GradeMax

www.PapaCambridge.com

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

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

GradeMax

www.PapaCambridge.com

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 (penalise Assignment used for equals)	(1 mark)
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]

GradeMax

www.PapaCambridge.com

(b) (i)

Input value	Output			Comment
Amount	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]

GradeMax

www.PapaCambridge.com

(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]

GradeMax

www.PapaCambridge.com

(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")
```

GradeMax

www.PapaCambridge.com

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 ;
```

GradeMax

www.PapaCambridge.com

```
            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]

GradeMax

www.PapaCambridge.com

(b)

				WorkerTot…		
WorkerNum	DayNum	WorkerAverage	OUTPUT	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]

GradeMax

www.PapaCambridge.com

(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]