

MANAGEMENT PROGRAMME

Term-End Examination

June, 2012

03070

**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.
Answer any three questions from question A. Section B
is compulsory and carries 40 marks.*

SECTION-A

10+10

1. (a) Why is R and D a key factor in productivity improvement ? Name some ways R and D contributes to productivity improvements.
- (b) A manufacturing firm has three proposals for a product. Either it can be purchased from an outside vendor at Rs. 4.00 per unit or it can be manufactured in-plant. There are two alternatives for in-plant manufacturing. Either, a fully automatic unit is procured, involving fixed cost of Rs. 30,000/ and variable cost of Rs. 2.75 per unit. Alternatively, a semi-automatic unit would cost Rs. 20,000/ as fixed cost and Rs. 3.00 per unit as variable cost.

2. (a) Draw a break-even chart for these alternatives. Suggest range of production-volume suited for these alternatives. **10+10**

(i) Describe value analysis. Why is purchasing department sometimes helpful in value analysis programmes ?

(ii) Should the supplier with the highest quality - lowest price combination always be selected over others ? Explain.

(b) A company produces 4800 parts per day and sells them at approximately half of that rate. The set-up cost is Rs. 1000 and carrying cost is Rs 5 per unit. The annual demand is 4,80,000 units.

Find :

(i) Optimal lot size.

(ii) Number of production runs that should be scheduled per year.

(iii) Length of each production run.

3. (a) (i) Give some reasons why methods analysis are needed. **10+10**

(ii) If an average worker could be identified, what advantage would there be in using that person for a time study ? What are some reasons why an average worker might not be studied ?

- (b) What is buffer stock ? List the reasons for keeping a buffer stock. Suppose the lead time for procurement of a product gets doubled. Will you recommend doubling its buffer stock ? Justify your answer.
4. (a) Assume that an airline, a hotel, and a hospital have chosen quality for differentiation. Identify, two or more measures of quality for a firm in each of these industries. **10+10**
- (b) A time study of an assembly operation yielded the following observed times for one element of the job, for which the analyst gave the performance rating of 1.13. Using an allowance of 20 percent, determine the appropriate standard time for this operation.

Observation <i>l</i>	1	2	3	4	5	6	7	8	9
Time <i>x</i> (minutes)	1.12	1.15	1.16	1.12	1.15	1.18	1.14	1.14	1.19

5. (a) Describe the 'Integrated concept of material management' and state how it is important in managing a big manufacturing company.
- (b) Processing time (in minute) of six jobs on two machines are given below. All six jobs must go through M_1 and M_2 in that sequence M_1 first, then M_2 . Determine the optimal order in which the jobs should be sequenced through the using these times. **10+10**

Job	J1	J2	J3	J4	J5	J6
Machine M_1	4	6	7	8	9	1
Machine M_2	5	8	1	3	6	10

SECTION-B

6. The R and 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 sequence required. 20

Activity	Immediate Predecessors.	Estimated Duration (days)
A	-	9
B	-	9
C	-	10
D	A	4
E	B	7
F	C	3
G	D, E, F	8
H	C	7
I	G, H	0

- (a) Draw the network diagram
- (b) Find the critical path
- (c) Find the project completion time
- (d) Calculate the total float for each of the activities.

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

- (a) Zero technology 5×4=20
 - (b) Cost of quality
 - (c) VED analysis
 - (d) Preventive maintenance
 - (e) CRAFT
 - (f) CAD/CAM
 - (g) LIFO system
 - (h) Producer's risk.
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