(*University of Choice*)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY MAIN EXAMINATIONS

2023/2024 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER EXAMINATION

FOR THE DEGREE

DOCTOR OF PHILOSOPHY (Phd) IN LOGISTICS & PROCUREMENT

COURSE CODE: **PBA 922/ PBP 922**

COURSE TITLE: **ADVANCED OPERATIONS MANAGEMENT IN LOGISTICS & SUPPLY CHAIN**

DATE: **TIME:FRIDAY 12TH APRIL 2024** **TIME: 2.00- 5.00 PM**

INSTRUCTIONS TO CANDIDATES

*Answer question **ONE** and any other **THREE** questions*

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over

SECTION A

QUESTION ONE

George Gonzales, operations director of Hightone Electronics, Inc. (HEI), sat quietly at the conference table overlooking the lobby of the corporate headquarters office in Palo Alto, California. He reflected on the board meeting that had just adjourned and the challenge that lay ahead for him. The board had just announced their decision to start an Internet-based division of HEI. Web-based purchasing in the electronics industry had been growing rapidly. The board felt that HEI needed to offer online purchasing to its customers in order to maintain its competitive position. The board looked to George to outline the key operations management decisions that needed to be addressed in creating a successful Internet-based business. The next board meeting was just a week away. He had his work cut out for him. Hightone Electronics, Inc. was founded in Palo Alto, California, over 50 years ago. Originally, the company provided radio components to small repair shops. Products were offered for sale through a catalog that was mailed to prospective customers every four months. The company built its reputation on high quality and service. As time passed, HEI began supplying more than just radio parts, adding items such as fuses, transformers, computers, and electrical testing equipment. The expansion of the product line had been coupled with an increase in the number and type of customers the company served. Although the traditional repair shops still remained a part of the company's market, technical schools, universities, and well-known corporations in the Silicon Valley were added to the list of customers. Today HEI operates the Palo Alto facility with the same dedication to supplying quality products through catalog sales that it had when it was first founded. Customer service remains the top priority. HEI stocks and sells over 22,000 different items. Most customers receive their orders within 48 hours, and all components are warranted for a full year. Expanding HEI to include Web-based purchasing seems to be a natural extension of catalog sales that the company already does successfully. George Gonzales agrees that the company has no choice but to move in this competitive direction. However, George does not agree with the opinion of the board that this would be "business as usual." He believes that there are many operations decisions that need to be identified and addressed. As he stated in the meeting, "Having a slick website is one thing, but making sure the right product is delivered to the right location is another. Operations is the key to making this happen." His challenge for the next board meeting was to identify the key operations decisions and persuade the board that these issues needed serious consideration.

Case Questions

a) Explain why operations management is critical to the success of a business. Why would developing an Internet-based business require different operations considerations for HEI? Is George Gonzales correct in his assessment that this would not be "business as usual"? (10 marks)

b) Recall that HEI wishes to continue its reputation of high quality and service. Identify key operations management decisions that need to be considered. How different will these decisions be for the Internet business? (12 marks)

c) Account for Business Process reengineering, Six Sigma, Lean manufacturing from Hightone Electronics perspective (12 marks)
d) Describe three ideal skills likely to be possessed by operations manager of HIE incorporation (6 marks)

Section B

Question two

a) A car manufacturer would like to set an assembly line in Kenya. Briefly describe four operational factors it might have considered in locating the plant in Kenya (8 marks)

b) A wholesaling company has three warehouses from which suppliers are drawn for four retail customers. The company deals in a single product, the suppliers of which at each warehouse are:

Warehouse No.	**Supply (Unit)**
I	20
II	28
III	17

Customer No.	**Demand (Units)**
A	15
B	19
C	13
D	18

Conveniently total supply at the warehouse is equal to total demand from the customers. The table below gives the transportation costs per unit shipped from each warehouse to each customer.

	CUSTOMER				
WAREHOUSE		A	B	C	D
	I	3	6	8	5
	II	6	1	2	5
	III	7	8	3	9

i. Determine the supplies to dispatch from each of the warehouses to each customer so as to minimize overall transportation cost (Use Least Cost Method) (8 Marks)
ii. Check for the optimality, in the solution obtained above (i) (4 Marks)

QUESTION THREE

a) A small project consists of ten activities has the following characteristics

Activity	Immediate Proceeding activity	Optimistic time estimate	Pessimistic time estimate	Most likely time estimate
A	None	1	5	3
B	A	3	8	4
C	B	10	20	15
D	C	5	11	8
E	B	4	8	6
F	E	20	20	20
G	C	5	12	7
H	D	2	5	3
I	G, H	2	2	1
J	F, I	1	1	1

i) Prepare the activity schedule for the project (8 marks)
ii) Determine the critical path (2 marks)
iii) If 90 days deadline is imposed, what is the probability that the project will be finished within the time? (5 marks)

b) Operations management is a field of business that involves managing the operations of a business to ensure efficiency in the execution of projects. Elucidate the statement bringing out three key functions of an operations manager (5 marks).

QUESTION FOUR

a) The head operations departmental in a Company has four subordinates and four tasks to be performed. The subordinates differ in efficiency and the tasks differ in their intrinsic difficulty. His estimates of the time (hours) each man would take to perform each task is given in the following matrix.

Subordinates	Tasks			
	I	**II**	**III**	**IV**
A	8	26	17	11
B	13	28	4	26
C	38	19	18	15
D	19	26	24	10

How should the tasks be allocated to subordinates so as to minimize the total man-hours? (10 marks)

b)..Economists site a variety of reasons for changes in productivity. Using well articulated describe the principle factors which are likely to influence productivity (10 marks)

QUESTION FIVE

a) Assume you are an operations director of a large-scale retail outlet which have experienced a downward trend in its operations; write a brief report to the Board of directors informing on how you would create a competitive landscape of the large-scale retail outlet, bringing out clearly on the determinants of effective capacity (10 marks).

b) Given below are particulars of XYZ factory