POKHARA UNIVERSITY

Level: Bachelor | Semester: Spring | Year: 2021
Programme: BBA/BI/TT/BCIS | Full Marks: 100
Course: Fundamentals of Operations Management | Pass Marks: 45
Time: 3 hrs.

Candidates are required to answer in their own words as far as practicable. The figures in the margin indicate full marks.

Section "A"

Very Short Answer Questions

Attempt all the questions. [10×2]

1. What do you understand by the transformation process? Explain.
2. Mention the inventory models for independent demand and define any one of them.
3. How do companies compete with 'Response' Strategy? Explain any two in brief.
4. Define Quality Function Deployment (QFD).
5. What is inventory buffer?
6. What are the costs of quality? Define.
7. What is vertical integration in supply chain management?
8. How Johnson's rule differ from assignment method?
9. Chip Gillkin's company wants to establish kanbans to feed a newly established work cell. The following data have been provided. How many kanbans are needed?

Daily demand	250 units
Productions lead time	½ day
Safety stock	¼ day
Kanban size	**50 units**

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10. Mention all the criteria for vendor selection.

Section "B"

Descriptive Answer Questions

Attempt **any six** questions. [6×10]

11. Distinguish between the product design and service design. Describe about different stages of product development processes.
12. Define operations management. Explain the major changing operations environment you have observed, in the context of global pandemic situation due to COVID-19.

13. Five jobs have to be processed with two workstations cutting and drilling shown as follows:

Jobs	Cutting (hr.)	Drilling (hr.)
A	9	6
B	7	10
C	12	8
D	14	11
E	11	16

You are required to prepare the optimal plan schedule. Also calculate:

a) Total completion time
b) Total Job waiting time
c) Total machine idle time

14. Shampoo manufacturing company wants that the contents of a bottle should measure 100 ±1mls net. A statistical quality control operations is established and the following data are obtained:

Sample No.	Quantity mls					
1	100.4	101.6	102.4	100.3	101.4	100.5
2	102.3	99.8	101.8	99.6	100.2	101.5
3	100.6	99.5	99.6	100.5	99.8	99.2
4	100.3	99.4	100.5	99.8	101.0	99.8
5	101.5	101.0	104.0	102.0	102.5	105.0

From the table, for n=6, A2 = 0.483, D3 = 0, D4 = 2.004

a) Construct neat and suitable control charts of mean and range for these given data.
b) What points, if any, out of control?
c) Comment on your result.

15. A 'Cosmetic Store' procures and sells cosmetic goods. Data for an item are given below:

Expected sales per year = 4800 units
Ordering cost per year = Rs. 50 per order
Holding cost = 20 % of the inventory cost.
Working days per year = 300 days
Lead time = 3 days
Safety stock = 15 units

The normal cost of the item is @ Rs. 200 and the item can be bought according to any of the three prices and the price schedule is:

Lot size (units)	**Price Discount (in %)**
≤ 100	No Discount
101 to 200	10
above 200	20

Daily demand can be considered a constant value.

a) Determine the inventory policy that will yield a minimum total inventory cost.

b) Calculate re-order point.

c) Find out time between orders.

How supply chain performance is measured in an organization? Define outsourcing and explain its importances, risks and ethical issues for outsourcing.

Define the term ISO. Explain how implementation of JIT layout, JIT inventory, JIT scheduling and JIT quality leads to lean operations?

Section "C"

Case Analysis

Read the case situation given below and answer the questions that follow: [20]

Productivity Gains at Whirlpool

Workers and management at Whirlpool Appliances Benton Harbour plant in Michigan have set an example of How to achieve productivity gains, which has benefited not only the company and its stockholders but also Whirlpool customers and the workers themselves.

Things weren't always rosy at the plant. Productivity and quality weren't good. Neither were labour-management relations. Workers hid defective parts so management wouldn't find them, and when a machine broke down, workers would simply sit down until sooner or later someone came to fix it. All that changed in the late 1980s. Faced with the possibility that the plant would be shut down, management and labor worked together to find a way to keep the plant open. The way was to increase productivity – producing more without using more resources. Interestingly, the improvement in productivity didn't come by spending money on fancy machines. Rather, it was accompanied by placing more emphasis on quality. That was a shift from the old way, which emphasized volume, often at the expense of quality. To motivate workers, the company agreed to gain sharing, a plant that rewarded workers by increasing their pay for productivity increases.

The company overhauled the manufacturing process, and taught its workers how to improve quality. As quality improved, productivity went up because more of the output was good, and costs went down because of fewer defective parts that had to be scrapped or reworked. Costs of inventory also decreased because fewer spare parts were needed to replace defective output, both at the factory and for warranty repairs. And workers were able to see the connection between their efforts to improve quality and productivity, and pay.

Not only was Whirlpool able to use the productivity gains to increase

worker pay, it was also to hold the lid on price increases and to funnel some of the savings into research, which added to cost savings and Quality improvements.

Questions:

a) What were the key things that Whirlpool management did to achieve productivity gains?
[6]

b) In reference to the case, who has benefited from the productivity gains? Explain.
[6]

c) Regarding the case, how has productivity and quality been related? Explain
[7]