2014

12. This pseudocode allows a user to enter the level they wish to start playing a game.

```
Line 1  RECEIVE level FROM (INTEGER) KEYBOARD
Line 2  WHILE level < 1 OR level > 10 DO
Line 3              SEND "error : please re-enter level" TO DISPLAY
Line 4              RECEIVE level FROM (INTEGER) KEYBOARD
Line 5  END WHILE
```

Explain what happens if a user enters 12. 2

_____

_____

14. Employees can only access their company network if they enter a correct username and password. A validation program is being developed and will run each time an employee logs on.

An extract of pseudocode from the program is shown below.

```
Line 1  RECEIVE userName FROM (STRING) KEYBOARD
Line 2  RECEIVE pinNumber FROM (STRING) KEYBOARD
Line 3  IF userName VALID OR pinNumber VALID THEN
Line 4          Allow access to network
Line 5  ELSE
Line 6          SEND "Access Denied" TO SCREEN
Line 7  END IF
```

An error is noticed when the program is tested.

(a) Identify the line containing a logic error. 1

Line _____

(b) State how this error should be corrected. 1

_____

_____

18. An athlete is developing a mobile application (app).

The app will allow athletes to track weight in Kg.

Part of the pseudocode for this app is shown below.

```
.....
.....
Line 15   SEND "Enter your new weight" TO DISPLAY
Line 16   RECEIVE newWeight FROM (REAL) KEYBOARD
Line 17       IF newWeight > previousWeight [counter] THEN
Line 18               SEND ["You have gained weight"] TO DISPLAY
Line 19       END IF
Line 20   SET previousWeight [counter] TO newWeight
....
.....
```

(a) (i) Identify the line that includes a condition. **1**

Line _____

(ii) Identify the line that stores a value in an array. **1**

Line _____

(iii) Identify the line that accepts input values into the program. **1**

Line _____

(b) When the code for the program is written the programmer mis-types the word UNTIL, typing UNTOL instead.

State the type of programming error being described above. **1**

_____

18. (continued)

(c) The pseudocode is edited to ensure that the new weight being entered is acceptable.

```
....
Line 16   REPEAT
Line 17             RECEIVE newWeight FROM (REAL) KEYBOARD
Line 18   UNTIL newWeight > 20 AND newWeight < 70
.....
```

(i) State the **type** of loop shown above. **1**

_____

(ii) State an input **the user** could enter to enable the program to continue from line 18. **1**

_____

20. A programming language provides the following pre-defined functions.

move(n) n = distance moved in pixels

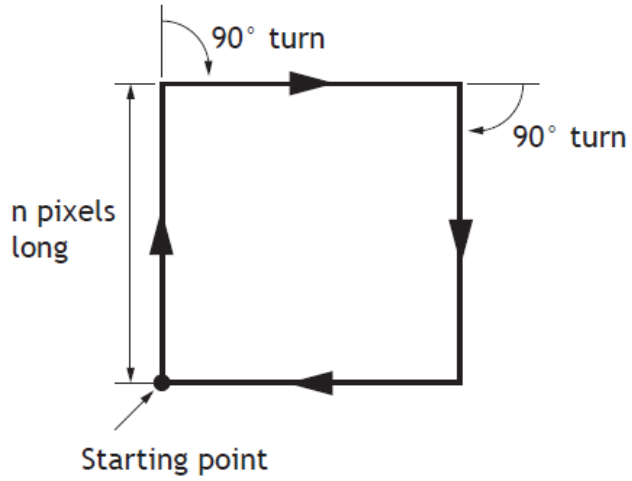
rotate(d) d = degrees turned (positive means clockwise)

These can be used by the programmer to draw lines.

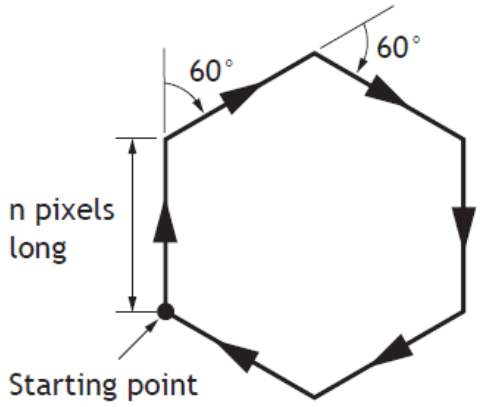
A programmer writes the code to draw a square. The code is shown below.

```
Square(n)

    REPEAT 4 TIMES
    move(n)
    rotate(90)
    END REPEAT
```



(a) Write the code that would draw a hexagon. 3

Hexagon(n)	

(b) Describe one way you could make the programmer's code more readable. 1

(c) Suggest a new pre-defined function that could be added to this programming language. 1

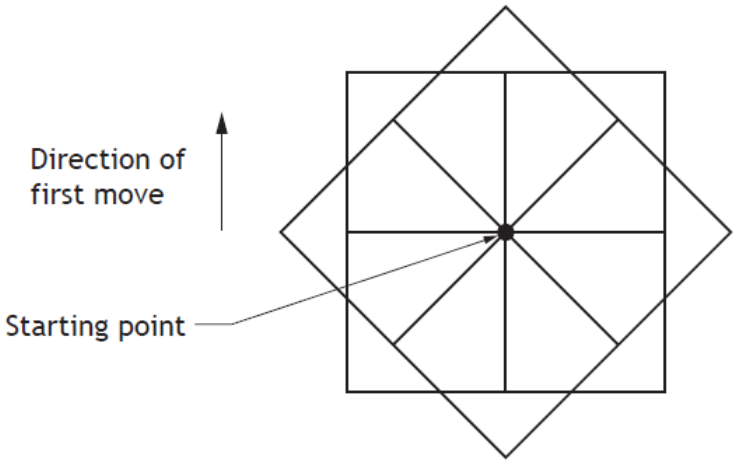
20. (continued)

(d) The following program uses the Square(n) function to draw a pattern.

Two values have been missed out from the code.

Complete the code by filling in the values in the two boxes. 2

```
REPEAT [ ] TIMES
square(n)
rotate( [ ] )
END REPEAT
```



(e) The shapes that are drawn by the program can be saved as vector graphics.

Describe how a square would be saved as a vector graphic. 2

_____

_____

2015

5. This pseudocode allows the user to guess the age of a teddy bear to win it in a competition.

```
Line 1    RECEIVE guess FROM (INTEGER) KEYBOARD
Line 2    WHILE guess < 1 OR guess > 80 DO
Line 3        SEND "invalid guess: please try again" TO DISPLAY
Line 4        RECEIVE guess FROM (INTEGER) KEYBOARD
Line 5    END WHILE
```

Complete the table below to show normal and exceptional test data for guess. **2**

7. Explain the purpose of lines 5 to 8 in this pseudocode. **2**

```
...
Line 4    SET password TO "h1gh@sch00l"
Line 5    REPEAT
Line 6        SEND "Please enter your password" TO DISPLAY
Line 7        RECEIVE user_guess  FROM (INTEGER) KEYBOARD
Line 8    UNTIL password = user_guess
```

10. State the **data type** of the variable "password" in the code below. **1**

```
...
Line 12   SEND "Please enter your password" TO DISPLAY
Line 13   IF (password < > "h1gh@sch00l") THEN
Line 14       SEND "error: please re-enter password" TO DISPLAY
Line 15   END IF
```

19. A program is written to calculate the cost of feeding chickens for one month. Chickens eat 5 Kilograms of grain each month. An incomplete design for the program is shown below.

```
Line 1    SEND "Enter the number of chickens and the cost of grain" TO
          DISPLAY
Line 2    RECEIVE numberOfChickens FROM (_____)
          KEYBOARD
Line 3    RECEIVE pricePerKilo FROM (_____) KEYBOARD
Line 4    SEND "Is the grain full price?" TO DISPLAY
Line 5    RECEIVE fullPrice FROM (_____) KEYBOARD
Line 6    IF fullPrice = True THEN
Line 7        SET totalPrice TO numberOfChickens *5*pricePerKilo
Line 8    END IF
Line 9    IF fullPrice = False THEN
Line 10   SET totalPrice TO numberOfChickens *5*(pricePerKilo*0.8)
Line 11   END IF
Line 12   SEND ["The total cost of grain required for" & numberOfChickens
          & "chickens is £" & totalPrice] TO DISPLAY
```

(a) The above design should show the type of data being entered by keyboard in Lines 2, 3 and 5. State the most appropriate data types for the following variables. 3

numberOfChickens _____

pricePerKilo _____

fullPrice _____

Question 19 (continued)

(b) (i) State the lines of pseudocode that contain conditional statements. **2**

_____

_____

(ii) State the part of the processor that compares the values in a conditional statement. **1**

_____

(c) The program is later improved to store the totalPrice for each month of a year.

(i) State the data structure that would be required to store the list of totalPrice values. **2**

_____

_____

(ii) State the **type** of loop required to repeat the code in lines 1 to 12 for each month of the year. Explain why this type of loop would be used. **2**

Type of Loop _____

Explanation _____

2016