



UNIVERSITY OF RUHUNA
FACULTY OF MANAGEMENT AND FINANCE

No. of Pages : 05
No. of Questions: 06
Total Marks : 70

BBA 2201 – Operations Management

BACHELOR OF BUSINESS ADMINISTRATION DEGREE 2000 LEVEL

SECOND SEMESTER END EXAMINATION –MARCH/APRIL 2019

Three Hours

Instructions

➤ Answer only five (05) questions

22

Non programmable calculators are allowed

01.

- i. Explain how the concepts of capacity planning, aggregate planning, and material requirement planning could be applied to a manufacturing firm.

(06 marks)

- ii. Explain the importance of product design to achieve competitive advantages. Use an example from manufacturing industry to illustrate your answer.

(08 marks)

(Total 14 marks)

02.

ABC Company is setting up an assembly line to produce 192 units of products per 8- hour shift. The following table shows the work elements, immediate predecessors, and times:

| Work element | Immediate predecessors | Time (seconds) |
|--------------|------------------------|----------------|
| A | | 50 |
| B | A | 60 |
| C | B | 80 |
| D | B | 60 |
| E | B, G | 50 |
| F | C, D, E | 70 |
| G | A | 30 |
| H | F | 25 |

- i. Draw and label precedence diagram.
- ii. Compute cycle time.
- iii. Compute the theoretical minimum number of workstations.
- iv. Balance the assembly line.
- v. Calculate the efficiency of the assembly line.
- vi. How would you change the line to produce 240 units per 8- hour shift? Calculate its efficiency.

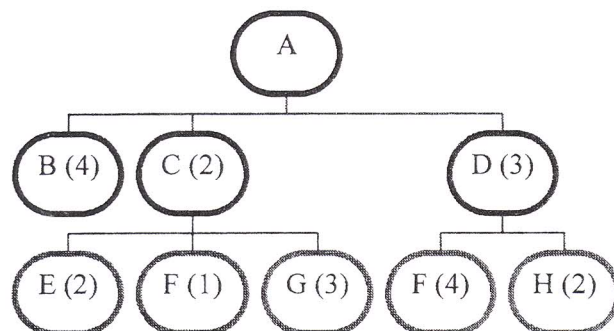
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04.

03.

- i. What are the basic types of layouts? How do they differ? Give an example for each.
- ii. Given the product structure of product A, lead time, and inventory status, you are required to develop a Material Requirement Plan (MRP) for the planning horizon of 10 periods assuming the requirement of product A in period 10 is 125 units.

Product structure



(The numbers within brackets represents quantities per assembly)

Lead time and inventory status

| Item | Lead time | On hand |
|------|-----------|---------|
| A | 2 | 25 |
| B | 2 | |
| C | 4 | 15 |
| D | 3 | |
| E | 2 | |
| F | 1 | 5 |
| G | 2 | |
| H | 3 | 40 |

(08 marks)

(Total 14 marks)

XYZ, a manufacturer of airtight vacuum bag to extend the freshness of fruits, uses aggregate planning to set labor and inventory levels for the year. While a variety of bags are produced, a standard airtight vacuum bag composed of basic supplies is used for planning purposes. The average worker at XYZ can produce 1500 standard bags a month at a cost of Rs.15 per bag during regular production hours and Rs.17 a bag during overtime production. Completed bag can also be purchased from outside suppliers at Rs.19 each. Inventory carrying costs are Rs.2.50 per bag per month. Overtime is limited to 15500 standard airtight vacuum bags, but subcontracting is unlimited. Due to high quality standards and extensive training, hiring and firing costs are Rs.7500 per worker. XYZ currently employs 25 workers. Demand forecast for the first six months is shown in table below.

| Month | Demand |
|----------|--------|
| January | 55500 |
| February | 49500 |
| March | 21000 |
| April | 45000 |
| May | 67500 |
| June | 19500 |

- i. Develop a six-month aggregate production plan for XYZ using;
 - a) Chase demand, and
 - b) A mixed strategy where the current workforce is kept for January through [unclear] supplemented with overtime and subcontracting as needed.
- ii. Compare the above two strategies by calculating cost of each strategy and determining the best strategy for the XYZ.

05.

- i. Imagine that you are the Operations Manager of a Jay- Jay Mills Garment factory in [unclear] District. Suggest strategies to develop job design for this organization concerning Herzberg's two attributes.
- ii. The Physical Education Unit of the University of Ruhuna wants to develop its budget for the next year using a forecast for football attendance. Football attendance accounts for a significant portion of its revenues and the athletic director believes attendance is directly related to the number of wins by them. The business manager has accumulated total annual attendance figures for the past eight years.

| Wins | Attendance |
|------|------------|
| 4 | 36300 |
| 6 | 40100 |
| 6 | 41200 |
| 8 | 53000 |
| 6 | 44000 |
| 7 | 45600 |
| 5 | 39000 |
| 7 | 47500 |

Given the number of returning starters and the strength of the schedule, the athletic director believes the team will win at least seven games next year.

Develop a simple regression equation for this data to forecast attendance for this level of success.

(08 marks)

(Total 14 marks)

06.

i. Define the concept of Lean Manufacturing.

(02 marks)

ii. "The cost of quality consists of cost of achieving good quality and cost of achieving bad quality." Explain this statement with examples.

(06 marks)

iii. Ceylon News Papers Company has three locations to deliver newspapers. The (X, Y) coordinates in miles for distribution centers and daily amount of suppliers are as follows.

| Location | Coordinates | | Daily requirement |
|----------|-------------|-----|-------------------|
| | X | Y | |
| A | 200 | 200 | 78000 |
| B | 250 | 600 | 56000 |
| C | 500 | 300 | 92000 |

Suppose Operations Manager has identified two possible sites as site1 (coordinates: 400,250), and site 2 (coordinates: 100,200). Determine the best site for deliver newspapers using the load distance technique.

(06 marks)

(Total 14 marks)
