

QUESTIONS

INTRODUCTION TO INDUSTRIAL ENGINEERING TAKE HOME

There is 124 points at total. Write your own comments and answers about the questions. If it is seen that you have directly written the sentences from slides and internet resources, the answers are not accepted. All questions have to be answered. Best wishes...

1. **(24 points)** Why do we use suppliers and subcontractors for? (Between 30-50 word)
 - a. What kind of steps do you have to follow, when you decide taking products from suppliers and subcontractors?
 - b. Create an example of make or buy decision. You have to use graphics and calculations.
 - c. What are the points of selecting right suppliers? (Between 30-50 word)
 - d. Explain each advantage of e-commerce. (Between 20-30 word for each one.)
2. **(32 points)** Please give details about the questions of supply chain management.
 - a. You have learned about the levels of supply chain management. Please give information about each level of supply chain management. "Hint: Why are they used for? What are the main goals of putting them? (Between 30-50 word for each level.)
 - b. Why are safety stocks used for the mass production processes? How can you determine the safety stocks? (Between 30-50 word for each question and verbally these questions are going to be answered)
 - c. What happens when the company order quantities larger than the forecast results for mass production systems? (Between 30-50 word)
 - d. You have learned objectives of logistics strategy from the perspective of minimizing **cost**, minimizing **investment** and maximizing **customer service**. Please try to find max/min of the elements stated below and give details about them. (Between 30-50 word for each element.)
 - i. Product quality
 - ii. Time spent on machines
 - iii. Time spent on quality control
 - iv. Labors
 - v. Flexibility
 - vi. WIP Inventory
 - vii. Inventory
3. **(24 points)** Please give details about the questions of SCM.
 - a. Please explain some of the book objectives of supply chain. (Between 30-50 word for each one.)
 - i. Inventory management
 - ii. Logistics network planning
 - iii. The value of information
 - iv. Centralized and decentralized distribution
 - v. Outsourcing
 - b. Which inventory strategy do you use if you run a company? Make-to-Stock or Make-to-Order. Please explain the reasons. (Between 50-100 Words)
 - c. Give an example about the BOM. It must be an example of with many raw materials and few end products. It must have three levels at least.
 - d. Garvin (1987) suggested eight dimensions or quality performances that are frequently required or desired by the customers. Please give example over products that you would like to choose.
4. **(20 points)** Create a quality function deployment example
 - a. Customer requirements must be at least 5.
 - b. Engineering characteristics must be at least 5

- c. The relationships are identified via strong, medium and small. The numbers are up to you
 - d. Just one company are going to be compared
 - e. Determine the target values.
5. **(24 points)** Please answer the questions.
- a. Obtain the formula of EOQ from the function again. The units are not put on purpose. When you calculate the answer put the units there and give the result.
 - i. Estimated total demand given as 10.000
 - ii. Ordering cost 150
 - iii. Holding cost 0,75
 - b. Create an example of single machine scheduling example and answer it by using SPT, EDD. The machines can not be less than our example solved in the class
 - c. Think about the structure of flow shop scheduling and find the total time for using suitable algorithm.

Job Name	Processing Time on Machine 1	Processing Time on Machine 2
1	4	4
2	5	5
3	8	6
4	1	9
5	2	3
6	2	3

- d. The MRP tables are given below. A company that wants to produce cars must make 40 cars in the first week, 60 cars in the fourth week, 60 cars in the sixth week and 50 cars in the 8th week. Apart from these, 300 Body orders will be received at the beginning of the second week. Also, the 5th week will come with 90 more Wheels. Please create tables and find solutions. After that, comment about the results.

Parts	Order Amount	Lead Time	Inventory
Body	300	2	100
Wheel	200	3	220
Suspension	400	1	50

