THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF MECHANICAL ENGINEERING
BACHELOR OF INDUSTRIAL STUDIES – (MANAGEMENT)
FINAL EXAMINATION 2008/2009
MEX 4240 OPERATIONS MANAGEMENT
DATE : 28 March 2009
TIME : 1400 - 1700 hrs
DURATION : Three (03) hrs

INSTRUCTIONS
1. **Answer any five (05) questions only.**
2. **All questions carry equal marks.**
3. **Write your registration number /Index Number clearly on your answer script.**

1 (i) What are the functions that come under the scope of operations management? Discuss them in relation to your workplace.

(ii) An organization with sound operations management practices has to pay attention to the following competitive dimensions.

a) Cost b) Quality c) Speed
d) Reliability e) Flexibility

Describe these dimensions explaining as how each of them bring in competitive advantages to an organization.

(iii) Describe the following terms,

a) Production system
b) Production function
c) Capacity management
d) Productivity

2. (i) "Facilities layout has to be set up according to the type of production in order to achieve higher operational efficiency". Explain the validity of the above statement referring to three types of production processes known to you.

(ii) What are the major factors that have to be considered in designing a layout for a batch type manufacturing process?

(iii) ABC Furniture Company has the following five (5) sections in its manufacturing plant.

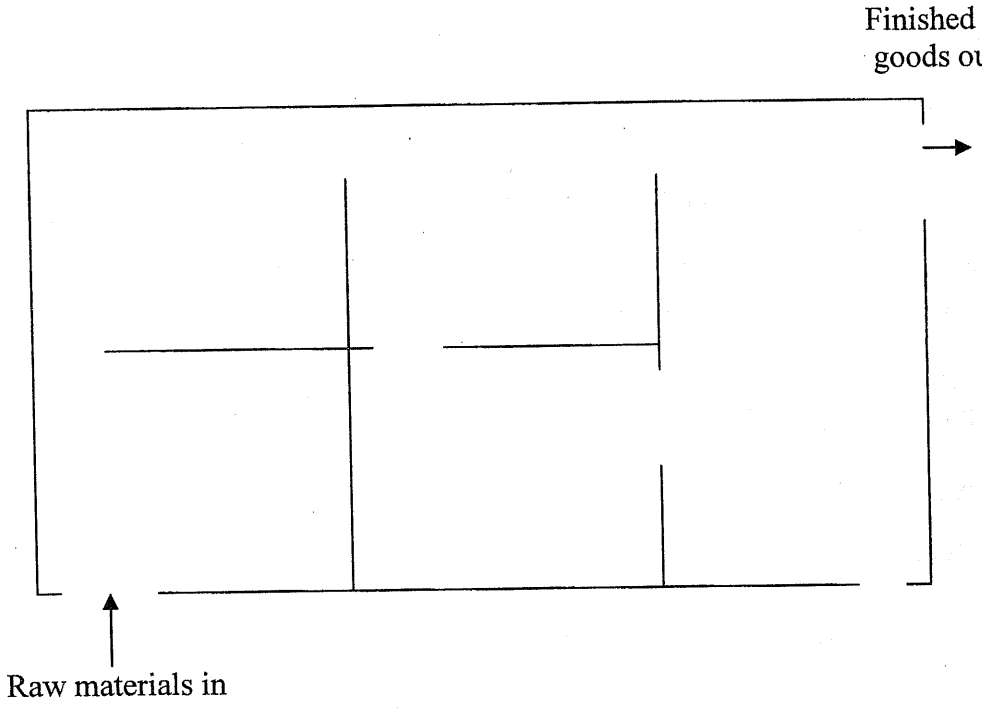
a) Cutting & Sizing b) Machining c) Assembling
d) Painting e) Finishing & Packing

The movement of loads of raw materials and work-in-progress between the five sections per month is as given in the following chart.

From \ To	Section				
	a	b	c	d	e
a	-	110	20	-	-
b	-	-	90	-	-
c	-	20	-	80	10
d	-	-	-	-	100
e	-	-	10	20	-

4.

The following building is available for locating the floor space for the above five sections.



5.

I. Allocate locations for five sections to facilitate the movements of loads between sections.

II. Draw pathways for the movement of people, trolleys and other materials handling equipment.

3. (i) How work study could be applied as a measure to improve the productivity of a service organization? Explain in relation to an establishment known to you.

(ii) What is the purpose of method study? Explain the six basic steps that have to be followed in carrying out a method study.

(iii) Define time study. What are the time allowances that have to be added to basic time in setting standard time for a studied job element of a process?

(iv) What is ergonomics? Explain as how you should design a work station for a cashier in a bank or a worker in an assembly line.

4. (i) Explain the purpose of inventory control and the cost involved in the management of inventory.

(ii) Describe two types of inventory control models available for determining economic order quantity and frequency of ordering that will minimize the costs.

(iii) A factory producing 24,000 refrigerators per year, place orders for importing the same amount of compressors from an overseas supplier. The fixed cost of placing an order is Rs. 14,000/-. The stock holding cost is Rs.80/- per unit per year. Calculate the economic order quantity and the frequency of ordering.

Determine the average yearly cost if one compressor costs Rs. 4,500/-.

The supplier gives 7.5% discount if the order quantity exceeds 3000 units. What is the best order quantity under this situation based on average yearly cost.

5. (i) Describe two kinds of scheduling techniques that can be applied in project planning and activity scheduling of manufacturing processes.

(ii) Describe the following terms,

a) Earliest start time
b) Latest finish time
c) Free float
d) Critical path

(iii) The following table shows the relationship between the activities of a construction project.

Activity	Preceding Activity	Completion time(days)
A	-	7
B	-	9
C	-	5
D	A	11
E	A	5
F	B	4
G	C	8
H	D	10
I	E	14
J	F, G	11
K	I, J	5
L	H, K	6

a) Construct the network diagram for the project clearly labeling events and activities.

b) Find out Earliest event time and Latest event time for all events and mark on the network diagram.

c) Identify the critical path and evaluate the total time needed for the project.

6. (i) "Efficiency and long-term sustainability of a manufacturing firm largely depends on its ability to plan capacity, output and inventory according to the market demand". Discuss the validity of the above statement.

(ii) Describe three(03) methods available for demand forecasting.

(iii) What is the best method of forecasting under each of the following yearly demand situations?

a) Demand gradually increases over the 12 months of the year.

b) Demand is highly seasonal and fluctuates in the12 months of the year.

(iv) The following table gives the sales of television units of a company for a period of one year.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sales	2900	2500	4000	3200	2400	2800	2600	2800	3100	2500	2700	3600

a) Compute 4 months moving average demand for the period from May to December.

b) Compute the demand using exponential smoothing method for the period from June to December for a smoothing constant of 0.25.

7. (i) Describe quality inspection procedures that are carried out in three stages in a manufacturing process in order to ensure the quality standards of the final product output.

(ii) What are the four (04) cost categories that should be borne by a manufacturer or a service provider in maintaining a quality assurance system?

(iii) Describe two statistical quality control procedures widely used in industry to validate quality standards of materials, processes and finished goods.

(iv) A sample of size 25 is drawn from a lot of incoming sub-assemblies received to a factory store. If the acceptable number of defectives is 2 or less, and the actual percentage of defectives in the lot is 12%, find the probability of finding 2 or less defectives.

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