

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2015 series

9608 COMPUTER SCIENCE

9608/21

Paper 2 (Written Paper), maximum raw mark 75

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- 1 (i) 40 [1]
- (ii) 314.2(0) [1]
- (iii) 16 // ERROR as identifier Z has not been declared [1]
- (iv) TRUE [1]
- 2 (i) (Single) software program [1]
 Features for:
 program editor/writing/editing
 translation // interpreter/compiler
 testing program code // observe outputs } 2 points to score [1]
- (ii) Syntax checking (on entry)
 Structure blocks (e.g. IF structure and loops begin/end highlighted)
 General prettyprint features
 Automatic indentation
 Highlights any undeclared variables
 Highlights any unassigned variables
 Commenting out/in of blocks of code
 Visual collapsing / highlighting of blocks of code
 Single stepping
 Breakpoints
 Variable/expressions report window [MAX 3]

3 (a)

Test Case	Inputs		Output	
	InA	InB	OutZ	
1	TRUE	TRUE	FALSE	[1]
2	TRUE	FALSE	TRUE	[1]
3	FALSE	TRUE	TRUE	[1]
4	FALSE	FALSE	TRUE	[1]

(b) IF InA = TRUE AND InB = TRUE
 THEN
 OutZ ← FALSE
 ELSE
 OutZ ← TRUE
 ENDIF

Mark as follows

Structure: IF - THEN - ELSE - ENDIF [1]

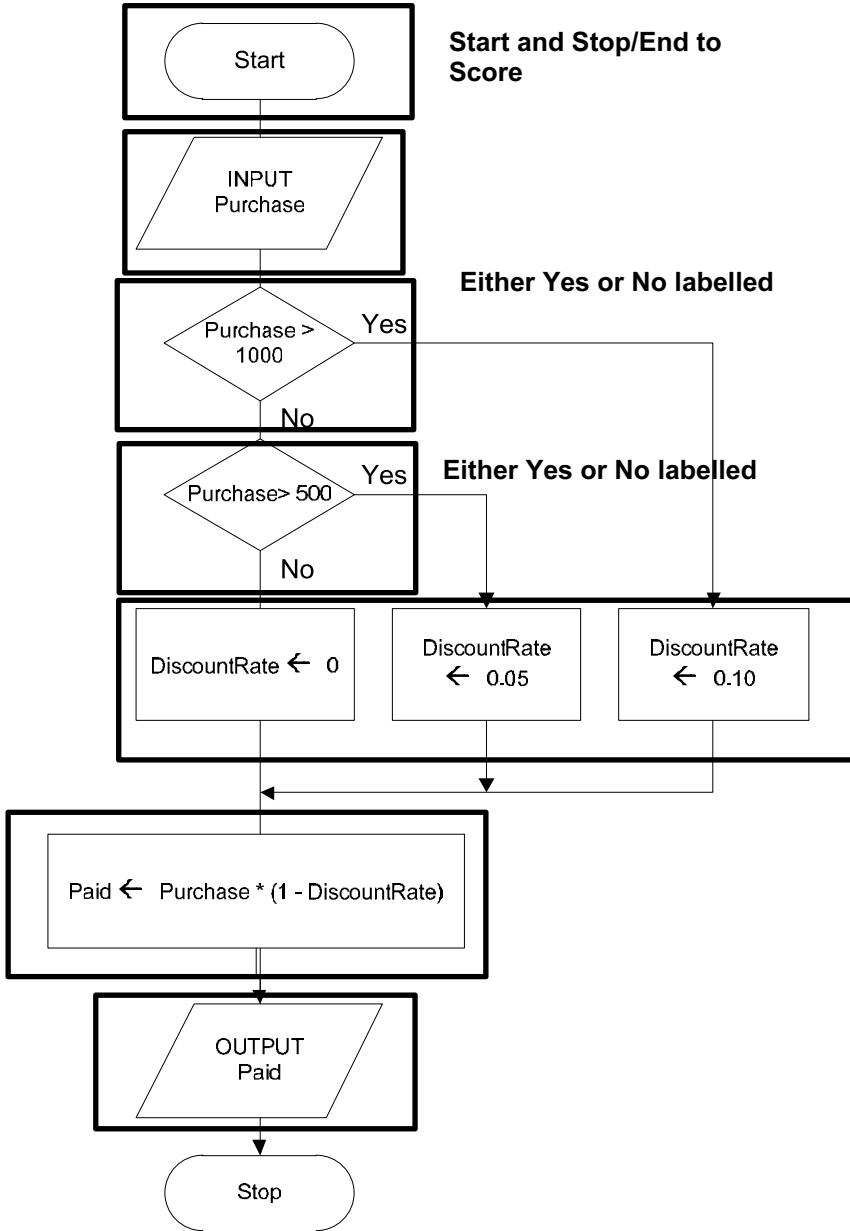
Condition: InA = TRUE AND InB = TRUE [1]

Logic: OutZ ← FALSE (when condition true)}
 OutZ ← TRUE (when condition false)} [1]

Alternative answer (worth 3 marks):

OutZ ← NOT(InA AND InB)
 OutZ ← NOT InA OR NOT InB

4



Start and Stop/End to Score

[MAX 6]

[Total: 6]

Either Yes or No labelled

Either Yes or No labelled

[MAX 6]

5 (a)

Identifier	Data type	Description	
YearCount	INTEGER	Loop counter /// Age of the car	[1]
PurchasePrice	INTEGER	Purchase price of the car	[1]
CurrentValue	REAL // CURRENCY Allow: SINGLE Refuse: DOUBLE	The changing depreciated value	[1]

Must have correct identifier + Data type + Description to score

(b) OUTPUT "Enter Purchase price"

INPUT PurchasePrice
CurrentValue ← PurchasePrice [1]

YearCount ← 1
WHILE **YearCount** < 9 AND **CurrentValue** >= 1000 [2]

Note: Penalise: inclusion of \$

IF **YearCount** = 1 [1]
THEN

CurrentValue ← CurrentValue * (1 - 40/100)

ELSE

CurrentValue ← **CurrentValue** * 0.8 [1]

ENDIF

OUTPUT YearCount, CurrentValue

YearCount ← **YearCount** + 1 [1]

ENDWHILE

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- 6 (a) Combination of staff and task number // the pair of numbers // the pair of random numbers [1]
 //there will be duplicates /repeats//some staff tasks will not be generated [1]
- (b) (i) 04 // 03 [1]
 (ii) 27 // 28 [1]
 (iii) 20 [1]
 (iv) 11 / 12 [1]
- (c) (i) Zero [1]
 (ii) Completed <> 60 // NewStaffTask = FALSE [1]
 Allow: Inclusion of the WHILE
 (iii) Determines whether this combination of StaffNum and TaskNum has been completed [1]
 Assigns value TRUE if not already generated [1]
 Flags that this is the first time this staff + task has been selected/to exit the loop [1]
 Outputs the new staff + task number [1]
 [MAX 3]
- (iv) TaskGrid : ARRAY[1:5, 1:12] OF BOOLEAN
 1 mark | 1 mark [2]

(d) **Pseudocode ...**

(SELECT) CASE (OF) + ENDCASE using StaffNo
 1 mark 1 mark

(CASE) 1: StaffName ← "Sadiq" 1
 (CASE) 2: StaffName ← "Smith"
 (CASE) 3: StaffName ← "Ho"
 (CASE) 4: StaffName ← "Azmah"
 (CASE) 5: StaffName ← "Papadopolis"
 (all four cases ...) 1

ENDCASE // ENDSELECT [4]

Visual Basic

```
Select Case StaffNo
  Case 1
    StaffName = "Sadiq"
  Case 2
    StaffName = "Smith"
  Case 3
    StaffName = "Ho"
  Case 4
    StaffName = "Azmah"
  Case 5
    StaffName = "Papadopolis"
End Select
```

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- 7 (a) (i) CAT [1]
Ignore any opening + closing quotes
- (ii) 13 [1]
- (iii) 83 [1]
- (iv) 15 [1]

- (b) *Input of string ...*
- Correct syntax (for both prompt and assignment) }
Uses MyString identifier } [1]
- StringTotal set to 0 [1]
- FOR loop:*
- FOR - NEXT keywords // (Python) correct indentation [1]
Correct start and /end boundaries [1]
Note: the end boundary must use the language length
function/method // alternative Python syntax
- Isolate single character number [1]
- Followed by the use of Asc (VB) // Ord (Python) }
Assigned to NextNum } [1]
- Added to StringTotal [1]
- Correct syntax for the output of the string and number [1]

[MAX 6]

Python ...

```
MyString = input('key in string')

StringTotal = 0
for i in range (0, len(MyString)):
    NextNum = ord(MyString[i])
    StringTotal = StringTotal + NextNum

print(MyString, StringTotal)
```

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Visual Basic...

```
Dim MyString As String
Dim StringTotal As Integer
Dim i As Integer
Dim NextNum As Integer

Console.Write("key in string")
MyString = Console.ReadLine
StringTotal = 0
For i = 1 To Len(MyString) // MyString.Length
    NextNum = Asc(Mid(MyString, i, 1))
    StringTotal = StringTotal + NextNum
Next

Console.WriteLine(MyString & " " & Str(StringTotal))
```

Pascal ...

```
VAR MyString      : String ;
VAR StringTotal  : Integer ;
VAR i            : Integer ;
VAR NextNum      : Integer ;
VAR SingleChar   : Char;

begin
    Writeln('key in string');
    readln(MyString) ;
    StringTotal := 0 ;

    For i := 1 To Length(MyString) do
        begin
            SingleChar := MyString[i] ;
            NextNum := Ord(SingleChar) ;
            StringTotal := StringTotal + NextNum ;
        end ;

    Writeln(MyString, StringTotal) ;

    ReadLn() ;
End.
```

- (c) Used to provide an integrity/verification check [1]
 Used as a checksum [1]
 The total can be recalculated by the receiving software [1]
 If any of the characters have been incorrectly transmitted the recalculated total and transmitted total will not match [1]
 [MAX 2]

8 (a) r [1]
Ignore inclusion of any quotes

(b) (i) 2 [1]
Ignore inclusion of any quotes for part (i), (ii) and (iii)

(ii) + [1]

(iii) 7 [1]

(c) (i)

N1	N2	N3	N4	BottomAnswer	Op	TopAnswer	OUTPUT
2	5	3	8	40	-	1	1/40

[2]

(ii)

N1	N2	N3	N4	BottomAnswer	Op	TopAnswer	OUTPUT
3	4	1	4	16	+	16	1

[2]

(iii)

N1	N2	N3	N4	BottomAnswer	Op	TopAnswer	OUTPUT
7	9	2	3	27	+	39	
						12	
							1 12/27

[3]

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- (d) (i) Adaptive (maintenance) [1]
- (ii) Allow more than two fractions to be added [1]
 Numerator/denominator more than 1 digit [1]
 Multiply and division also possible [1]
 Allow brackets [1]
 Give answer as decimal number [1]
 Lowest possible denominator [1]
 Trap any fraction which has a zero numerator [1]
 Allow the input of vulgar fraction(s) [1]

[MAX 3]