

# MTP\_Intermediate\_Syllabus 2012\_Dec2013\_Set 2

## Paper 9 - Operations Management and Information Systems

### Section –A

[Question 1 is compulsory and ay 4 from the rest]

#### 1. Answer any 6 questions of the following:

- (a) The demand for sewing machine was estimated as 1000 per month for 5 months. Later on the actual demand was found as 900, 1050, 1100 and 950, respectively. Calculate the MAD and Bias.
- (b) Discuss the Input/ Output Control.
- (c) Define Quality Function and Development (QFD)
- (d) A work study practitioner who conducted a work sampling study assesses the activity level of worker to be 70%. During the space of 8 hours working, this worker turns out 320 components. If the company policy is to inflate the normal time arrived at by work sampling study by 20% , what should be the allowed time per unit ?
- (e) State the applications of Programme Evaluation and Review Technique (PERT)
- (f) Discuss about the Total Float.
- (g) Monthly demand for a component 1,000 units. Setting –up cost per batch ₹ 120. Cost of manufacture per unit ₹ 20. Rate of interest 10% P.a. Calculate the EBQ. Mentioning the Five principles of TQM. **[6x2=12]**

- 2 (a) The output of a production line is checked by an inspector for one or more of three different types of defects, called defect A, B and C. If defect A occurs, the item is scrapped. If defect B or C occurs, the item must be reworked. The time required to rework of B defect is 15 minutes and the time required to rework of C defect is 30 minutes. The probabilities of an A, B and C defects are 0.15, 0.20 and 0.10 respectively. For ten items coming of the assembly line, Determine the number of items without any defects, the number scrapped and the total minutes of rework time. Use the following random numbers:

RN for defect A	48	55	91	40	93	01	83	63	47	52
RN for defect B	47	36	57	04	79	55	10	13	57	09
RN for defect C	82	96	18	96	20	84	56	11	52	03

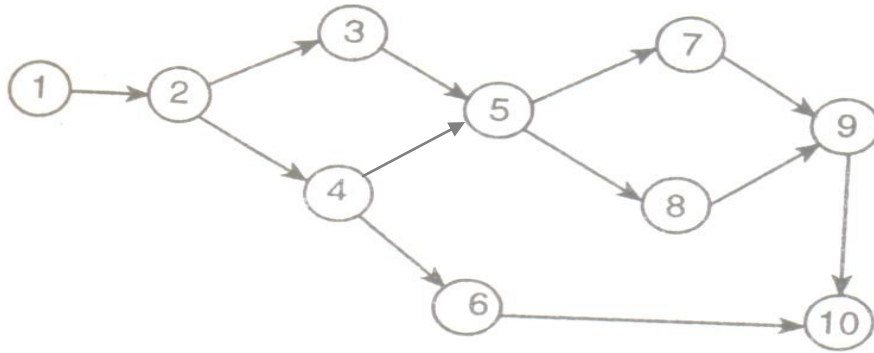
- (b) Discuss the objectives of the Material Requirement Planning.

- (c) State the Cycle Time in the Line Balancing.

**[6+4+2]**

- 3(a) Various activities of small project and other relevant information have been shown in the adjoining table:

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Activity	Most optimistic time (in days) (a)	Most likely time ( in days) (m)	Most pessimistic time (in days). (b)
1 – 2	4	8	12
2 – 3	1	4	7
2 - 4	8	12	16
3 – 5	3	5	7
4 - 5	0	0	0
4 – 6	3	6	9
5 – 7	3	6	9
5 - 8	4	6	8
7 – 9	4	8	12
8 – 9	2	5	8
9 – 10	4	10	16
6 – 10	4	6	8

Using the given information, and the resulting network shown in the above Fig:  
Determine the following:

- (i) Expected task times and their variance.
- (ii) The critical path.
- (iii) Variance of Critical Path.

**(b)** Explain the Prohibited Route.

**[10+2]**

**4 (a)** A firm owns facilities at six places. It has manufacturing plants at places A, B and C with daily production of 50, 40, and 60 units respectively. At point D, E, and F it has three warehouses with daily demands of 20, 95, and 35 units respectively. Per unit shipping costs are given in the following table. If the firm wants to minimize its total transportation cost, how should it route its products by using its LCM?

		Warehouse		
		D	E	F
Plant	A	6	4	1
	B	3	8	7
	C	4	4	2

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- (b) "A flexible manufacturing system (FMS) is a configuration of a group of production machines (or workstations) connected by automated material handling and transferring machines and integrated by computer system which can give instructions to produce hundreds of different parts in whatever order specified." – Explain the statement with the reference of components, advantages and disadvantages of that system.

[7+5]

- 5 (a) The demand curve faced by a firm is  $p = 20 - 4x$  and the cost function is  $C = 4x$  (where  $p$  = price,  $x$  = output, and  $C$  = total cost).

(i) Determine the optimum level of output, price and maximum profit if the objective of the firm is to maximize profit.

(ii) What will be the new price if a unit tax of ₹ 0.50 is imposed?

(iii) Determine the rate of unit tax so that tax revenue is maximum.

- (b) The demand function for neckties is given as  $q = 100 - \frac{1}{3}p$ . Calculate the elasticity of demand ( $e_d$ ) at a price of 240.

[10+2]

- 6(a) The Mini Transport Company owns three mini buses, two of which are two years old while the third one is only a year old. Each of these buses was purchased for ₹ 80,000. The company contemplates replacing the three buses by two full-sized buses, each such bus containing 50% more seating capacity than a mini bus. Cost of each is ₹ 1,20,000. Using the following data on the running costs and the resale value of both the types of buses, state whether the mini buses be replaced by the full-sized buses. If not, state why? If yes, state when?

Year	For a Mini Bus		For a Full – sized Bus	
	Running Cost	Resale Value	Running Cost	Resale Value
1	3,000	70,000	3,400	1,00,000
2	3,600	61,000	3,900	92,000
3	4,800	55,000	4,700	86,000
4	5,000	49,000	5,800	81,000
5	8,000	32,000	7,200	76,000
6	11,200	20,000	9,000	66,000
7	15,000	10,000	12,000	54,000
8	20,000	5,000	16,000	40,000

- (b) Discuss the benefits of Material Planning.

[10+2]

## Section B

Question no. 7 is compulsory and answer any four from the rest

7. Answer the following

[4 x 2 = 8]

- (a) What do you understand by Business Process Reengineering (BPR)?

- (b) Write short notes on “Executive Information System” (EIS).
- (c) Explain the importance of data dictionary in software development process.
- (d) Distinguish between Logical Design and Physical Design.
8. What are the activities involved in System Development phase? **[8]**
9. (a) What are the reasons of failure to achieve system Development Objectives? **[4]**  
(b) Explain the methodology of System Development. **[4]**
10. What are the factors on which information requirement depends? **[8]**
11. (a) What are the Characteristics of a good ERP System? **[4]**  
(b) Explain the guidelines for ERP Implementation. **[4]**
12. (a) What are the functions of Controller under Information Technology Act? **[4]**  
(b) Who can make application for Digital Signature Certificate? **[4]**