



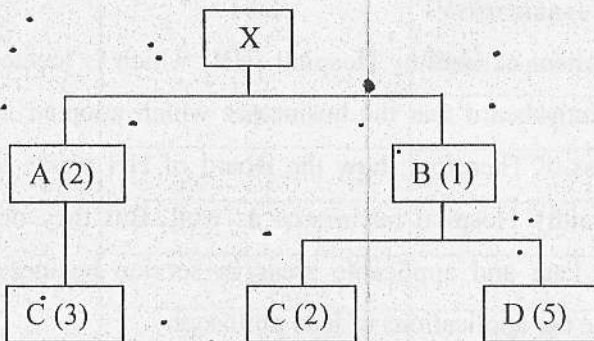
Answer all five questions

Time: 03 hours

- a. "Layout significantly influences the behaviour of people and their perception of the job, ultimately affecting job performance, motivation and satisfaction".  
Identify and briefly explain the advantages of effective and efficient plant layout (06 marks)
- b. State the importance of capacity decisions (06 marks)
- c. Consider a manufacturing enterprise that is suffering from low material productivity, and advise the management how the material productivity could be improved. (08 marks)

(Total 20 marks)

- a) "Japanese JIT buying is superior to U.S traditional buying". What ways the factors differ in each type of buying? (08 marks)
- b) The following information was given by the Honda Company's Purchasing Department about material and components required.



Item	Lead Time (Weeks)
X	2
A	3
B	1
C	2
D	2

Requirements include 112 units of X in week 10

- a) Calculate the needed materials for each item.  
b) Prepare a material requirement plan for X.

- c) Calculate net requirements for each item of materials if you have the following amounts of stock On-Hand.

Item	On-Hand
X	50
A	75
B	25
C	10
D	20

(12 marks)

(Total 20 marks)

3. a) A company purchases single inventory item with an e-mail ordering cost of Rs.200, carrying cost rate of 20% of the cost of the item, and an annual demand of 100,000 units. further information is given below:

Order size	Cost per unit
0 to 4,999 units	Rs.50.00
5000 to 9,999 units	Rs.45.00
10,000 and up	Rs.39.00

What quantity should be ordered to optimize cost? Justify your answer with relevant calculations and suggestions.

(12 marks)

- b) List out the reasons to outsource an activity of a production organization?

(08 marks)

(Total 20 marks)

4. a) You are the consultant of Healthy Hospital (HH) which is located in Batticaloa. The board of HH recently heard that the businesses which adopted lean philosophy have made great success. Therefore, how the Board of HH wants to implement such philosophy in Healthy Hospital businesses as well. But they do not have adequate knowledge about lean and applicable areas in service business like HH. You are required to provide the applications of lean philosophy.

b) - Consider the following data set:

Job sequence	Job operation Time(days)	Job flow time (days)	Job due date (days)
A	5	5	6
B	17	22	20
C	14	36	18
D	9	45	12
E	10	55	12

By using shortest processing time (SPT) rule calculate the following:

- I. Average flow time
- II. Average number of jobs in the system each day
- III. Average job lateness

(10 marks)

(10 marks)

(Total 20 marks)

5. A company interested in balancing a production line that will manufacture an electronic football game to compete with the successful pocket-calculator size model of Mattel. Tasks, performance items, precedence relationships are shown:

Task	Performance Time (Seconds)	Must Follow
A	40	-
B	20	A
C	15	B
D	60	-
E	50	D
F	10	C
G	25	C
H	10	E

I	20	E
J	05	F,G,H,I
K	10	J

a) Construct a precedence diagram for the tasks

(06 marks)

b) To balance the line with a 60 second minimum cycle time, what is the theoretical minimum number of work station? (A seven hour day is worked)

(06 marks)

c) Balance the line with longest operation time-rule, balancing to a 60 second cycle.

(08 marks)

(Total 20 marks)

Task	Performance	Min. follow
E	20	
F	05	
G	05	
H	10	
I	05	
J	10	
K	10	