Assignment 2: Excel Functions

Solution Instructor: Trani

Show all your work including VBA code and results of your computation in the spreadsheet as screen captures.

Problem 1

```
Function Deflection(w0, E, I, x, L)

' Output
' Deflection of beam at station x (m)

' Inputs
' wo - Load (N/m)
' x - Station (m)
' L = Length of beam (m)
' E - Modulus of elasticity (N/m-m)
' I - Moment of inertia (m-m-m-m)

Deflection = (w0 * x ^ 2) * (10 * L ^ 3 - 10 * x * L ^ 2 + 5 * L * x ^ 2 - x ^ 3) / (120 * L * E * I)

End Function
```

```
Function Maximum_Deflection(w0, E, I, L)

' Output
' Maximum_Deflection in meters

' Inputs
' wo - Load (N/m)
' x - Station (m)
' L = Length of beam (m)
' E - Modulus of elasticity (N/m-m)
' I - Moment of inertia (m-m-m-m)

Maximum_Deflection = (w0 * L ^ 4) / (30 * E * I)

End Function
```

Problem 2

```
Function Drag(rho, v, A, Cd)

' Output
' Drag force (N)

' Inputs
' rho- lair density (kg/cu.m)
' v - train speed (m/s)
' A - reference area (m-m)
' Cd - drag coefficient (dim)

Drag = 0.5 * (rho * (v ^ 2) * A * Cd)

End Function
```

```
Function Power(rho, v, A, Cd)

' Output
' Power (N-m/s)

' Inputs
' rho- Air density (kg/cu.m)
' v - Train speed (m/s)
' A - Reference area (m-m)
' Cd - Drag coefficient (dim)

Power = 0.5 * (rho * (v ^ 3) * A * Cd)

End Function
```

Problem 3

```
Function Lateral_displacement(k1, t, k2, k3, w)

' Output
' Lateral_displacement (cm)

' Inputs
' t- Time (s)
' k1, k2, k3 and w are constants of the problem

Lateral_displacement = (Exp(-k1 * t)) * (k2 * Cos(w * t) + k3 * Sin(w * t))

End Function
```

Problem 4

Row Labels	Count of Airport ID	Sum of Air Carrier Passengers
??	1	-
AK	187	2,897,515
AL	54	1,381,019
AR	55	696,676
AS	1	23,546
AZ	46	18,590,518
CA	167	65,758,980
CO	44	17,182,539
CQ	3	55,624
CT	13	3,037,199
DC	2	12,076,355

Problem 5

A	B
Interest Rate (%)	4.20%
Amount of Loan ($)	3.56E+08
Number of Months	360
Monthly Payment ($)	($1,740,901.14)
Formula	PMT(F3/12,F5,F4)
Sanity Check	
Amount Paid with Inter	($626,724,409.83)