**Assignment 1**

**Cost Data (Excel application)**

1.   Consider a firm that has just built a plant, which cost $20,000. Each worker costs $5.00 per hour.  Based on this information and using Excel, fill in the missing information in the table below.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Number of**  **Worker Hours** | **Output** | **Marginal Product** | **Fixed**  **Cost** | **Variable**  **Cost** | **Total**  **Cost** | **Marginal**  **Cost** | **Average**  **Variable**  **Cost** | **Average**  **Total**  **Cost** |
| 0 | 0 | -- |  |  | 20,000 | -- | -- | -- |
| 50 | 400 |  |  |  | 20,250 |  |  |  |
| 100 | 900 |  |  |  | 20,500 |  |  |  |
| 150 | 1300 |  |  |  | 20,750 |  |  |  |
| 200 | 1600 |  |  |  | 21,000 |  |  |  |
| 250 | 1800 |  |  |  | 21,250 |  |  |  |
| 300 | 1900 |  |  |  | 21,500 |  |  |  |
| 350 | 1950 |  |  |  | 21,750 |  |  |  |

2.    How would each of the following affect the firm's marginal, average, and average variable costs?

1. An increase in wages
2. A decrease in material costs
3. The government imposes a fixed amount of tax
4. The rent that the firm pays on the building that it leases decreases.

**Solution Guide**

***Question 1***

* The total fixed cost is the cost of the plant, i.e., $20,000.
* Variable cost = Total cost - Fixed cost
* Marginal Product = Change in Total Product (or Output) divided by the Change in the Variable Input (which in this case is the Number of Worker Hours)

For example, when the number of work hours increases from 50 to 100, total product (or output) increases from 400 to 900 units.  Therefore, MP = (900-400) ÷ (100-50) = 500 ÷ 50 = 10 when the total product (or output) produced is 900.

* Average Variable Cost = Variable Cost divided by the Output
* Average Total Cost = Total Cost divided by the Output
* Marginal Cost = Change in Total Cost divided by the change in Output

For example, when the total output increases from 400 to 900 units, the total cost increases from 2,250 to 2,500.  Therefore, MC = (2,500 – 2,250) ÷ (900-400) = 250 ÷ 500 = 0.5 when the output is 900.

***Question 2***

You have to figure what types of cost are wages, cost of material, government fixed tax, and rent/lease.  Are they fixed or variable? Once you determine that, you will be able to figure out what costs will be affected by these changes.