

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the May/June 2015 series

9608 COMPUTER SCIENCE

9608/23

Paper 2 (Written Paper), maximum raw mark 75

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1 (a)

Identifier	Data Type	Description
HorseName	STRING	Name of the horse
NumberOfPreviousWins	INTEGER	Number of previous wins
RacePenaltyWeight	INTEGER / REAL / SINGLE	Penalty weight

[1]

(b) (i) Stepwise refinement // top-down design

[1]

(ii) INPUT HorseName
 INPUT NumberOfPreviousWins
 RacePenaltyWeight ← 0
 IF NumberOfPreviousWins = 1 OR NumberOfPreviousWins = 2
 THEN
 RacePenaltyWeight ← 4
 ENDIF
 IF NumberOfPreviousWins > 2
 THEN
 RacePenaltyWeight ← 8
 ENDIF
 OUTPUT HorseName, RacePenaltyWeight

Mark as follows:

(OUTPUT) + INPUT x 2 (1 mark)
 Two/three conditions in evidence correctly formed (1 mark)
 (penalise Assignment used for equals)
 Condition for penalty weight = 0 + assignment = 0 (1 mark)
 Other conditions X 2 + Assignment of 4 and 8 (1 mark)
 Final output of horse name + penalty weight (1 mark)

[5]

2 (a) (i) 7

[1]

(ii) 2
 9

[2]

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(b) (i)

Input value	Output			Comment
	Fifty Dollar	Twenty Dollar	Ten Dollar	
70	1	1	0	Least possible number of notes
85	(0	0	0)	Error message
130	2	1	1	Least possible number of notes
600	(0	0	0)	Error message

Penalise any number entries on the 85 and 600 rows

[3]

(ii) INPUT **Amount**

IF Amount > 500

THEN

OUTPUT "Refused - amount too large"

ELSE

IF (**Amount MOD 10**) <> 0 / >0

THEN

OUTPUT "Refused - not a multiple of \$10"

ELSE

FiftyDollar ← Amount DIV 50

Temp ← **Amount MOD 50 //**

(Amount - 50 * FiftyDollar)

TwentyDollar ← **Temp DIV 20 //**

(Amount MOD 50) DIV 20

Temp ← **Temp MOD 20**

TenDollar ← Temp DIV 10

ENDIF

ENDIF

[max 5]

3 (i)

A	Width	in any order
B	Length	
C	JobID	
D	CustomerName	in any order
E	JobCost	

[5]

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- (ii) PROCEDURE CalculateJobCost
 (BYREF JobCost : INTEGER/CURRENCY/REAL,
 BYVALUE Length : INTEGER,
 BYVALUE Width : INTEGER)

mark as follows:

identifier + data type × 3	(3 marks)	
jobcost (only) BYREF	(1 mark)	
length, width (only) BYVALUE/BYREF	(1 mark)	[5]

- 4 (a) (i) ERROR [1]
- (ii) parityerrorcheck [1]
- (iii) Binary Coded Decimal // Binary ▼ Coded ▼ Decimal [2]

- (b) (i) OPENFILE "DISPENSERS" FOR WRITE (1 mark)
- REPEAT (1 mark)
- OUTPUT "Enter dispenser code (XXXXX to end)"
- INPUT DispenserCode
- IF DispenserCode <> "XXXXX"
- THEN
- OUTPUT "Enter bank code ..."
- INPUT BankCode
- LineString ← CONCAT(DispenserCode, "▼", BankCode) (1 mark)
- // now write the new line to the file
- WRITEFILE ("DISPENSERS"), LineString (1 mark)
- ENDIF
- UNTIL DispenserCode = "XXXXX" (1 mark)
- CLOSE ("DISPENSERS") // CLOSEFILE (1 mark)
- OUTPUT "DISPENSERS file now created" [6]

- (ii) • Bank code/ Dispenser code is digit characters only
- Bank code is exactly 3 digits // Dispenser code is exactly 5 digits
- Range check on Bank code between 1 and 999
- // range check on dispenser code between 1 and 99999

Note: If no reference made to either Bank code or Dispenser code MAX 1 [max 2]

- (iii) data of the existing 15 dispensers will be lost/overwritten [1]
- (iv) Append // Illustrated with program code statement [1]

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(c) *Mark as follows:*

- Variables declared/commented (at least X2) (1 mark)
- Input of 'ThisBank' with prompt (1 mark)

- File open statement (1 mark)
- File mode is 'Input' (1 mark)
- File close

- Loop (Not a FOR loop) (1 mark)
- Until all records considered

- Isolate LineBankCode (1 mark)
- Isolate LineDispenserCode

- Count initialised (1 mark)
- Count incremented (1 mark)

- Output – List of dispenser codes (1 mark)
- Output – dispenser count (1 mark)

[max 10]

Visual Basic ...

```

Dim DispenserRecord As String
Dim DispenserCode As String : Dim Bank As String
Dim DispenserCount As Integer
Dim ThisBank As String
FileOpen(1, "C:\DISPENSERS.txt", OpenMode.Input)

Console.WriteLine()
Console.Write("Which bank ..(Three digit code)? ")
ThisBank = Console.ReadLine

DispenserCount = 0
Do
    DispenserRecord = LineInput(1)
    DispenserCode = Left(DispenserRecord, 5)
    Bank = Mid(DispenserRecord, 7, 3)

    If Bank = ThisBank Then
        DispenserCount = DispenserCount + 1
        Console.WriteLine(DispenserCode)
    End If
Loop Until EOF(1)
FileClose(1)

Console.WriteLine()
Console.WriteLine("There are " & DispenserCount & " dispensers
for this bank")

```

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Python ...

```
# DispenserLine      - String
# DispenserCode      - String
# Bank                - String
# DispenserCount     - Integer
# ThisBank           - String

MyFile = open("c:\DISPENSERS.txt", "r")

ThisBank = input("Which bank ..(Three digit code)? ")

DispenserCount = 0
while 1:
    DispenserLine = MyFile.readline()
    if not DispenserLine:
        break
    DispenserCode = DispenserLine[0:5]
    # slices chars 0,1,2,3,4
    Bank = DispenserLine[6:9] # slices chars 6,7,8

    if Bank == ThisBank:
        DispenserCount = DispenserCount + 1
        print(DispenserCode)

MyFile.close()
print
print("There are " + str(DispenserCount)
" dispensers for this bank")
```

Pascal ...

```
var DispenserRecord   : String ;
var DispenserCode     : String ;
var Bank              : String ;
var DispenserCount    : Integer ;
var ThisBank          : String ;
var TheFile           : Text ;

begin
assign(TheFile, 'K:\DISPENSERS.txt') ;
reset(TheFile) ;

WriteLn() ;
Write('Which bank ..(Three digit code)? ') ;
ReadLn(ThisBank) ;
C
DispenserCount := 0 ;
repeat
    readln(TheFile, DispenserRecord) ;
    DispenserCode := Copy(DispenserRecord,1, 5) ;
    Bank := copy(DispenserRecord, 7, 3) ;

    If Bank = ThisBank Then
        begin
            DispenserCount := DispenserCount + 1 ;
```

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```
        Writeln(DispenserCode)
    end ;

    until EOF(TheFile) ;
    close(TheFile) ;

writeln() ;
writeln('Dispenser count: ', DispenserCount) ;

readln ;
end.
```

- 5 (a) (i) • Set of data items have a common name (1 mark)
• Items are referenced using a subscript/index (1 mark)
• Accept: all data items are of the same data type (1 mark) [max 2]
- (ii) 24 [1]
- (iii) • The total number of amplifiers 'produced' by workers 1, 2 and 3/three workers (1 mark)
• on day 2_ (1 mark) [2]

(b)

WorkerNum	DayNum	WorkerAverage	OUTPUT	WorkerTotal		
				1	2	3
1				0		
2					0	
3						0
1	1			10		
	2			21		
	3			31		
	4			45		
2	1				20	
	2				36	
	3				60	
	4				80	
3	1					9
	2					20
	3					33
	4					50
1		2.25				
2		2				
3		1.25	INVESTIGATE 3			

[8]

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- (c) (i) WorkerNum : INTEGER (1 mark)
 DayNum : INTEGER (1 mark)
 WorkerTotal : ARRAY OF INTEGER
 (1 mark) (1 mark)
 WorkerAverage : REAL (1 mark) [max 4]

- (ii) PROCEDURE AnalyseProductionData (NumDays : INTEGER, NumWorkers : INTEGER)

```

FOR WorkerNum ← 1 TO 3
    WorkerTotal [WorkerNum] ← 0
ENDFOR

FOR WorkerNum ← 1 TO 3
    FOR DayNum ← 1 TO 4
        WorkerTotal [WorkerNum] ← WorkerTotal [WorkerNum] +
            ProductionData [WorkerNum, DayNum]
    ENDFOR
ENDFOR

FOR WorkerNum ← 1 TO 3
    WorkerAverage = WorkerTotal [WorkerNum] / (4) *
    DailyHoursWorked [WorkerNum]
    IF WorkerAverage < 2
        THEN
            OUTPUT "Investigate" WorkerNum
        ENDIF
ENDFOR

ENDPROCEDURE
    
```

Mark as follows:

All '3's changed to NumWorkers

All '4's changed to NumDays

WorkerAverage '4' changed to NumDays [3]

- (iii) (CALL) AnalyseProductionData (7, 13) [1]