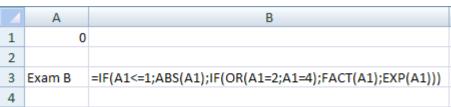
Solutions to Exam B

January 2010

1)

i) If A1 plays the role of the variable x, then one possible way of writing the function is:



The values of the function at 0 and 6 are simply f(3)=20.0855 and f(6)=403,429.

Marking: 2 marks will be awarded for the correct values of f(3) and f(6). The remaining 10 marks will be awarded for a correct function, with 7 marks for the correct structure and 3 marks for using the correct Excel Built-in functions for factorial, exponential and absolute value.

ii) In order to answer part ii) it is convenient to re-write the functions in a form similar to part i). If we call the first function g(x) and the second function h(x), they are:

$$g(x) = \begin{cases} x^2 & \text{for} \quad x \le 1\\ x^4 & \text{otherwise} \end{cases}$$

$$h(x) = \begin{cases} 0 & \text{for} \quad x < 0 & \text{or} \quad x = 1\\ 1 & \text{for} \quad 1 < x < 2 & \text{or} \quad 0 \le x < 1\\ x^2 & \text{otherwise} \end{cases}$$

Therefore, for function g(x), the function is zero at x=0 and is positive everywhere else. The function h(x) vanishes for x=1 and x<0 and is positive everywhere else. *Marking: 6 marks for correct answer for function* g(x) *and 7 marks for correct answer for function* h(x).

🚈 Microsoft Visual Basic - Exams.xlsm - [Module2 (Code)]
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(General) epc2
<pre>Function epc2(ye As Integer, bo As String) As Single y1 = Application.WorksheetFunction.VLookup(ye, [b6:f7], 2, False) y2 = Application.WorksheetFunction.VLookup(ye, [b6:f7], 3, False) y3 = Application.WorksheetFunction.VLookup(ye, [b6:f7], 4, False) y4 = Application.WorksheetFunction.VLookup(ye, [b6:f7], 5, False) x1 = Application.WorksheetFunction.VLookup(ye, [b4:f5], 2, False) x2 = Application.WorksheetFunction.VLookup(ye, [b4:f5], 3, False) x3 = Application.WorksheetFunction.VLookup(ye, [b4:f5], 4, False) x4 = Application.WorksheetFunction.VLookup(ye, [b4:f5], 4, False) x4 = Application.WorksheetFunction.VLookup(ye, [b4:f5], 5, False) If bo = "Haringey" Then epc2 = (x1 + x2 + x3) * 1000 / x4 ElseIf bo = "Harrow" Then epc2 = (y1 + y2 + y3) * 1000 / y4 Else epc2 = "this borough is not on the list"</pre>
End If End Function

epc(2007,"Harrow")= 4,454008

Marking: 8 points for the correct IF...ELSEIF structure, 4 points for correct definition of input and output data type, 8 points for correct use of Vlookup functions, 3 points for correct formulae for epc and 2 points of correct value of epc(2007, "Harrow").

3)

```
Function timetable(x As Date) As String
Select Case Month(x)
Case 6, 7, 8: timetable = "Not available"
Case Else:
Select Case Weekday(x)
Case 2, 4, 6: timetable = "Available between 11:00 and 12:00"
Case 3, 5: timetable = "Available between 14:00 and 17:00"
Case Else: timetable = "Not available on weekends"
End Select
End Select
End Function
```

TIMETABLE(1967-09-13)= "Available between 11:00 and 12:00"

Marking: 12 points for the correct SELECT CASE structures, 4 points for correct definition of input and output data type, 6 points for correct use of Month and Weekday functions, 3 points for correct value of TIMETABLE(1967-09-13).

```
Function wave(na As String) As Variant
If na = "Smith" Or na = "Patel" Or na = "Hussain" Or na = "Solanki" Then
c1 = Application.WorksheetFunction.HLookup("M1", [b1:e2], 2, False)
c2 = Application.WorksheetFunction.HLookup("M2", [b1:e2], 2, False)
c3 = Application.WorksheetFunction.HLookup("M3", [b1:e2], 2, False)
c4 = Application.WorksheetFunction.HLookup("M4", [b1:e2], 2, False)
s1 = Application.WorksheetFunction.VLookup(na, [a3:e6], 2, False)
s2 = Application.WorksheetFunction.VLookup(na, [a3:e6], 3, False)
s3 = Application.WorksheetFunction.VLookup(na, [a3:e6], 4, False)
s4 = Application.WorksheetFunction.VLookup(na, [a3:e6], 5, False)
wave = (s1 * c1 + s2 * c2 + s3 * c3 + s4 * c4) / (c1 + c2 + c3 + c4)
Else
wave = "not on record"
End If
End Function
```

```
wave("Smith")= 61,42727273
```

Marking: 8 points for the correct HLOOKUP functions, 8 points for correct VLOOKUP functions, 6 points for correct formula, 3 points for correct value of wave("Smith").