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**	[1]
2	1	0	**0**	[1]
3	0	1	**0**	[1]
4	0	0	**0**	[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:

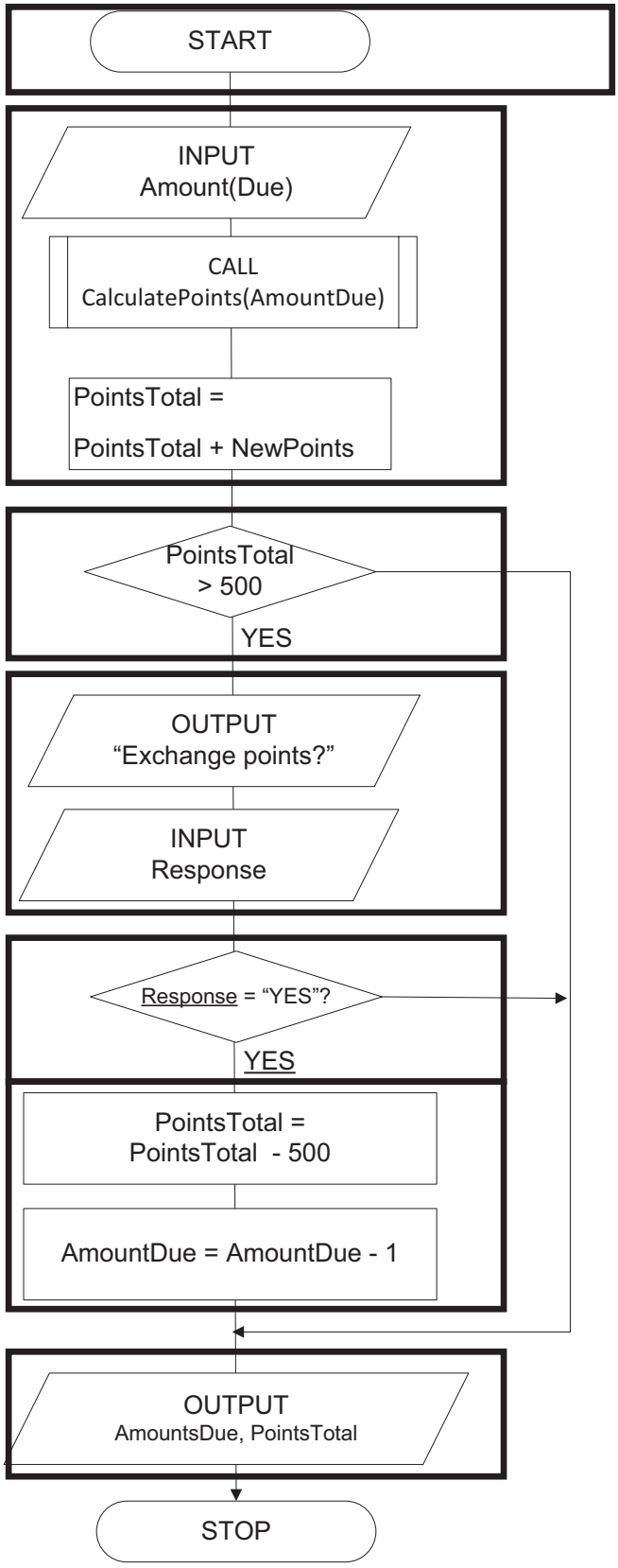
Structure: `IF – THEN – ELSE – ENDIF` [1]

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

3



START and STOP/END to score

A. CALCULATE points total

In general – accept descriptive assignment statements

Condition + at least one label to score

A. True/Tick

Allow yes/Yes/missing quotes

[Max 6]

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

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)
End Select
```

[4]

Allow: omission of Str

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			*final values are:*				
		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]

(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 index // 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	Loop counter // (index) position of an individual character	[1]
j	INTEGER	Number of characters in / length of InputString	[1]
NextChar	CHAR//CHARACTER	(Single) character within InputString / from string input by the user	[1]
NewString	STRING	The string formed/made/created//output Allow: if "by the user" added	[1]

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

(ii)

```
// main program
INPUT MyString
ChangedString ← RemoveSpaces(MyString)
OUTPUT ChangedString

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

   NewString = ""

   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

RETURN          NewString //
RemoveSpaces ← NewString
ENDFUNCTION
```

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

[Max 7]

7 (a) (i) 165 [1]

(ii) "YES" Quotes optional [1]

(iii) 9 [1]

(iv) 83 [1]

(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)
```

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]