

## Sample Questions

### Operations

1. Consider the list of activities shown in the table for the manufacture of a washing machine. Which of the following flow of tasks is not correct for the given data?

ACTIVITY	DURATION (WEEKS)	PREDECESSORS
A	2	None
B	3	None
C	3	A, B
D	5	C
E	2	D
F	3	C
G	3	E, F
H	3	E
I	3	E
J	2	G, H, I

- a. ACFGJ  
b. BCDEHJ  
c. ACDEFGJ  
d. BCFGJ  
e. BCDEIJ
2. Which of the following control charts is/are used to study discrete variables?
1. X-bar chart
  2. R chart
  3. p chart
- a. Only 1  
b. Only 2  
c. Only 3  
d. Both 1 and 2  
e. Both 1 and 3

3. When you buy a new car, you are interested to know if there is any complaint from the customers with respect to defective parts being used in the manufacture of the car. Which aspect of quality are you concerned with?
- a. Reliability
  - b. Durability
  - c. Conformance
  - d. Aesthetics

4. A manufacturing company uses two types of machines to produce the final finished goods. The type to be used depends on the demand for goods. During summer, the demand is low and machine A is used while machine B is used during winter when the demand is high. The average demand in summer is 400 and in winter it is 1,200. Assuming that the probability of demand being low or high is equal, what is the expected cost of using Machine B.

	Machine A	Machine B
Fixed cost ( \$ )	None	5000
Variable cost ( \$ )	30	20

- a. \$ 42,000
  - b. \$ 21,000
  - c. \$ 41,000
  - d. \$ 20,500
5. Consider the table given. Your company has to do the flooring and painting at 4 places namely Ridgewood Estate, Wellington House, Belvedere Park and Wood rose Retreat. There are three steps involved in the process and each of these steps must be completed prior to moving on to the next step. You can work on only one job at a time at each step. The due date for the completion of each of the jobs is also given in the table. You decide to use the 'First Come First Served' sequencing rule. Which job will get delayed beyond the due date and what is the average delay?

JOB	Estimated Days			TOTAL TASK TIME	DAYS UNTIL DUE
	Step 1	Step 2	Step 3		
Ridgewood Estate	3	2	3.5	8.5	21
Wellington House	5	2	1	8	20
Belvedere Park	3	2	5	10	10
Wood Rose Retreat	6	4	1	11	15

- None of the jobs will get delayed.
  - The job at Wood Rose Retreat will get delayed by 7 days.
  - The jobs at Belvedere Park and Wood Rose Retreat will get delayed with an average delay of 15 days.
  - The jobs at Belvedere Park and Wood Rose Retreat will get delayed with an average delay of 3.75 days.
6. In a chemical industry, the boiler is operated on a daily basis. The ideal temperature at which it should be operated is 120 degrees. The quality team decides to monitor the operating temperature of the boiler. The team measures the temperature six times a day for a 8 day-period. The team ensures that the process behaves normally during the 8-day period as these samples are to be used to set up control charts. The observations have been tabulated as shown in Table 1. After setting up the control charts, the quality team continues to take samples following the same routine. These results are shown in Table 2. Using the A2, D3, D4 values given, determine whether the process is in control or not.

SAMPLE SIZE 'N'	A2	D3	D4
2	1.88	0	3.27
3	1.02	0	2.57
4	0.73	0	2.28
5	0.58	0	2.11
6	0.48	0	2.00
7	0.42	0.08	1.92
8	0.37	0.14	1.86
9	0.34	0.18	1.82
10	0.31	0.22	1.78
11	0.29	0.26	1.74
12	0.27	0.28	1.72

Table 1		Observation						
Day	1	2	3	4	5	6	X-bar	R
1	120	117	119	121	121	122	120	5
2	123	115	124	119	122	120	120.5	9
3	120	123	125	120	120	126	122.33	6
4	120	121	116	118	116	114	117.5	7
5	122	118	120	120	124	116	120	8
6	125	117	120	119	120	116	119.5	9
7	126	122	120	118	121	124	121.83	8
8	125	123	123	120	117	120	121.33	8

Table 2	
Day	R
9	4
10	5
11	3
12	6
13	7
14	8
15	8

- The process is under control since all the points are within the control limits.
- The process may be out of control since points are beyond the UCL.
- The process may be out of control since points are beyond the LCL.
- The process may be out of control since points are beyond both the UCL and the LCL.

7. Which of the following statements is/are true regarding product customization in the supply chain?

- When customization occurs early in the supply chain, products will tend to be more costly.
- When customization occurs late in the supply chain, the lead times to the customer will tend to be longer.
  - Only statement 1 is true
  - Only statement 2 is true
  - Both the statements are true
  - Both the statements are false

9. You are in charge of ordering items at a department store. , The average daily demand for one of the products is 20 units with a standard deviation of 4. If you order the product directly from the manufacturer, they will take, on an average, 16 days to supply with a standard deviation in lead time of 2. If you wish to ensure 95% service level, what should be the reorder point with safety stock? (z-value = 1.65)

- 381 units
- 391 units
- 445 units
- 462 units