



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:2023/2024
FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE
DEGREE OF BACHELOR OF TECHNOLOGY IN ELECTRICAL AND
ELECTRONIC ENGINEERING

TEE 4417: INDUSTRIAL ENGINEERING MANAGEMENT

PAPER 1

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2024

TIME: 2 HOURS

DATE: Pick Date Select Month Pick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **five** Questions; Question ONE is compulsory. In addition, attempt any Other TWO Questions.

Do not write on the question paper.

Question ONE (Compulsory 20 marks)

- a) A milling plant has warehouse inventory of 50 metric tons of wheat grain that is fed into the milling process. By weight ratios, the wheat converts to 75% wheat flour, 20% feed and 5% dust loss. During a spot inventory taking, there was 25 metric tons of wheat flour. Calculate the work in progress in terms of;
- Wheat flour milled
 - Dust milled
 - Wheat flour WiP
 - Feed WiP
 - Dust WiP.
- 3 Marks**
- b) Briefly explain the following terms as used in linear programming in OR
- Decision variable
 - Constraint
 - Objective function.
- 3 Marks**

- c) Briefly explain what is “out-of-stock” and how it affects a brand. **3 Marks**
- d) Compare and discuss Lean versus Six Sigma production methods. **3 Marks**
- e) List six applications of the Markov models. **3 Marks**
- f) Briefly explain how by using a Lean Manufacturing process, a company can realise;
 - (i) Reduced lead times
 - (ii) Low operating costs **2 Marks**
- g) Explain briefly how order cycles in inventory cushion companies from material price vagaries. **3**

Marks

Question TWO (20 Marks)

- a) Using a labelled diagram, explain work study in management science and how it can be used to effect optimum use of resources **4 Marks**
- b) Explain briefly what is product design and how it influences the performance of a product in the market place **4 Marks**
- c) Briefly explain the difference between a Push and Pull production system **2 Marks**
- d) Discuss supply chain in manufacturing industry scenario and the roles of
 - (i) Material source and examples
 - (ii) Process
 - (iii) Outlets **6 Marks**
- e) Briefly explain what is WIP in production and give three disadvantages of having too much stock in WIP **4 Marks**

Question THREE (20 Marks)

- a) Compare the merits and demerits of VA against VE and select suitability in specific product manufacturing **7 Marks**
- b) Prepare a maintenance schedule for a grain handling conveyor line during shutdown **5**

Marks

- c) In flow production, explain how the managers apply the features to make production efficient. **5**

Marks

- d) Using examples briefly explain what is unnecessary cost in production **3 Marks**

Question FOUR (20 Marks)

- a) Briefly explain Kanban change management and service delivery principles. **6 Marks**
- b) List and explain six main lean manufacturing tools used in management. **4 Marks**
- c) Briefly explain how specialised production is different from custom production methods listing its salient features and two types of common products. **5 Marks**
- d) Briefly explain four main factors that influence the selection of equipment in industry.

5

Marks

Question FIVE (20 Marks)

- a) Briefly explain what is job evaluation and how it is conducted in a manufacturing set-up.

5

Marks

- b) Explain how the following functions are achieved for smooth production.

- i. Decoupling operations
- ii. Prevention against stock-outs
- iii. Order cycles

3 Marks

- c) Incentives are a common schemes used in industry. Discuss the types, why they work and sometimes fail to deliver expected results **7 Marks**

- a) Briefly explain the design thinking process and show the steps of the process **5 Marks**