Revision Questions 2

1. A program allows a user to enter a capital letter from “A” to “F” when making a choice from a menu program.

```
Line 1      RECEIVE choice FROM (STRING) KEYBOARD
Line 2      WHILE _____________________________________
Line 3          SEND “ERROR: Re-enter A to F” TO DISPLAY
Line 4          RECEIVE choice FROM (STRING) KEYBOARD
Line 5      END WHILE
```

   a) Complete line 2 of the above pseudocode (3).
   b) State the type of loop shown in the above pseudocode. (1)

2. The code below monitors the weight of items in a lift.

```
Line 5      RECEIVE weight FROM <sensor>
Line 6      WHILE weight <=100 DO
Line 7      RECEIVE weight FROM <sensor>
Line 8      END WHILE
LINE 9      SEND signal TO <alert system>
```

   a) Describe what happens in lines 6 to 9 if the sensor detects a value of 103.5 at line 5. (3)
   b) State the data type of the variable weight. (1)

3. The following section of code calculates the average rainfall over a week.

```
Line 15 RECEIVE rain_day1 FROM KEYBOARD
Line 16 RECEIVE rain_day2 FROM KEYBOARD
Line 17 RECEIVE rain_day3 FROM KEYBOARD
Line 18 RECEIVE rain_day4 FROM KEYBOARD
Line 19 RECEIVE rain_day5 FROM KEYBOARD
Line 20 RECEIVE rain_day6 FROM KEYBOARD
Line 21 RECEIVE rain_day7 FROM KEYBOARD
Line 22 SET average_Rainfall TO (rain_day1 + rain_day2 +
rain_day3 + rain_day4 + rain_day5 + rain_day6 + rain_day7)/7
Line 23 <display the average rainfall>
```

Using a programming language of your choice, rewrite lines 15 to 22 of code using more efficient constructs. (5)

4. Jim is creating an application to calculate the ticket cost based on a person's age.

Age (years)	Ticket Price (£)
1 – 5	2
6 – 60	6
61 upwards	3

Analyse the problem and identify the input, process and the output for the above specification. (3)

5. A program has been written to attempt to break a 4 digit number code to gain access to some files.

```
Line 1      SET code TO “0000”
Line 2      SET cracked TO FALSE
Line 3      REPEAT
Line 4          <attempt to use code, if successful set cracked to
                TRUE>
Line 5          SET code_value TO INTEGER(code) + 1
Line 6          SET code TO STR (code_value)
Line 7      UNTIL_____________________________________________
```

Complete line 7 of the code so that the loop is terminated if the cracked code is used successfully or if all the possible values have been used. (3)

6. Below is pseudocode for a program:

```
Line 24 SET found to FALSE
Line 25 SET location TO 0
Line 26 REPEAT
Line 27     IF haystack[location] = needle THEN
Line 28         SET found = TRUE
Line 29     END IF
Line 30     SET location TO location + 1
Line 31 UNTIL found = TRUE OR location = 10
```

a) State the data type of the variable “found”. (1)

b) State two programming constructs used in the code above. (2)

7. Read the following design for a solution to a problem.

Algorithm

1 Ask user to enter their name

2 Ask user to enter their address details

3 Generate user login ID

4 Display user login ID

Refinements

1.1 Ask user to enter their surname only

2.1 Ask user to enter the house number of their address

2.2 Ask user to enter the first 4 characters of their postcode

3.1 Store the user login ID as: surname + house number + post code

a) Pseudocode is the design technique used above. State the name of another design technique that could have been used. (1)

b) State the output expected if the design is tested by Simon Green who lives at 10 Ayr Road, KA19 3UP. (3)

c) Using a design technique of your choice, add input validation to refinement 2.2 to ensure the user only enters a 4 character string. An error message should inform the user when their input is not valid. (4)