0478

COMPUTER SCIENCE

TOPIC QUESTION PAPER-2 SET- 12

SMART EXAM RESOURCES

Unit 7 Algorithm Design and Problem Solving

1. The algorithm allows a number to be entered. It then calculates and outputs the next number in the mathematical series.

```
Fib ← 1
Prev2 ← 0
Prev1 ← 1
INPUT Number
IF Number = 0
    THEN Fib ← 0
ENDIF
WHILE Number > 2
    Fib ← Prev2 + Prev1
    Prev2 ← Prev1
    Prev1 ← Fib
    Number ← Number - 1
ENDWHILE
OUTPUT Fib
```

(a) Complete the trace table for the input data: **7**

Fib	Prev2	Prev1	Number	OUTPUT

[4]

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(b) Complete the trace table for the input data: **2**

Fib	Prev2	Prev1	Number	OUTPUT

[2]

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2. Read this section of code that inputs the ages of people entering an event. The input sequence is ended by inputting a negative value for age. The code outputs the number of people at the event over the age of 18.

```
01    Num18 = 0
02    INPUT Age
03    WHILE Age >= 0 DO
04        IF Age >= 18 THEN
05            Num18 = Num18 + Age
06        ENDIF
07    ENDWHILE
08    PRINT Num18 - Age
```

There are four errors in this code.

Locate these errors and suggest code correction to remove each error.

Error 1.....

Correction.....

.....

Error .....

Correction.....

.....

Error .....

Correction.....

.....

Error 4.....

Correction.....

.....[4]

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3. There is a program that stores the following data:

- EmployeeID, an employee ID which must be two letters followed by 4 numbers, e.g. TY4587
- Manager, whether the employee is a manager or not
- AnnualHoliday, number of whole days' annual holiday
- PayGrade, the employee's pay grade which must be a single letter A–F

Complete the following table to identify:

- The most appropriate data type for each variable
- An appropriate validation check for each variable. You must use a different validation check for each variable.

Variable	**Data type**	**Appropriate validation check**
EmployeeID		
Manager		
AnnualHoliday		
PayGrade		

[8]

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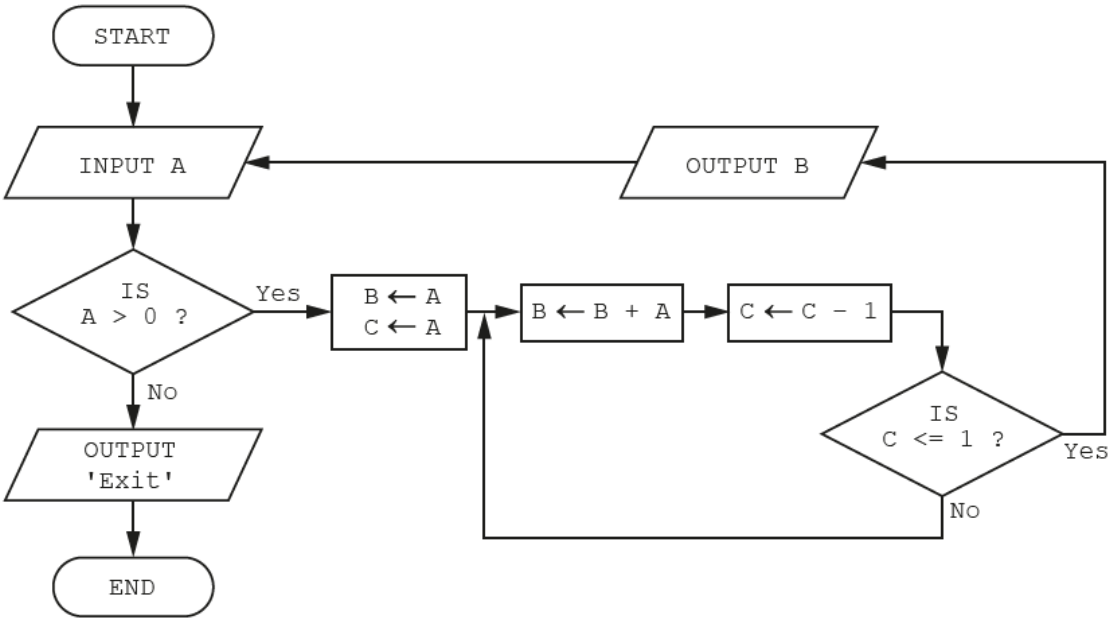
4. Study the flowchart.



Complete the trace table for the input values 4, 3, −1:

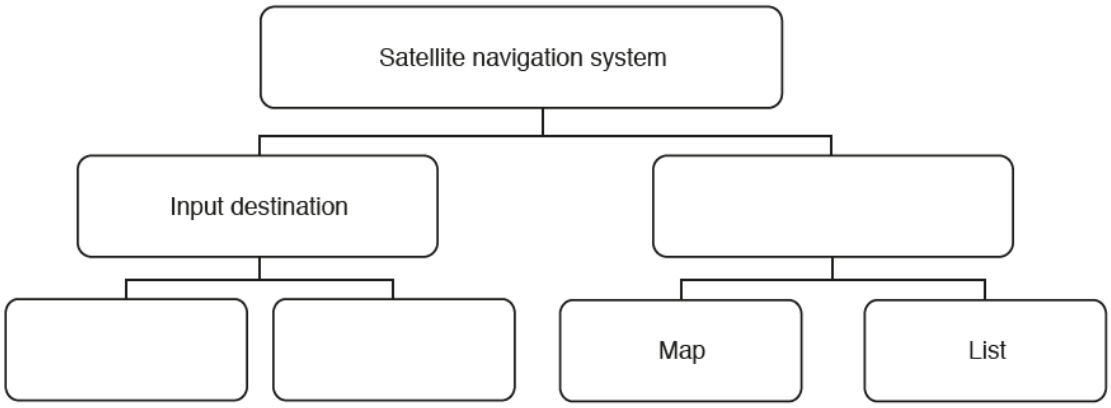
A	B	C	OUTPUT

[4]

5. A satellite navigation system works using destination details entered by the user, either a new destination or chosen from previously saved destinations. The satellite navigation system will then output directions to the destination in the form of either a visual map or a list of directions.

A satellite navigation system is an example of a computer system that is made up of sub-systems. This structure diagram shows some of its sub-systems.

Complete the diagram by filling in the empty boxes.



[2]

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6. This section of program code asks for 50 numbers to be entered. The total and average of the numbers are calculated.

```
1   Total = 0
2   Counter = 50
3   PRINT 'When prompted, enter 50 numbers, one at a time'
4   REPEAT
5     PRINT 'Enter a number'
6     INPUT Number
7     Total + Number = Total
8     Number = Number + 1
9   UNTIL Counter = 50
10  Average = Number * Counter
11  PRINT 'The average of the numbers you entered is ', Average
```

There are **four** errors in this code.

State the line number for each error and write the correct code for

that line. Error 1 Line number .....

Correct code
.....

Error 2 Line number .....

Correct code
.....

Error 3 Line number .....

Correct code
.....

Error 4 Line number .....

Correct code
.....[4]

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