Group A (Solution)

1) i) =IF(x>=0, SQRT(7*x^3),"value is complex") [8]

$f(-5)$ =value is complex, $f(31) = 456.6585157$ [2]

ii) [7+6]

$$f(x) = \begin{cases} x^3/5 & \text{for} \quad x \le -15 \\ \exp x & \text{for} \quad -15 < x \le 6 \\ \sin x & \text{for} \quad 6 < x \le 10 \\ x^3/5 & \text{for} \quad 10 < x \end{cases} \qquad g(x) = \begin{cases} 0 & \text{for} \quad x \le -1 \\ 1/2 & \text{for} \quad -1 < x \le 9 \\ 0 & \text{for} \quad 9 < x \end{cases}$$

$f(0) = 1$, $g(0) = 1/2$, $f(15) = 675$, $g(15) = 0$ [2]

2) Function sumcol(cond As String, ca As Integer) As Variant [20]

```
    Select Case ca
    Case 1: sumcol = WorksheetFunction.SumIf([A1:A10], cond, [A1:A10])
    Case 2: sumcol = WorksheetFunction.SumIf([A1:A10], cond, [B1:B10])
    Case 3: sumcol = WorksheetFunction.SumIf([A1:A10], cond, [C1:C10])
    Case 4: sumcol = WorksheetFunction.SumIf([A1:A10], cond, [D1:D10])
    Case Else: sumcol = "Only case 1,2,3 or 4 can be used!"
    End Select
End Function
```

=condsum(">0",4)→ 2008, =condsum("<>0",2)→ 260, [5]

=condsum("<50",2)→ 211, =condsum("<=3",3)→ 25

3) Function days(x As Date, y As Date) As String [20]

```
Dim day1, day2 As Integer
    day1 = Weekday(x)
    day2 = Weekday(y)
    If day1 = day2 Then
        If day1 = 1 Then
            days = "Both dates fall on a Sunday."
        Else
            days = "Both dates fall on the same day of the week."
        End If
    Else
        days = "The weekdays for the two dates are different."
    End If
End Function
```

Isaac Newton and Stephen Hawking are born on the same weekday. [5]

4) Function CW(sb1 As String, n1 As Integer, sb2 As String, n2 As Integer) As Double [21]

```
' this function calculates molecular weights
    Dim w1, w2 As Single
    w1 = WorksheetFunction.VLookup(sb1, [A1:D110], 4, False)
    w2 = WorksheetFunction.VLookup(sb2, [A1:D110], 4, False)
    CW = Round(n1 * w1 + n2 * w2, 2)
End Function
```

$KO_2 \rightarrow 71.1$ and $As_4S_4 \rightarrow 427.95$ [4]