Section B

You are advised to spend no more than **25 minutes** on this section.

Enter your answers to **Section B** in your Electronic Answer Document. You **must save** this document at regular intervals.

These questions refer to the **Preliminary Material** and the **Skeleton Program**, but do **not** require any additional programming.

Refer **either** to the **Preliminary Material** issued with this question paper **or** your electronic copy.

0 4 State the name of an identifier for:

0 4 . 1 a variable that is used to store a Boolean value.

[1 mark]

0 4 . 2 a user-defined subroutine that returns only **one** value that **must** be a string.

[1 mark]

0 4 . 3 a user-defined subroutine that uses nested **indefinite** iteration.

[1 mark]

0 5 The **Skeleton Program** uses a number of data structures.

0 5 . 1 State the identifier of the data structure that stores values of **more than one data type**.

[1 mark]

0 5 . 2 State the identifier of a data structure that stores values of **only one data type**.

[1 mark]

0 6 This question refers to the constants set at the beginning of the **Skeleton Program**.

It is a good programming technique to use a named constant rather than the value it represents.

State a reason why each of the following are set as constants. Your answers for Questions **06.1** and **06.2** must be different.

0 6 . 1 `EMPTY_STRING`

[1 mark]

0 6 . 2 `MAX_WIDTH`

[1 mark]

Turn over for the next question

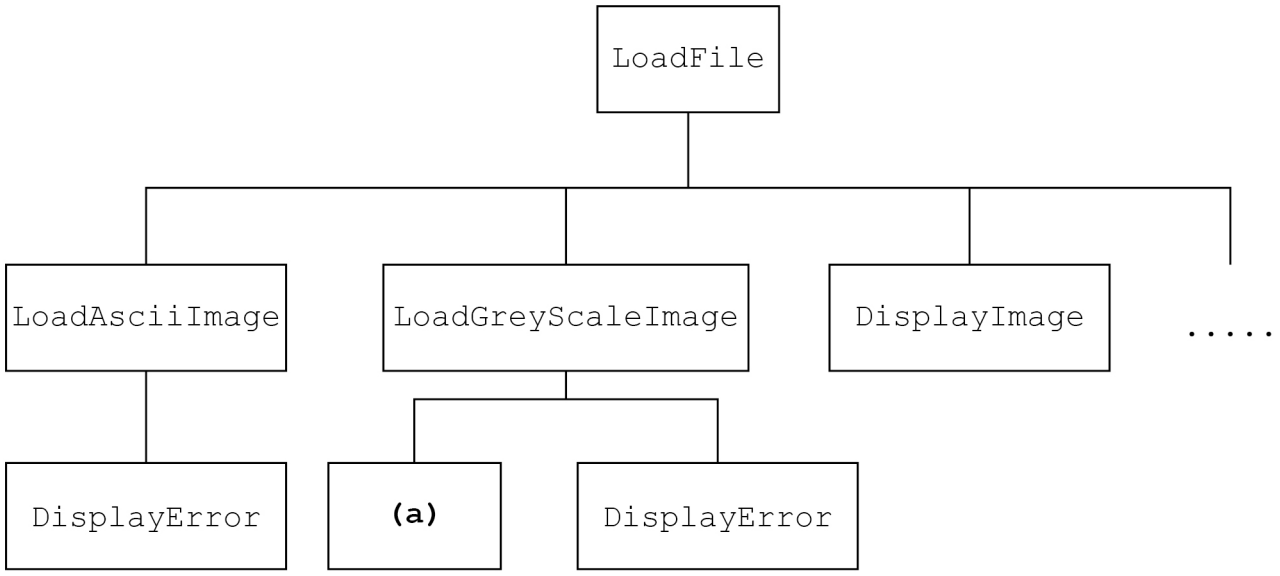
0 7 This question refers to the subroutine `LoadGreyScaleImage`

Describe **two** possible errors that could cause an exception in this subroutine.

[2 marks]

0 8 **Figure 3** shows an incomplete hierarchy chart for part of the **Skeleton Program**.

Figure 3



0 8 . 1 What is the purpose of a hierarchy chart?

[1 mark]

0 8 . 2 What does each box in a hierarchy chart represent?

[1 mark]

0 8 . 3 What should be written in box **(a)** in **Figure 3**?

[1 mark]

0 9 This question refers to the subroutines `Graphics` and `LoadFile`

0 9 . 1 State what values are passed in the parameter `Header` to the subroutine `LoadFile` when `LoadFile` is called for the **first** time in the subroutine `Graphics`

[1 mark]

0 9 . 2 Explain how the content of `HeaderLine` is processed after it has been assigned a value.

[3 marks]

1 0 This question refers to the subroutine `ConvertChar`

With reference to the fact that 0 represents the darkest greyscale (black) and 255 represents the lightest greyscale (white), explain the purpose of `ConvertChar`

[2 marks]

1 1 This question refers to the text file `image3.txt` and the subroutine `LoadAsciiImage`

The first line of the text file `image3.txt` contains:

```
Cat,59,25,A
```

1 1 . 1 Explain the effect of changing the first line to `Cat,25,59,A` and then calling `LoadAsciiImage`

[2 marks]

1 1 . 2 Explain the effect of changing the first line to `Cat,59,59,A` and then calling `LoadAsciiImage`

[2 marks]

1 1 . 3 Explain the effect of changing the first line to `Cat,59,10,A` and then calling `LoadAsciiImage`

[2 marks]

1 2 This question refers to the subroutine `DisplayImage`

Explain what effect swapping around the nested iteration structure in this subroutine would have on the image output, assuming that the image width and height are equal.

Written in pseudo-code the **altered** iteration structure would be:

```
FOR ThisColumn ← 0 TO Header.Width - 1
  FOR ThisRow ← 0 TO Header.Height - 1
    OUTPUT Grid[ThisRow, ThisColumn]
  ENDFOR
  OUTPUT newline
ENDFOR
```

[3 marks]

Turn over for the next section