UNIVERSITY OF KARACHI

DEPARTMENT OF COMPUTER SCIENCE
(MORNING / EVENING PROGRAMME)
MASTERS IN COMPUTER SCIENCE (PREVIOUS)
SEMESTER – FIRST SEMESTER 2021
COURSE CS-507 – LINEAR PROGRAMMING
CLASS ASSIGNMENT I
(CASE STUDY : PPMO CASE STUDY)

DATED : (THE NEXT CLASS SESSION)

PROBLEM 1-A

A petroleum products manufacturing organisation (we will refer that as PPMO in further discussion) produces two types of petroleum products: PetroleumA and PetroleumB, by mixing two of the ingredients: CrudeOil1 and CrudeOil2, with certain specific ratio as given in the following table:

	CrudeOil1	CrudeOil2
PetroleumA	70%	30%
PetroleumB	60%	40%

Determine the quantities of CrudeOil1 and CrudeOil2 required for producing 1 litre of PetroleumA and 1 litre of PetroleumB.

PROBLEM 1-B

If the PPMO wants to produce 100 litres of PetroleumA and 200 litres of PetroleumB, then determine how much quantities of CrudeOil1 and CrudeOil2 would be required?

PROBLEM 1-C

Assume that the PPMO wants to produce P_A litres of PetroleumA and P_B litres of PetroleumB, determine how much quantities of CrudeOil1 and CrudeOil2 would be required?

PROBLEM 1-D

Assume that TCO1 and TCO2 are the total quantities of CrudeOil1 and CrudeOil2 required for the production. Represent the information using the system of linear equations.

PROBLEM 1-E

Convert the system of linear equations (designed for the above problem) into the matrix form.

PROBLEM 1-F

What will be the change in the system of linear equations when:

(a) the number of products are changed from 2 to 3.

(b) the number of ingredients are changed from 2 to 4.

(c) both (a) and (b) happen together?

PROBLEM 1-G

Assume that the PPMO has 200 litres of CrudeOil1 and 100 litres of CrudeOil2. How much quantities of PetroleumA and PetroleumB can be produced using the available ingredients?

WISH YOU THE BEST OF LUCK

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