

MANAGEMENT PROGRAMME

Term-End Examination

December, 2010

MS-5 : MANAGEMENT OF MACHINES AND MATERIALS

Time : 3 hours

Maximum Marks : 100

(Weightage 70%)

*Note : Section - A has five questions that carry 20 marks each.
Attempt any three questions from this section.
Section - B is compulsory and carries 40 marks.*

SECTION - A

1. (a) Why is it important that managers understand the relationship between the various stages of a product's life cycle and the different types of processes that are available for manufacturing that product?
(b) What are the different ways in which technology can impact an operation? Use examples in both manufacturing and service operations. 10+10

2. (a) What are some of the location factors that a manufacturer needs to take into consideration in locating a factory?

(b) A Small producer of machine tools wants to move to a larger building. Two alternatives have been identified. Location A has annual fixed costs of Rs 800,000 and variable costs of Rs 14000 per unit ; location B has annual fixed costs of Rs 920000 and variable costs of Rs 13000 per unit. The finished items sell for Rs 17000 each.

- (i) At what volume of output would the two location have the same total cost?
- (ii) For what range of output would location A be superior ? For what range would B be superior ?

10+10

3. (a) What are the major differences between work measurement and work sampling? What are the objectives in each case?

(b) The Finnish Creamery Company produces ice cream bars for vending machines and has an annual demand for 72,000 bars. The company has the capacity to produce 400 bars per day. It takes only a few minutes to adjust the production set up (cost estimated at Rs 75.00 per set up) for the bars, and the firm is reluctant to produce too many at one time because the storage cost (refrigeration) is relatively high at Rs 15.00 per bar-year. The firm supplies vending machines with its "Finn-Barrs" on 360 days of the year.

- (i) What is the most economical number of bars to produce during any one production run?
- (ii) What is the optimal length of the production run in days? **10+10**
4. (a) There is a current trend to reduce inventories. How is this being accomplished and what is the impact of lower inventories to the firm, its suppliers, and its customers?
- (b) As a time-study analyst, you have observed that a worker has produced 40 parts in a one-hour period. From your experience, you rate the worker as performing slightly faster than 100 percent so you estimate performance as 110 percent. The company allows 15 percent of job time for fatigue and delay.
- (i) What is the normal time?
- (ii) What is the standard time? **10+10**
5. (a) What is FMS? What is the general field of FMS application? Is the field of FMS application significant in terms of the potential market size for its capability? State with reference to any production unit.

(b) The times required to complete each of eight jobs on two machines are shown in the table that follows. Each job must follow the same sequence, beginning with machine A, and moving to machine B.

- (i) Determine a sequence that will minimize makespan time.
- (ii) Construct a chart of the resulting sequence, and find machine B's idle time.

10+10

Job	Time (hours)	
	Machine A	Machine B
A	16	5
B	3	13
C	9	6
D	8	7
E	2	14
F	12	4
G	18	14
H	20	11

SECTION - B

6. The R & D Department is planning to bid on a large project for the development of a new communication system for commercial planes. The accompanying table shows the activities, times, and sequences required.

Activity	Immediate Predecessor	Time (weeks)
A	-	3
B	A	2
C	A	4
D	A	4
E	B	6
F	C, D	6
G	F	2
H	D	3
I	E, G, H	3

- (a) Draw the network diagram.
- (b) What is the critical path?
- (c) Suppose you want to shorten the completion time as much as possible, and have the option of shortening any or all of B, C, D, and G each two weeks. Which would you shorten?
- (d) What is the new critical path and earliest completion time ? 4x5=20

7. Write short notes on *any four* of the following:

4x5=20

- (a) Taxonomy of waste.
 - (b) Job enrichment.
 - (c) Cost of quality.
 - (d) CRAFT.
 - (e) Robotics.
 - (f) Buffer stock.
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