



**STRATHMORE BUSINESS SCHOOL**  
**BACHELOR OF SCIENCE IN SUPPLY CHAIN AND OPERATIONS MANAGEMENT**  
**END OF SEMESTER EXAMINATION**  
**SCM 2102: PRODUCTION AND OPERATIONS MANAGEMENT**

**Date:** Wednesday, 27<sup>th</sup> July 2022

**Time:** 2 Hours

**Instructions**

1. This examination consists of **FIVE** questions.
2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

**QUESTION ONE (40 MARKS)**

a) **Birmingham International Airport (Robert Johnston, 1996)**

If you stand in the viewing gallery at Birmingham International Airport at around 5 p.m. on a weekday you will see, in the space of an hour and a half, between ten and twenty flights arrive and depart the new Eurohub transfer terminal. At the same time aircraft are arriving at and leaving the main Terminal next to the Eurohub. Across the runaway and acres of tarmac, at the site of the original airport, the overnight freight operation is just beginning to wake up with the arrival of staff and the preparations for the first aircraft from Europe or the USA.

Inside the Airport, some of the 4,000 staff of the 50 organizations based there see to the needs of their customers. The baggage handling operation is sorting, checking and dispatching bags to the many departing aircraft. The ground crews are loading and unloading aircraft, putting meals on board, filling the fuel tanks and cleaning the aircraft during their brief spell at the airbridge. The airline's ticketing staff are dealing with queues of passengers, each of whom may have a different final destination. The information desk is fully manned, dealing with the many queries: people wanting to know if their plane is on time, or the location of the bank or hotel, or trying to work out how to get by road or rail to their final destination. Passengers flow through the lounges, passport control and security checks, use toilets, duty free shops, restaurants-all of which have to be kept clean and stocked for their convenience. All of

these activities, and more, are designed, managed and controlled by the operations managers of the airport and the associated air travel control.

**Required:**

- i. Using the information from the case provided, explain the term Operations Management emphasizing on the transforming and transformed resources. **(6Marks)**
  - ii. Outline any four roles/responsibilities of an operations manager. **(4 Marks)**
- b) ABC Ltd produces apple crates, which it sells to growers. With the current equipment ABC produces 240 crates per 100 logs. It currently purchases 100 logs per day, and each log requires three labour hours to process. ABC is considering the hire of a professional buyer who can buy better quality logs at the same cost. If this is the case, ABC can increase production to 260 crates per 100 logs, and the labour hours required will increase by eight hours per day (for the buyer).
- i. Identify the type of productivity to compute in this case. **(1 Mark)**
  - ii. Compute the productivity for the current method (i.e., no buyer). **(2 Marks)**
  - iii. What will the productivity be if ABC hires the professional buyer? **(2 Marks)**
  - iv. Suppose that ABC spends Kshs 12 per hour for each worker who constructs the crates. The buyer, however, is paid Kshs 24 per hour. The material cost is Kshs 10 per log (regardless of who purchases them). Compute the multifactor productivity for the current method, using crates per shilling cost (labour +materials) as the measure. **(3 Marks)**
  - v. How does the multifactor productivity change if the professional buyer is hired? **(2 marks)**
- c) You are in the water melon business and your greatest worry is customer complaints about the shape of the water melons. You have read a Japanese case of a farmer who has invented square water melons and you are thinking about going that route too. Discuss using three (3) points how the square water melon will meet the intentions of your customers. **(6 Marks)**

d) You are starting a new college in town for supply chain related courses. Develop a framework for your product design. **(8 Marks)**

e) Using a real life example, explain any five (5) elements of operations strategy. **(5 Marks)**

### **QUESTION TWO (15 MARKS)**

i. Using five (5) points, distinguish between product and process layouts. **(5 Marks)**

ii. Using Strathmore University as a case of reference, explain the idea of service design emphasizing on the distinction between service design and product design. **(10 marks)**

### **QUESTION THREE (15 MARKS)**

A firm that produces wooden chairs and book cases has received two orders for shutters; one for 100 shutters and one for 150 shutters. The 100-unit order is due for delivery at the start of week 4 of the current schedule, and the 150 unit-order is due for delivery at the start of week 8. Each shutter consists of two frames and four slatted wood sections. The wood sections are made by the firm, and fabrication takes one week. The frames are ordered, and lead time is two weeks. Assembly of the shutters requires one week. There is a scheduled receipt of 70 wood sections in the beginning of week one.

#### **Required:**

i. Develop a master production schedule. **(3 Marks)**

ii. Explode the Bill of Materials. **(3 Marks)**

iii. Determine the size and timing of planned-order releases necessary to meet delivery requirements under Lot-for-lot ordering (planned order releases equal to net requirements). **(9 Marks)**

### **QUESTION FOUR (15 MARKS)**

Explain any three (3) components of computer integrated manufacturing. **(6 Marks)**

ii. Outline any two (2) quality points of Deming. **(2 Marks)**

i. You are looking into employing a production planner. Develop a job design for the position. **(7 Marks)**

### **QUESTION FIVE (15 MARKS)**

- i. With recent developments on sustainability and industry 4.0. Will you be for convergence or divergence? Argue your case. **(5 Marks)**
- ii. Proctor and Gamble Ltd is a multinational consumer goods company whose products include pet foods, cleaning agents and personal care products. Recently, the company has not been doing well in some of its products hence making it lose most of its sales. Assuming you are the production and operations manager of Proctor and Gamble Ltd, explain how you would make the company be a leader in the industry using the quality and speed advantage. **(5Marks)**
- iii. Using Coca-Cola Sacco Ltd as a case of reference, explain the concept of order qualifiers and order winners of some of their products. **(5 Marks)**