BBA in TM, 7th Sem.

Date: October 6, 2023 (Afternoon)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Mid-Semester Examination
Course No.   : BTM 4701
Course Title   : Operations Research

Winter Semester, A. Y. 2022-2023
Time   : 1.5 hours
Full Marks   : 75

Answer all 3 (three) questions. All questions carry equal marks. Marks of each question and corresponding CO
and PO are written in the right margin with brackets.

1. a) Explain major phases of Operations Research. — 5 (CO1) (PO1)

   b) Discuss the classification of various process of Operations Research. — 7 (CO1) (PO2)

   c) "Operations Research is not one rather it consists of many techniques"- Explain your understanding about this statement. — 13 (CO3) (PO4)

2. A factory manufactures two products A and B. To manufacture the product A, a certain machine has to be worked for 1-5 hours and in addition a craftsman has to work for 2 hours. To manufacture the article B the machine has to be worked for 2.5 hours and in addition the craftsman has to work for 1.5 hours. In a week the factory can avail of 80 hours of machine time and 70 hours of craftsman's time. The profit on each product A is tk 5 and on product B is tk 4.
   Instructions:
   i) Prepare data summary chart.
   ii) Construct the graph.
   iii) Identify the feasible solution space.
   iv) Find how many of each kind should be produced to earn the maximum profit per week. — 25 (CO3) (PO4)

3. a) Explain the process of formulating linear programming problem. How can you use linear programming in your real life? — 10 (CO3) (PO1)

   b) A manufacturer can produce two different products, A and B during a given time period. Each of these products requires four different manufacturing operations: Grinding, Turning, Assembly, and Testing. The manufacturing requirements in hours per unit of product are given below for; — 15 (CO2) (PO2)

	Product A	Product B
Grinding	1	2
Turning	3	1
Assembly	6	3
Testing	5	4

The available capacities of these operations in hours for the given time period are Grinding 30; Turning 60; Assembly, 200; Testing200. The contribution to profit is Tk 2 for each unit of A and Tk 3 for each unit of B. The firm can sell all that it produces at the prevailing market price. Formulate the problem as a linear programming model to maximize profit.