School of Computing
FAST National University, Lahore

Class: BS Software Engineering **Subject:** Operations Research
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PRACTICE QUESTIONS (ASSIGNMENT PROBLEMS)

QUESTION # 1:
A machine tool company decides to make four subassemblies through four contractors. Each contractor is to receive only one subassembly. The cost of each subassembly is determined by the bids submitted by each contractor and is shown in below table in thousand of rupees.

		Contractors			
		1	**2**	**3**	**4**
Subassemblies	**1**	15	13	14	17
	2	11	12	15	13
	3	13	12	10	11
	4	15	17	14	16

Assign the different subassemblies to contractors so as to minimize the total cost.

QUESTION # 2:
In the modification of a plant layout of a factory four new machines M_1, M_2, M_3, M_4 are to be installed in a machine shop. There are five vacant places A, B, C, D and E that are available. Because of limited space, machine M_2 cannot be placed at C and M_3 cannot be placed at A. The cost of placing of machine 'i' at place 'j' (in rupee) shown below:

		Location				
		A	B	C	D	E
Machine	M_1	9	11	15	10	11
	M_2	12	9	-	10	9
	M_3	-	11	14	11	7
	M_4	14	8	12	7	8

Find the optimal assignment schedule.

QUESTION # 3:
A Company has four territories open, and four salesmen available for the assignment. The territories are not equally rich in their sales potential; it is estimated that a typical salesman operating in each territory would bring in the following annual sales:

Territory:	I	II	III	IV
Annual Sales (Rs):	60,000	50,000	40,000	30,000

Four salesmen are also considered to differ in their ability. It is estimated that working under the same conditions, their yearly sales would be proportional as follows:

Salesmen:	A	B	C	D
Proportion:	7	5	5	4

If the criterion is maximize expected total sales, then the intuitive answer is to assign the best salesman to the richest territory, the next best salesman to the second richest and so on. Verify this answer by the assignment technique.