

CAMBRIDGE INTERNATIONAL EXAMINATIONS**Cambridge International Advanced Subsidiary and Advanced Level****MARK SCHEME for the October/November 2015 series****9608 COMPUTER SCIENCE****9608/22**

Paper 2 (Written Paper), maximum raw mark 75

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- 1 (i) 2 [1]
- (ii) 7.5 [1]
Accept: 7 ½
- (iii) FALSE [1]
- (iv) TRUE [1]
- (v) ERROR [1]

2 (a)

	Inputs		Output
Test Case	P	Q	X
1	1	1	1
2	1	0	0
3	0	1	0
4	0	0	0

[1]

[1]

[1]

[1]

(b)

```
IF P = 1 AND Q = 1
  THEN
    X ← 1
  ELSE
    X ← 0
ENDIF
```

```
IF P = 0 OR Q = 0
  THEN
    X ← 0
  ELSE
    X ← 1
ENDIF
```

Mark as follows:

Structure: IF – THEN – ELSE – ENDIF

[1]

Condition: P = 1 AND Q = 1

[1]

Allow &/&& for the operator

Logic: X ← 1 (for TRUE) }
 X ← 0 (for FALSE) }

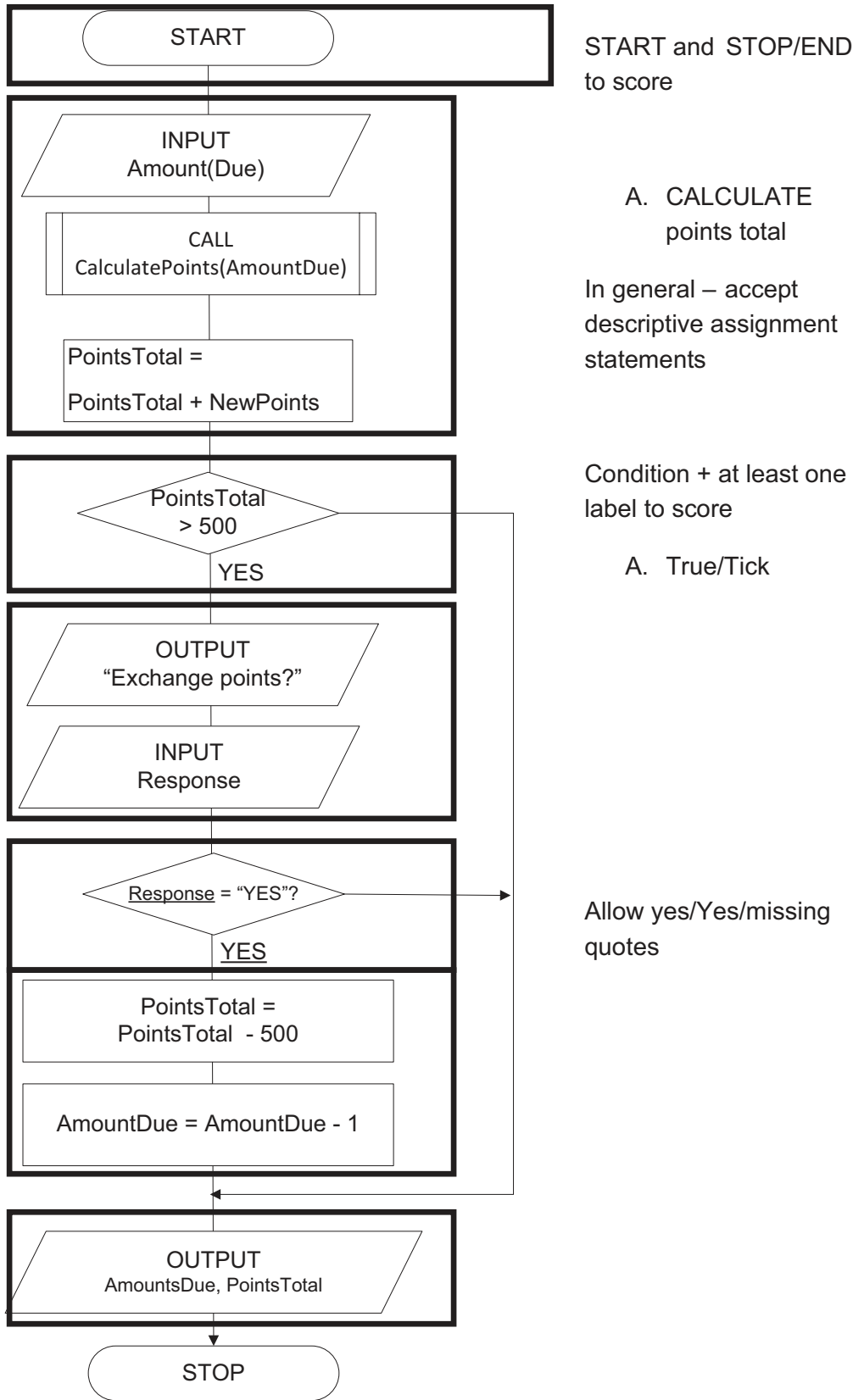
[1]

Check carefully for:

- other alternative correct algorithm
- a ‘mirror copy’ of the question paper algorithm – score 0

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[Max 6]

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- 4 (a) The combination of suit and card number // the 'pair' of numbers // the pair of random numbers [1]
There will be duplicates/repeats//not all cards will be drawn [1]
- (b) (i) 32 // 33 [1]
(ii) 27 // 28 [1]
(iii) 08 [1]
(iv) 12 // 13 [1]
- (c) 1 [1]
- (d) DealCount <> 52 // NewCard = FALSE
Allow: Inclusion of the WHILE [1]
- (e) Test has the card has already been drawn? [1]
Set value TRUE for this card entry (in the array)/this card [1]
Flags that this is the first time this card has been drawn // decides if another card must be generated [1]
Outputs the new card value [1]
- [Max 2]
- (f) CardPack ARRAY[1:4 , 1:13] OF/:/AS BOOLEAN [1]
Allow: parentheses
- (g) **Pseudocode ...**
(SELECT) CASE (OF) CardValue + ENDCASE [1]
(CASE) 1: CardName ← "Ace" 1 mark for any one correct [1]
(CASE) 11: CardName ← "Jack"
(CASE) 12: CardName ← "Queen"
(CASE) 13: CardName ← "King" (final three cases ...) [1]
OTHERWISE (/ELSE) CardName ← CardValue //
(CASE) 2 TO 10: CardName ← CardValue [1]
ENDCASE // ENDSELECT

Note: Must be double quotes present and correct case

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Visual Basic

```
Select Case CardValue
    Case 1
        CardName = "Ace"
    Case 11
        CardName = "Jack"
    Case 12
        CardName = "Queen"
    Case 13
        CardName = "King"
    Case Else // Case 2 to 10
        CardName = Str(CardValue) [4]
End Select
```

Allow: omission of Str

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5 (a) (i)

N	i	j	Temp	1	2	3	4	5
				11	16	13	7	8
5								
	1	1						
		2			13	16		
		3				7	16	
		4					8	16
		5						
	2	1						
		2			7	13		
		3				8	13	
		4						
	3	1		7	11			
		2			8	11		
		3						
	4	1		<i>final values are:</i>				
		2		7	8	11	13	16

Terminates at 5 and 4 respectively

Must be:

- Preceded by other entries ...
- nothing after the 1, 2 sequence

Note these final values will not be shown on the same row ...

[8]

(ii) To sort / to order/put in ascending order the items (in the array) [1]

(iii) There were no swaps on the last pass / on pass 4 [1]

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(b)

Identifier	Data Type	Description
Num		
N	INTEGER	The number of numbers in the list
i	INTEGER	Loop counter // The number of 'passes' up through the list
j	INTEGER	The <u>index</u> // position in the array
Temp	INTEGER	Description must imply/states the 'swapping' operation

Mark as follows:

INTEGER × 4

[1]

One mark per description

[4]

6 (a) (i) 12

[1]

(ii) 'L'

[1]

Note: quotes are optional – must be upper case L

(b) (i)

Identifier	Data Type	Description
InputString	STRING	The string value input by the user
i	INTEGER	<u>Loop</u> counter // (index) position of an individual character
j	INTEGER	Number of characters in / length of InputString
NextChar	CHAR//CHARACTER	(Single) character within InputString / from string input by the user
NewString	STRING	The string formed/made/created//output Allow: if "by the user" added

[1]

[1]

[1]

[1]

Note: Correct (identifier + the data type + description) needed to score

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```

(ii) // main program
      INPUT MyString
      ChangedString ← RemoveSpaces(MyString) (1)
      OUTPUT ChangedString

      // function definition (1)
      FUNCTION RemoveSpaces(InputString : STRING)
      RETURNS STRING (1)
          DECLARE i :/AS INTEGER } (1)
          DECLARE j :/AS INTEGER }
          DECLARE NextChar :/AS CHAR } (1)
          DECLARE NewString :/AS STRING }

          NewString = "" (1)

          j ← CharacterCount(InputString)
          FOR i ← 1 TO j
              NextChar ← OneChar(InputString, i)
              IF NextChar <> " "
                  THEN
                      // the & character joins together two strings
                      NewString ← NewString & NextChar
                  ENDIF
          ENDFOR

          (1) (1) only awarded if follows the previous mark

      RETURN NewString //
      RemoveSpaces ← NewString
      ENDFUNCTION

```

[Max 7]

- 7 (a) (i) 165 [1]
- (ii) "YES" Quotes optional [1]
- (iii) 9 [1]
- (iv) 83 [1]

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(b) (i) Use of correct identifiers only to score

Declaration/Commenting of variables

```
MyMessage As String
EncryptString As String
i As Integer
NextNum As Integer
```

At least two variables correctly documented [1]

Input of string ...

Correct syntax (for both prompt and assignment) and ...
Uses the MyMessage identifier [1]

EncryptString set to 'empty string' [1]
Note: Must suggest 'empty' string

For loop ...

FOR – NEXT keywords // (Python) correct indentation [1]

Correct start/end boundaries [1]

Note: the end boundary must use the language length
function/method //alternative Python syntax

Isolate single character [1]

Use of language functions to calculate new number and
Assigned to NextNum [1]

Conversion of NextNum to a character and concatenated
to EncryptString [1]

Correct syntax for output of EncryptString [1]

[MAX 8]

SAMPLE CODE

PYTHON

```
MyMessage = input("Enter message : ")
EncryptString = ""
for i in range(0, len(MyMessage)) :
    NextNum = ord(MyMessage[i]) + 3
    EncryptString = EncryptString + chr(NextNum)
print(EncryptString)
```

Alternative solution:

```
MyMessage = input("Enter message : ")
EncryptString = ""
for NextChar in MyMessage :
    NextNum = ord(NextChar) + 3
    EncryptString = EncryptString + chr(NextNum)
print(EncryptString)
```

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VB

```

Dim MyMessage, EncryptString As String
Dim NextNum, i As Integer
Console.Write("Enter message : ")
MyMessage = Console.ReadLine()
EncryptString = ""
For i = 1 To Len(MyMessage)
    NextNum = Asc(Mid(MyMessage, i, 1)) + 3
    EncryptString = EncryptString + Chr(NextNum)
Next
Console.WriteLine(EncryptString)

```

Alternatives:

```

GetChar(MyMessage, i)
MyMessage.Substring(i, 1)

```

Allow: Use of InputBox and MsgBox

Alternative solution :

```

Dim MyMessage, EncryptString As String
Dim NextNum, i As Integer
Console.Write("Enter message : ")
MyMessage = Console.ReadLine()
EncryptString = ""
For i = 0 To Len(MyMessage) - 1
    NextNum = Asc(MyMessage.Chars(i)) + 3
    EncryptString = EncryptString + Chr(NextNum)
Next
Console.WriteLine(EncryptString)

```

PASCAL

```

var
    MyMessage, EncryptString : string;
    NextNum, i : integer;
begin
    write('Enter message : ');
    readln(MyMessage);
    EncryptString := '';
    for i := 1 to length(MyMessage) do
        begin
            NextNum := ord(MyMessage[i]) + 3;
            EncryptString := EncryptString + chr(NextNum);
        end;
    writeln(EncryptString);
end.

```

- (ii) For each/every character [1]
 A replacement character is 'calculated' from its ASCII value // or by example ... [1]