11. A spelling game stores 20 words. Each word has an accompanying sound file where an actor's voice speaks the word.

When the game is running the program repeats the following 20 times:

- selects one of the 20 words
- loads a sound file matching the selected word
- plays the sound file through a speaker
- asks the user to type in the word
- compares the user's entry to the stored word
- informs the user if they have spelled the word correctly.

When the game is over the program displays the total number of words that have been spelled correctly by the user.

(a) Complete the table below by identifying three processes from the above description of the game. **3**

Input(s)	User enters the word
Process(es)	
Output(s)	Play matching sound file through speaker. Display whether or not the user spelled the word correctly. Display the total number of correctly spelled words.

11. (continued)

(b) The spelling game stores 20 words.

(i) State the data structure and data type that will be required to store the 20 words. **2**

Data structure _____

Data type _____

(ii) State where in the computer system the 20 words will be stored while the program is running. **1**

_____

(iii) State the part of the processor that will compare the selected stored word with the user's input. **1**

_____

[Turn over

11. (continued)

(c) Part of the program code is shown below.

```
...
Line 27  REPEAT 20 TIMES
Line 28    SET choice TO <a number between 0 to 19>
Line 29    <load selected sound file>
Line 30    SEND <sound file> TO <speaker>
Line 31    RECEIVE usersWord FROM KEYBOARD
Line 32    IF usersWord = NOT(storedWords[choice]) THEN
Line 33      SEND "Sorry, the correct spelling is " &
             storedWords[choice] TO DISPLAY
Line 34    ELSE
Line 35      SEND "Well Done" TO DISPLAY
Line 36      SET correctGuesses TO correctGuesses + 1
Line 37    END IF
Line 38  END REPEAT
Line 39  SEND "You guessed " & correctGuesses & " words
         correctly" TO DISPLAY
```

(i) Identify the logical operator used in the above code. **1**

(ii) Using a programming language of your choice, re-write Line 28 to show how the value stored in the variable choice would be generated. Your answer should use a function. **2**

(iii) When the above code was tested several times, it was found that the user was not asked to spell all 20 of the stored words.

Explain why the program did not ask the user to spell every stored word. **1**

11. (continued)

(d) The first stored word is

Animal

State the number of bits required to store this word using extended ASCII. **1**