

## **2007 SBM OPERATIONS MANAGEMENT SUPPLEMENTARY**

Time: 180 minutes

Max marks: 50

1. Consider a Bank as an Operations Transformation System and identify the inputs, outputs and important processes. (2 marks)
2. Explain the variation of net profit during the product life cycle. (2 marks)
3. What do you mean by "robust design"? Explain. (2 marks)
4. A soap manufacturing factory requires an investment of Rs1,00,000/-. If soaps can be sold at a price of Rs10/- and the variable cost is Rs5/-, determine the quantity of units that have to be sold for the factory to break even? (2marks)
5. Design a layout for a dispensary based on the following relationship matrix. The floor plan is given below. The position of Reception is fixed since it has to be near the entrance. (2 marks)

	Doctor	Nurse room	Pharmacy	Casualty	Store
Reception	I	I	I	E	X
Doctor	-	O	O	A	U
Nurse room	-	-	O	E	U
Pharmacy	-	-	-	O	I
Casualty	-	-	-	-	U
Store	-	-	-	-	-

PLAN:

Reception		

(3 marks)

6. Vijat Appliances make electric irons. Design a line to assemble irons, if the desired output is 250Nos in a 6 hour day. The following are the work elements to be assigned to workstations. (4 marks)

Task	Description	Time (s)	Predecessor
A	Place Soleplate on jig	10	-
B	Place coil on Soleplate	20	A
C	Place Top plate over coil and tighten	50	B
D	Fix leads to coil	40	-
E	Fix Top Cover on plate	35	C
F	Fix handle on top cover	45	-
G	Fix cord	25	D
H	Fix plug to cord	15	-
I	Test Iron	30	E, G, H

(4 marks)

7. The demand of toilet soaps at a stationery shop for the last five weeks is 150, 155, 162, 152, 157. Predict the demand for the next week using exponential smoothing with a factor of 0.1. The initial forecast may be chosen as 152. (3 marks)
8. A hospital has 50 beds, but 10 are in damaged condition. Today, there are 40 patients, what is the design capacity utilisation and effective capacity utilization? (2 marks)
9. Explain what do you mean by aggregate planning. (2 marks)

10. At 17:00hrs, student has to do five jobs as listed below. Determine the sequence according to SPT rule, and the average WIP.

Job	Time required (min)
A: Study Operations Management	30
B: Write Maths assignment	20
C: Make phone call to home	10
D: Clean room	40
E: Wash clothes	70

(3 marks)

11. Explain the concept of input output control in a job shop.

(2 marks)

12. The major activities and precedence relationships to organize an excursion are as follows:

	Activity	Predecessor	Time (days)
A	Decide places of visit	-	3
B	Intimate students	A	3
C	Obtain advance from students	B	5
D	Enquire reservation availability	-	2
E	Book Rail tickets	C, D	3
F	Enquire accommodation availability	-	2
G	Book Hotel	C, F	4
H	Give travel plan to students	E, G	3

Draw the network diagram and determine in how many days at the earliest can the excursion start.

(2 marks)

13. What are the various inventory costs? Explain.

(2 marks)

14. Carry out an ABC classification of the following items at a dispensary pharmacy.

Item	Unit cost (Rs)	Annual usage
Paracetamol	0.50/No	1000Nos
Dettol	100/litre	20 litres
Bandaaid	1.00/No	3000Nos
Surgical Cotton	150/kg	5kg
Antibiotic tablets	5.00/no	10,000Nos
Antihistamine	0.80/No	2000Nos
Cough Mixtures	300/litre	10 litres
Vitamin tablets	1.50/No	5000Nos
Phenyle	50/litre	100 litres
Razor Blade	3/No	50Nos

(5 marks)

15. A medicine bottle consists of a bottle and cap crimped together. 1000 bottles are to be filled in Week 4 and 2000 in Week 6. The filling takes two weeks and hence caps should be made available two weeks ahead. The lead time for cap is two weeks with FOQ 3000 and initial inventory 1000. How many caps should be ordered and when? What will be the inventory of caps in Week 6?

(2 marks)

16. What do you mean by stabilising master schedule in JIT?

(2 marks)

17. Discuss "Job Design".

(2 marks)

18. Explain the three factors which make an "Enthusiastic Employee"

(2 marks)

19. Why are managements generally reluctant to use incentive plans? (2 marks)
20. Who was Joseph M Juran? Discuss his contributions to quality management. (2 marks)
21. List at least six of Deming's points for transformation of management. (2 marks)
22. What are the various steps for an organization to get ISO9001 certification? (2 marks)
23. Why should organizations improve? (2 marks)
24. The attendance of a student and the marks scored by him in a subject are given below. Draw a Scatter diagram and give your conclusions.

Attendance	Marks
42	17
48	20
49	18.5
46	41
45	10
53	33.5
56	42.5
36	13
33	17.5
41	20
54	44
59	48.5
35	20.5

25. What is the meaning of the statement "A process is in control"? (5 marks)
- (2 marks)

**SOLUTIONS TO NUMERICALS:**

4. Break Even Quantity =  $100000 / (10 - 5) = 20000$  Nos

5.

Reception	Casualty	Nurse Room
Pharmacy	Doctor	Store

6. Cycle Time =  $6 * 3600 / 250 = 86.4$ s

Theoretical Minimum no of Workstations =  $270 / 86.4 = 3.125 = 4$

Workstation	Startable tasks	Possible tasks	Selected task	Task Time	Idle Time
1	A, D, F, H	A, D, F, H	F	45	41.4
	A, D, H	A, D, H	D	40	1.4
2	A, H, G	A, H, G	G	25	61.4
	A, H	A, H	H	15	46.4
	A	A	A	10	36.4
	B	B	B	20	16.4
3	C	C	C	50	36.4
	E	E	E	35	1.4
4	I	I	I	30	56.4

7. Forecasts: 152, 151.8, 152.12, 153.108, 152.9972, 153.39748

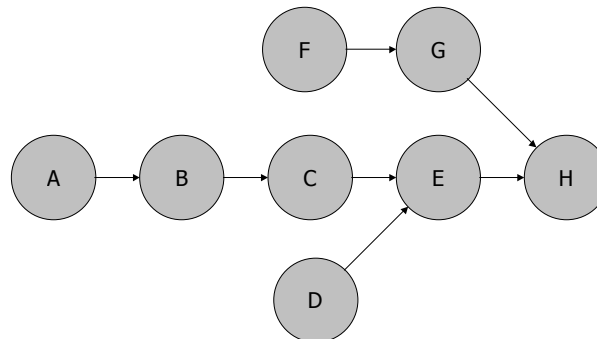
8. Design capacity utilisation =  $40 / 50 = 80\%$ , Effective capacity utilisation =  $40 / 40 = 100\%$

10.

Job	Time required (min)	Completion Time (min)	Flow Time (min)
C	10	10	10
B	20	30	30
A	30	60	60
D	40	100	100
E	70	170	170

WIP =  $370 / 170 = 2.176$

12.



FGH = 9 days, ABCEH = 17 days, DEH = 8 days, hence 17 days.

13.

	Unit Cost	Annual Usage	Value	Percentage total	Category
Antibiotic tablets	5	10000	50000	73.15289	A
Vitamin tablets	1.5	5000	7500	10.97293	A
Bandaid	1	3000	3000	4.389173	B
Cough Mixtures	300	10	3000	4.389173	B
Dettol	100	20	2000	2.926116	C
Antihistamine	0.8	2000	1600	2.340892	C
Surgical Cotton	150	5	750	1.097293	C
Paracetamol	0.5	1000	500	0.731529	C
		Total	68350		

14.

<b>Item:</b> Handle	<b>Lot size:</b> FOQ 3000							
	<b>Lead Time:</b> 2 weeks							
	Week							
	1	2	3	4	5	6	7	8
Gross requirements		1000		2000				
Scheduled receipts								
Projected on-hand inventory (Beg: 1000)	1000	0	0	3000		0		
Planned receipts				3000				
Planned Order release		3000						

23.

