testing.

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..... [2]

(iii) The program has been completed and compiles successfully.

The program is tested using black-box testing.

Identify and describe **one** type of error that black-box testing could detect.

Type of error .....

Description .....

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[2]