



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF TECHNICAL AND ENGINEERING EDUCATION AND TRAINING

PTE6246 Production Management

Main Examination

December 2024

This examination paper consists of seven (3) printed pages

Time allowed: 3 hours
Total marks: 100
Examiner: Mr. P. P. Makokoro
External Examiner: Dr. Kahanji

INSTRUCTIONS

1. Answer any **FOUR** questions.
2. Sub-division marks are shown in brackets
3. Begin each question on a fresh page and number it.

MARK ALLOCATION

QUESTION	MARKS
1	25 marks
2	25 marks
3	25 marks
4	25 marks
5	25 marks
6	25 marks

Question 1.

- a. Briefly describe the term Just-In-Time (JIT) Production as used in Production Management. (5 marks)
- b. State and explain five (5) advantages of JIT Production. (10 marks)
- c. Explain the following challenges of JIT Production:
 - i. Supply Chain Disruptions (2 marks)
 - ii. High dependency on Suppliers (2 marks)
 - iii. Increased Transportation Costs (2 marks)
 - iv. Demand Variability (2 marks)
 - v. Implementation Costs (2 marks)

Question 2

- a. Evaluate the significance of Quality Control in Production Management under the following sub-headings:
 - i. Customer Satisfaction (3 marks)
 - ii. Cost Reduction (3 marks)
 - iii. Compliance and Standards (3 marks)
 - iv. Continuous Improvements (3 marks)
 - v. Market Competitiveness (3 marks)
- b. Explain how the following Quality Management Tools and Techniques as used in Production Management:
 - i. Total Quality Management (TQM) (2 marks)
 - ii. Statistical Process Control (SPC) (2 marks)
 - iii. Six Sigma (2 marks)
 - iv. Quality Audits (2 marks)
 - v. Fishbone Diagram (2 marks)

Question 3

Discuss the impact of the following Technological Advancements has transformed production processes:

- a. Automation and Robotics (5 marks)
- b. Industry 4.0 and Internet of Things (IoT) (5 marks)
- c. Advanced Analytics and Big Data (5 marks)
- d. Artificial Intelligence (AI) and Machine Learning (5 marks)
- e. Virtual Reality (VR) and Augmented Reality (AR) (5 marks)

Question 4

- a. How does employee involvement influence production efficiency in Production Management? (10 marks)
- b. Discuss the following methods used to engage employees in the production process.
 - i. Empowerment through Decision-Making (3 marks)

- ii. Regular Training and Development (3 marks)
- iii. Job Rotation (3 marks)
- iv. Cross-Functional Teams (3 marks)
- v. Open Communication Channels (3 marks)

Question 5

- a. What is lean manufacturing? (2 marks)
- b. State and explain any 4 steps involved in implementing lean production in the production process. (20 marks)
- c. Outline any three (3) benefits of lean production. (3 marks)