Total Marks: 30

NOTE: READ AND STRICTLY FOLLOW ALL THESE INSTRUCTIONS BEFORE SOLVING THE ASSIGNMENT.

- This assignment covers lecture # 1 – 38
- Do not use Red color in your assignment. It is used for marking purposes only
- Last date for submission is **12 – 06 – 2009.** It means you can submit your assignment till **13 – 06 – 2009, 12'o clock midnight.**
- Make sure that you upload your solution file on VULMS before the due date/time. No solution will be accepted through e-mail after the due date.
- If you have any problem with your VULMS or uploading, then you can send your assignment through e-mail **within the time limit** at mgt613@vu.edu.pk through your vu e-mail account
- Assignment once uploaded on VULMS will not be replaced in any case. So, make sure to upload the correct assignment file.
- Write down only one option in the answer sheet which you think is correct or most appropriate amongst the given options. More than one answer will be marked ZERO.
- Use only MICRO SOFT EXCEL FILE (.xls extension) in the following format:

Answer Sheet to solve the Assignment MGT613

Student ID: ----------

Student Name: ----------

	Question no.	Question Marks	Correct Option
	1	3	
	2	2	
	3	2	
	4	2	
	5	3	
	6	2	
	7	2	
	8	2	
	9	2	
	10	2	
	11	2	
	12	3	
	13	3	
	Total Marks	**30**	

- In the *"Correct Option"* column, write down only the option number (e-g A, B, C, D) against each question number which you consider is the correct one.
- Upload only the answer sheet (as portrayed in above format) in EXCEL FILE on VULMS. Don't upload the whole assignment.
- Cheating or copying of solution is strictly prohibited; NO credit will be given to copied solution.

- Once again please make it sure that you upload the solution in EXCEL Format only and according to above-mentioned "Tabular Format". Do not submit your assignment as a PDF, image, HTML, Notepad, WordPad or MS-Word file; it will be marked as ZERO.

Case

Read the case given below carefully and then answer the questions in the provided excel file.

ABC Corporation is a manufacturing firm that makes daily use home appliances. The recent demand pattern for its products is as follows:

Period	Units
1	56
2	61
3	55
4	70
5	66
6	65
7	72
8	75

Table 1

The firm is deciding to produce a new product. The initial investment is estimated to be Rs.2000. Labor and material cost is Rs.5 per unit. The selling price is set at Rs.10 per unit.

The firm uses 700 units of component 'A' annually in the production of one of its products. The annual carrying cost of the component is Rs: 14 per unit and the ordering cost is Rs: 275. The firm has been offered following discount pricing schedule provided by the supplier for the component 'A':

Order Size	Discount RS.
1 – 199	65
200	59

Table 2

The firm has also started in-house production to ensure higher quality levels. One assembly which requires a reliability of 95% was previously purchased from a local supplier. Now it is being assembled in-house from three parts that each boosts a reliability of 96%. However, customer complaints have risen in 7 months.

If operated around the clock under ideal conditions, one assembly line can produce 100 products per day. Management believes that a maximum output rate of 45 products per day can be sustained economically over a long period of time. Currently, the assembly line is producing an average of 50 products per day.

The firm also makes use of control charts to keep check whether the controls of processes are within statistical limits or not. Operations managers develop P-chart using 3-sigma limits. For this purpose, 20 Sample each of n = 200 observations were taken by machine operators at a workstation in the production process. The number of defective items in each sample was recorded which are given in following chart:

Sample	# of defectives	P	Sample	# of defectives	P
1	12	0.06	11	16	0.08
2	18	0.09	12	14	0.07
3	10	0.05	13	12	0.06
4	14	0.07	14	16	0.08
5	16	0.08	15	18	0.09
6	19	0.095	16	20	0.10
7	17	0.085	17	18	0.09
8	12	0.06	18	20	0.10
9	11	0.055	19	21	0.105
10	14	0.07	20	22	0.110

Table 3

The firm's products are usually transported to three distribution centers named as center X, center Y, center Z. As the demand is expected to increase, the firm is considering to open a new plant. It has three options available where it can start a new plant. Operations managers want to make this location decision by estimating transportation costs. Following table shows the expected increase in annual demand. The annual capacity of each plant is given in the right-hand column of the table. Transportation cost per transport is shown in small boxes. The optimal allocations to each centre to where the products can be sent from the plants are also shown in the table

Source	Distribution Centers			Capacity of plant
	Center X	Center Y	Center Z	
Plant 1	Rs. 4.37	Rs. 4.25 12,000	Rs. 4.89	12,000
Plant 2	Rs. 4.00 6,000	Rs. 5.00 4,000	Rs. 5.27	10,000
Plant 3	Rs. 4.13	Rs. 4.50 6,000	Rs. 3.75 12,000	18,000
Demand	6,000	22,000	12,000	40,000

Table 4

The spare parts department of the firm has the responsibility for maintaining an inventory of spare parts for the products its manufactures. The department classifies the inventory parts according to the ABC system to determine which stock parts should be closely monitored. The parts inventory, unit cost and annual usage are as follows:

Part	Unit cost in Rs.	Annual usage
1	60	90
2	350	40
3	30	130
4	80	60
5	30	100
6	20	180
7	10	170
8	320	50
9	510	60
10	20	120

Table 5

Operations Manager of the firm has also received marketing's latest forecasts of increased sales next year. The manager wants the production line to be designed to make 2,400 products per week for the next three months. The plant will operate 40 hours per week.

After Reading the above case study carefully, write down the correct option number (e-g A, B, C, D) in the provided/given Excel file.

1- What will be the demand of 9th period if the firm uses exponential smoothing forecast with alpha = 0.4 **3 marks**

a. 67.31
b. 70.39
c. 72.19
d. 73.24

2- What volume of demand of new product that the firm is manufacturing would be necessary to break even? **2 marks**

a. 350 units
b. 400 units
c. 420 units
d. 440 units

3- What would be the optimal order size of component A that the firm should order? **2 marks**

a. 165.83 units
b. 157.94 units
c. 160.45 units
d. 170.32 units

4- What will be Total Cost for ordering component A? 2 **marks**

a. Rs. 2362.5
b. Rs. 2321.6
c. Rs. 2465.6
d. Rs. 2222.2

5- Using the calculations from question 3 and 4, determine the amount of the component firm should order; keeping in mind the discount rates offered to the firm by the supplier. **3 marks**

a. 165.83 units
b. 200 units

c. 300 units
e. 700 units

6- What will be the upper control limit for using in p-chart? **2 marks**

a. 0.262
b. 0.125
c. 0.137
d. 0.023

7- Find the lower control limit for using in p-chart **2 marks**

a. 0.023
b. 0.04
c. – 0.1
d. – 0.25

8- What was the status of whole assembly line reliability when firm started in-house operations? **2 marks**

a. There was an increase in reliability
b. There was a decrease in reliability
c. Reliability remains the same
d. None of the above options

9- If the firm wants to continue its in-house assembly production, what level of component reliability is required to restore product to its former level of quality? **2 marks**

a. 0.96
b. 0.95
c. 0.89
d. 0.98

10- What is the utilization of the assembly line relative to the peak capacity? **2 marks**

a. 45 %
b. 50 %
c. 100 %
d. 111 %

11- What should be the line's cycle time to match up the upcoming increased demand?

2 marks

a. 60 units per hour
b. 1 unit per minute
c. 0.016 minute per unit
d. 1 minute per unit

12- Based on the transportation costs, capacity requirements, and capability of each plant to transport the products to distribution centers (given in table 4), which plant location firm should go for?

3 marks

a. Plant 1
b. Plant 2
c. Plant 3
d. Decision can't be made from the information given

13- Under the ABC classification system, which of the following items will be include in Class B with cumulative % of quantity usage of 25%.

3 marks

a. 9, 8, 2, 3
b. 8 , 2, 1
c. 8, 9, 1
d. 1, 4, 3