# QUESTION 1.

**5** **(a)** A program calculates the exam grade awarded from a mark input by the u... written as a function `CalculateGrade`.

The function:

- has a single parameter `Mark` of `INTEGER` data type
- returns the grade awarded `Grade` of `STRING` data type

The logic for calculating the grade is as follows:

| Mark | Grade |
|---|---|
| Under 40 | FAIL |
| 40 and over and under 55 | PASS |
| 55 and over and under 70 | MERIT |
| 70 and over | DISTINCTION |

The programmer designs the following table for test data:

| Mark | Description | Expected result (Grade) |
|---|---|---|
| | Normal | |
| | Abnormal | |
| | Extreme/Boundary | |

**(i)** Complete the table above. [3]

**(ii)** State why this table design is suitable for black box testing.

.........................................................................................................................................

.....................................................................................................................[1]

**(b)** When designing and writing program code, explain what is meant by:

- an exception
- exception handling

...................................................................................................................................................

...................................................................................................................................................

...................................................................................................................................................

...................................................................................................................................................

...................................................................................................................................................

...............................................................................................................................................[3]

**(c)** A program is to be written to read a list of exam marks from an existing text file into a 1D array.

Each line of the file stores the mark for one student.

State **three** exceptions that a programmer should anticipate for this program.

1 ...............................................................................................................................................

...................................................................................................................................................

2 ...............................................................................................................................................

...................................................................................................................................................

3 ...............................................................................................................................................

...............................................................................................................................................[3]

**(d)** The following pseudocode is to read two numbers:

```
01  DECLARE Num1   : INTEGER
02  DECLARE Num2   : INTEGER
03  DECLARE Answer : INTEGER
04  TRY
05     OUTPUT "First number..."
06     INPUT Num1
07     OUTPUT "Second number..."
08     INPUT Num2
09     Answer ← Num1 / (Num2 – 6)
10     OUTPUT Answer
11  EXCEPT ThisException : EXCEPTION
12     OUTPUT ThisException.Message
13  FINALLY
14     // remainder of the program follows

…

29
30  ENDTRY
```

The programmer writes the corresponding program code.

A user inputs the number 53 followed by 6. The following output is produced:

```
First number...53
Second number...6
Arithmetic operation resulted in an overflow
```

**(i)** State the pseudocode line number which causes the exception to be raised.

.................................................. [1]

**(ii)** Explain the purpose of the pseudocode on lines `11` and `12`.

...........................................................................................................................................

...........................................................................................................................................

...........................................................................................................................................

...........................................................................................................................................

...........................................................................................................................................

.......................................................................................................................................[3]