MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
FOURTH YEAR FIRST SEMESTER EXAMINATIONS

SPECIAL/ SUPPLIMENTARY

FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN MECHANICAL AND INDUSTRIAL ENGINEERING AND RENEWABLE ENERGY TECHNOLOGY

COURSE CODE: MIE 401

COURSE TITLE: INDUSTRIAL ENGINEERING

DATE: MONDAY 3/10/2021   **TIME:** 9.00 - 11.00 AM

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer Any Other TWO (2) questions

TIME: 2 Hours

▶

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

QUESTION ONE
a) Explain any four objectives of production management. (4 marks)
b) Discuss the main principles of plant layout. (7 marks)
c) The new Health-care facility is targeted to serve seven census tracts in Delhi. The table given below shows the coordinates for the center of each census tract, along with the projected populations, measured in thousands. Customers will travel from the seven census tract centers to the new facility when they need health-care. Two locations being considered for the new facility are at (5.5, 4.5) and (7, 2), which are the centers of census tracts C and F. Details of seven census tract centers, co-ordinate distances along with the population for each center are given below. If we use the population as the loads and use rectilinear distance, which location is better in terms of its total load-distance score? (8 marks)

Sl. No.	Census tract	(x, y)	Population (l)
1	A	(2.5, 4.5)	2
2	B	(2.5, 2.5)	5
3	C	(5.5, 4.5)	10
4	D	(5, 2)	7
5	E	(8, 5)	10
6	F	(7, 2)	20
7	G	(9, 2.5)	14

d) Briefly illustrate the principle of preventive maintenance as a type of maintenance conducted in industries (5 marks)
e) Define an obsolete item, (1 marks)
f) Explain any five objectives of employing material handling in a plant. (5 marks)

QUESTION TWO

Referring to the pay-off table 1, determine which alternative would be chosen under each of these strategies:
(a) Maximin, (5 Marks)
(b) Maximax (7 Marks)
(c) Laplace (8 Marks)

Table 1

Alternatives	Possible future demand in Rs.		
	Low	Moderate	High
Small facility	10	10	10
Medium facility	7	12	12
Large facility	(4)	2	16

QUESTION THREE (20 Marks)
Given the product structure tree shown in FIG 1 for wheelbarrow W099, develop an indented bill of materials.

```
                        Wheelbarrow
                           W099
        ┌──────────────┬──────────────┬──────────────┐
    Box (1)         HBA (1)        WHA (1)        Paint (1)
     1011            1020           1030            1042
              ┌────────┴────────┐    ┌──────────┬──────────┬──────────┐
          BOX (2)          GRIPS (2)  AXLE (1)   BRNG (2)    WHL (1)
           2022             2025       2031       2032        2035
                                                              │
                                                          TIRE (1)
                                                            3026
```
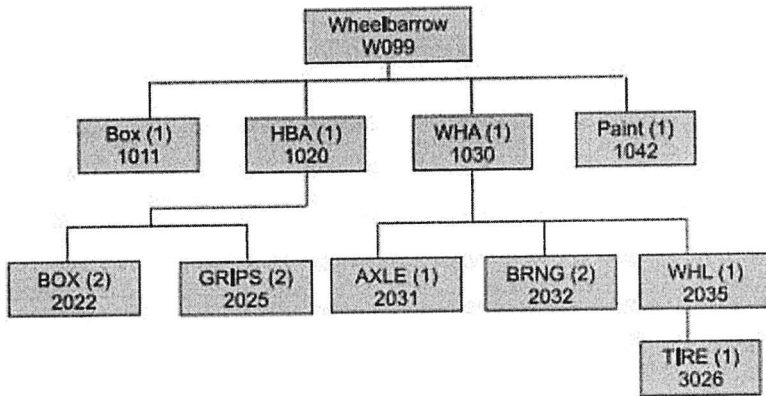
QUESTION FOUR   (20 Marks)

Explain the principle of final inspections, the two methods used to achieve it. Also, elaborate on its drawbacks.