

0478

COMPUTER SCIENCE

TOPIC QUESTION PAPER-2 SET- 10

SMART EXAM RESOURCES

Unit 7 Algorithm Design and Problem Solving

1.(a) Draw a flowchart for an algorithm to input numbers. Reject any numbers that are negative and count how many numbers are positive. When the number zero is input, the process ends and the count of positive numbers is output. [6]

(b) Explain the changes you will make to your algorithm to also count the negative numbers.

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.....[2]

2. This pseudocode algorithm inputs two non-zero numbers and a sign, and then performs the calculation shown by the sign. An input of zero for the first number terminates the process.

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INPUT Number1, Number2, Sign
WHILE Number1 <> 0
    IF Sign = '+' THEN Answer ← Number1 + Number2 ENDIF
    IF Sign = '-' THEN Answer ← Number1 - Number2 ENDIF
    IF Sign = '*' THEN Answer ← Number1 * Number2 ENDIF
    IF Sign = '/' THEN Answer ← Number1 / Number2 ENDIF
    IF Sign <> '/' AND Sign <> '*' AND Sign <> '-' AND Sign <> '+'
        THEN Answer ← 0
    ENDIF
    IF Answer <> 0 THEN OUTPUT Answer ENDIF
    INPUT Number1, Number2, Sign
ENDWHILE

```

(a) Complete the trace table for the input data: 5, 7, +, 6, 2, −, 4, 3, *, 7, 8, ?, 0, 0, /

[illegible]

[3]

(b) Show how you could improve the algorithm written in pseudocode by writing an alternative type of conditional statement in pseudocode.

.....[3]

3. A programmer has written a routine to store the name, email address and password of a contributor to a website's discussion group.

(a) The programmer has chosen to verify the name, email address and password.

Explain why verification was chosen and describe how the programmer would verify this data.

[4]

(b) The programmer has also decided to validate the email address and the password.

Describe validation checks that could be used.

Email address.....

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Password

[2]

4. A program checks that the weight of a basket of fruit is over 1.00 kilograms and under 1.10 kilograms. Weights are recorded to an accuracy of two decimal places and any weight not in this form has already been rejected.

Give **three** weights as test data and for each weight state a reason for choosing it. All your reasons must be different.

Weight 1

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Reason.....

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Weight 2

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Reason.....

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Weight 3

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Reason.....

.....[3]

5. Describe, using an example, the purpose of the following checks during data entry.

(a) Validation check

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.....[2]

(b) Verification check

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.....[2]

6. An algorithm is written in pseudocode:

```

INPUT Number
IF Number > 100
    THEN OUTPUT "The number is too large"
    ELSE OUTPUT "The number is acceptable"
ENDIF

```

(a) Describe the purpose of the algorithm.

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.....[2]

(b) (i) The algorithm only allows one attempt at inputting an acceptable value. State how you would change the algorithm so that it continues until a suitable input is supplied.

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.....[1]

(ii) Re-write the algorithm in full, using pseudocode, to implement your answer to **part (b)(i)**.

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.....[3]