

# Small Business Management

## Subject: **Operations Management**

Duration: 3 Hours

Maximum Marks: 50

Note: Answer Part A and Part B in separate answer books.

### **PART - A**

5 X 7 = 35 Marks

Answer any five questions.

All the questions carry equal marks.

1. (a) For each of the following systems, which type of layout, would you suggest? State the reasons.
- (i) A blood donation center
  - (ii) A building construction site
  - (iii) A self-service cafeteria

- (b) In a candy factory, a time study was made of the chocolate melting and pouring operation. Two inexperienced industrial engineers and one experienced industrial engineer made the study simultaneously. They agreed precisely on cycle times shown below, but varies on rating the worker.

Observation	1	2	3	4	5	6	7	8	9	10
Cycle time (minutes)	2.30	1.80	2.00	2.20	1.90	2.00	1.90	2.10	2.20	2.30

The experienced engineer rated the worker 100% and the other engineers rated the worker 80% and 110 %. The Firm uses an allowance of 15% of normal time.

- (i) Determine the standard time using the experienced engineers worker rating.
  - (ii) Determine the standard times using the worker rating of each inexperienced engineer.
  - (iii) Are you sure the experienced engineer is correct in rating the worker?
  - (iv) What could be done to enhance consistency in the performance ratings made by the engineers?
2. (a) Suppose a directive goes to a manufacturing factory from the controller strongly suggesting a 35 percent across the board reduction in inventory levels. The plant manager asks you to help explain the need for inventories in manufacturing. What points would you make in favour of inventories?
- (b) An ice cream parlour experiences the following demand for ice cream:

Day	:	April 11	April 12	April 13	April 14	April 15	April 16
Demand	:	650	680	640	700	690	675

(cases)

- (i) Using a simple average, what would be the forecast for April 17th?
- (ii) Using a three period moving average, what would be the forecast for April 17th?

3. (a) A Consultant making a methods - improvement study has identified a problem and developed a written description of the present method of doing the job. What kinds questions would be most useful for analysing the problem?

(b) A bicycle repairman has the following repair jobs. The current time is 10.00 AM

Job in the order of arrival	Estimated time to complete repair (Hours)	Completion time promised to customer
A	2.0	11.00 AM
B	1.5	4.00 PM
C	0.5	4.00 PM
D	-1.5	6.00 PM
E	2.5	1.00 PM

Determine the sequence for the jobs, the number of jobs completed and the amount by which each late job will be late for the following scheduling rules:

- (i) First Come First Served .
- (ii) Shortest Processing Time
- (iii) Earliest Due Date

4.

A Scissors Company makes a basic scissors which consists of three parts: the left side, the right side and the screw which holds the sides together. At the present time, the company has the following numbers of parts on hand and on order. The lead times for reorder of each part are also shown.

	Inventory on Hand	Lead. Time (Weeks)	Scheduled Receipts
Scissors	100	1	-
Left side	50	2	100 in week 2
Right side	75	2	200 in week 2
Screw	300	1	200 in week 1

Assume that the master schedule calls for 300 scissors to be shipped in Week 4 and 400 in Week 5. Work out complete materials plan.

- 5. (a) Contrast the plant location problems of a Manufacturing firm and a Supermarket, showing the relevant considerations they share and those they don not.
- (b) Draw an outline process chart for a soft drink manufacturing process.
- 6. (a) What are the basis decisions to be made in inventory control? Explain.
- (b) Distinguish between ABC and VED analysis.  
How does the ABC analysis help in inventory control?

7. Write short notes on any two of the following.
- (a) Incentive schemes for a small manufacturing firm.
  - (b) Casual forecasting
  - (c) Production cycle.

PART - B

**QUALITY MANAGEMENT**

. Max.marks: 15

Answer any two questions out of three.

1. (a) Discuss the various definitions of quality. (2 1/2 marks)8 (2
- (b) Describe the sequence of steps to implement ISO 9001 in an organisation. (2 1/2. marks)
- (c) How will you carry out a structured brain storming session? . '. (2 1/2-marks)

2. Cement bags are weighed and sealed by a semiautomatic machine. Every hour, five bags were weighed in a reliable balance as a crosscheck and the results recorded. The readings for 20 hours are given below.

Hour	Bag1	Bag2	Bag3	Bag4	Bag5
1	54	56	56	56	55
2	51	52	54	56	49
3	54	52	50	57	55
4	56	55	56	53	50
5	53	54	57	56	52
6	53	47	56	55	54
7	52	55	54	55	56
8	56	53	53	54	55
9	55	52	53	56	55
10	50	54	53	55	55

11	57	54	53	52	53
12	52	52	54	53	55
13	54	53	55	52	52
14	54	55	54	53	55
15	56	53	57	56	54
16	58	57	56	54	54
17	55	55	55	56	53
18	54	57	54	55	54
19	54	53	56	- 53 -	55
20	53	53	57	54	53

Determine the control limits for an average and range chart from the above values. Identify the points, if any, out of control.

( $A_2=0.577$ ,  $D_3= 0$ ,  $D_4 = 2.115$ )

- 3 (a) The details of scrap for six months in a valve manufacturing company are as follows: **J**

Face Cracks	132
Stem Cracks	69
Blow holes	207
Pin holes	677
Stem dia less	432
Head dia less	136
Overall length less -	57
Seat height less	318

Draw a Pareto diagram and identify the most important reasons for scrap, which account for at least 50% of the total scrap.

(5 marks)

- (b) Sketch shapes of the following types of histogram.

- (i) Normal distribution
- (ii) Skewed distribution
- (iii) Cliff like distribution
- (iv) Outlying islands
- (v) Comb-like distribution