

## **2007 SBM OPERATIONS MANAGEMENT- TEST I**

Time: 50 minutes

Marks: 2+2+2+2+4+2+4+2=20, Max 15

1. What are the common operations objectives? Explain with examples.
2. Explain the various steps in new product design and development.
3. A factory manager is considering two options of serving tea to workers: A) An automatic tea vending machine costing Rs20,000/- with the variable cost of making one cup of tea Rs1.50. B) Manual preparation with equipment costing Rs1000/- but variable cost Rs2.00 per cup. Determine the minimum number of cups to be consumed for the automatic vending machine to be economic.
4. Explain the concept of "moment of truth" and its importance in the service delivery process.
5. The number of telephone calls made from a telephone for last five months are:

Month	Jan	Feb	Mar	Apr	May
No of calls	746	680	781	900	799

Predict the number of calls for June using a) Exponential smoothing method assuming initial forecast to be 700 and smoothing factor 0.2. b) Linear regression assuming a time series.

6. A supermarket needs to be laid out in a new building with plan as below.

		Cash & Security

The Cash and Security area has to be near the entrance and its location is fixed. The relationship between departments has been established as follows:

	Grocery	Stationery	Frozen foods	Vegetables	Toiletry	Cash & Security
Grocery	-	U	U	U	X	U
Stationery		-	U	U	I	A
Frozen foods			-	E	O	U
Vegetables				-	U	U
Toiletry					-	I
Cash & Security						-

Arrange the various departments in a suitable plan.

7. Bobby Umbrellas needs to design a line to manufacture umbrellas. Assign the following work elements to workstations, if the desired output is 100Nos in an 8 hour day.

Task	Description	Time (s)	Predecessor
A	Fix upper spring in stem	20	-
B	Fix spoke on stem	90	-
C	Fix ribs on spoke	150	B
D	Fix stop on stem	30	A
E	Fix lower spring in stem	25	-
F	Fix button on stem	35	E
G	Keep cloth and tighten endcap	50	C, D
H	Stitch cloth to ribs	120	G
I	Fix handle	70	C, F
J	Test opening and closing	40	H, I

8. Explain how standard times are determined using the predetermined data method.

**SOLUTIONS:**

3.  $19000/0.5=38000$

5.

Month	1	2	3	4	5	6
Actual	746	680	781	900	799	
Forecast	700	709.2	703.36	718.888	755.1104	<b>763.8883</b>

Regression

Slope	32.6
Intercept	683.4
Prediction	<b>879</b>

6.

Grocery	Stationery	Cash & Security
Frozen foods	Vegetables	Toiletry

7. Cycle Time =  $8*3600/100 = 288s$

Theoretical Minimum no of Workstations =  $630/288 = 2.1875 = 3$

Workstation	Startable tasks	Possible tasks	Selected task	Task Time	Idle Time
1	A, B, E	A, B, E	B	90	198
	A, E, C	A, E, C	C	150	48
	A, E,	A, E	E	25	23
2	A, F	A, F	F	35	253
	A, I	A, I	I	70	183
	A	A	A	20	163
	D	D	D	30	133
3	G	G	G	50	83
	H	H	H	120	168
	J	J	J	40	128