University of Kelaniya - Sri Lanka

Centre for Distance and Continuing Education

Faculty of Commerce & Management Studies

Bachelor of Business Management (General) Degree Third Examination (External) – 2016

April/ May - 2022

BMGT E3045 – Operational Management

No of questions : 07 (Seven) Time: 03 Hours

Answer any **Five (05)** questions.

Question No. 01

a) "Operations Management is the process of planning, organizing and controlling the activities of operation function." Elaborate on this statement.

(10 marks)

b) Explain the various stages in the evolution of Operations Management.

(05 marks)

c) What are the three major business functions, and how are they related to one another?

(05 marks)

(Total 20 marks)

Question No. 02

Supun Furniture is a small furniture shop that focuses on making chairs. The weekly rupee's value of its output, including finished goods and work in progress, is Rs.1 428 000. The value of inputs, such as labor, materials, and capital, is approximately Rs.1 652 800.

(i) Compute the total productivity measure for Supun Furniture

(05 marks)

(ii) Supun has just purchased a new polishing machine that processes 17 chairs in 8 hours. What is the productivity of the polishing machine?

(05 marks)

(iii) Supun has hired two new workers to paint chairs. They have painted 10 chairs in 4 hours. What is their labor productivity?

(05 marks)

(iv) On average, Supun Furniture produces 25 chairs per day. Labor costs average Rs. 48 000, material costs are typically Rs.20 000, and overhead cost is Rs. 25 000. If Supun sells the chairs to a retailer for Rs.7 000 each, determine the multifactor productivity.

(05 marks)

(Total 20 marks)

Question No. 03

a) Explain why capacity planning is important to a business.

(05 marks)

b) What are decision trees, and how do they help us make better decisions?

(05 marks)

c) XYZ Software Development Company has determined that it needs to expand its current capacity. The decision has come down to whether to expand now with a large facility, incurring additional costs and taking the risk that the demand will not materialize, or to undertake a small expansion, knowing that the decision will have to be reconsidered in five years. A large facility will cost the company Rs. 1 000 000 while a small facility will cost Rs. 200 000.

Management has estimated the following chances for demand:

The likelihood of demand being high is 0.60.

The likelihood of demand being low is 0.40

Profits for each alternative have been estimated;

Large expansion has an estimated profitability of Rs.10 000 000 and Rs.6 000 000 for high demand and low demand respectively.

Small expansion has a profitability of Rs.5 000 000, assuming that demand is low. Small expansion with an occurrence of high demand would require considering whether to expand further. If the company expands at that point, the profitability is expected to be Rs.7 000 000. If it does not expand further, the profitability is expected to be Rs. 5 000 000.

(i) Draw a decision tree showing the decisions, chance events, and their probabilities, as well as the profitability of outcomes.

(ii) Solve the decision tree and decide what the XYZ company should do.

(10 marks)

(Total 20 marks)

Question No. 04

a) Give three examples showing why a business needs to forecast.

(04 marks)

b) Identify the key differences between qualitative and quantitative forecasting methods.

(04 marks)

(05

c) The number of students enrolled at NNB private university has been steadily increasing over the past five years. The NNB management board would like to forecast enrollment for the next two years in order to better plan the facility.

Year	**Enrollment**
2018	950
2019	1060
2020	1210
2021	1325
2022	1390

Use a linear trend line to forecast enrollment based on previous data for the years 2023 and 2024.

(12 marks)

(Total 20 marks)

Question No. 05

a) Briefly explain the four basic types of product layouts.

(04 marks)

b) Explain the purpose of assembly line balancing and how it supports the needs of the relevant layout.

(04 marks)

c) The tasks given in the following table are to be performed on an assembly line in the sequence specified. The desired output for an assembly line is 50 units per hour.

Task	Immediate Predecessor	Task time (seconds)
A	none	45
B	A	15
C	A	27
D	B	52
E	C, D	7
F	E	18

You are required to answer the following questions.

(i) Compute the cycle time

(ii) Compute the theoretical minimum number of workstations.

(iii) Which tasks should be assigned to which workstations?

(iv) What is the efficiency of the line?

(03 marks for each)

(Total 20 marks)

Question No. 06

a) Explain the objectives of job design. (04 marks)

b) What are the steps involved in work study?

(04 marks)

The following information was the times recorded for each element in minutes, for trials of a particular job.

Elements	Cycle observed timings (in minutes)					Performance Rating
	1	2	3	4	5	
A	0.09	0.08	0.09	0.10	0.09	90
B	0.12	0.11	0.12	0.11	0.12	110
C	0.13	0.13	0.14	0.12	0.12	100
D	0.07	0.06	0.06	0.08	0.07	120

Assuming a total allowance of 15%,

(i) Calculate the normal time for each element.

(ii) Calculate standard time per 8 hours shift.

(iii) Calculate standard production per 8 hours shift.

(04 marks for each)

(Total 20 marks)

Question No. 07

a) Describe each of the four costs of quality: prevention, appraisal, internal failure, and external failure with examples.

(05 marks)

b) What is the purpose of the operating characteristics curve (OCC)?

(05 marks)

c) Describe the relevant costs associated with inventory policies.

(05 marks)

d) Explain the basic concept of ABC analysis of inventory management.

(05 marks)

(Total 20 marks)