

TAKE AWAY CAT.
TO BE DONE IN GROUPS OF 5 MEMBERS PER GROUP

- (a) A farmer produces eggs and milk on two days; on Monday and Thursday. He requires *Ksh* 2 to produce eggs and *Ksh* 6 to produce a litre of milk on Monday. He requires *Ksh* 4 and *Ksh* 2 to produce egg and litre of milk respectively on Thursday. If he has a maximum of *Ksh* 30 on Monday and *Ksh* 20 on Thursday. Find the maximum profit he makes if he sells each egg at *Ksh* 18 and each litre of milk at *Ksh* 12 using *simplex method*.
- (b) A manager has three projects to be assigned to three of his workers. Workers differs in efficiency. The efficiency is a measure of time taken by them to do various jobs. The matrix given below shows the time taken by each worker to do a particular job.

PROJECTS	MEN (Time take to do job in hours)		
	X	Y	Z
1	11	14	6
2	8	10	11
3	9	12	7

- (i) Assign the duty to the staff using Hungarian method
(ii) Find the minimum total time taken by the workers
- (c) Write the dual of the linear programming below
Maximize $= 6x + 2y + 3z$

Subject to

$$3x + 2y + z \leq 28$$

$$6x + y + z \leq 24$$

$$3x + y + 2z \leq 40$$

$$x, y, z \geq 0$$

- (a) Find the minimum value of
 $= 2x_1 + 10x_2 + 8x_3$

Subject to

$$x_1 + x_2 + x_3 \geq 6$$

$$x_2 + 2x_3 \geq 8$$

$$-x_1 + 2x_2 + 2x_3 \geq 4$$

$$x_1, x_2, x_3 \geq 0$$

- (b) Consider the following transportation table for a minimization problem.

Source	A	B	C	Capacity
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D	5	4	3	100
E	8	4	3	300
F	9	7	5	300
Demand	300	200	200	

Find the initial feasible solution using

- (i) North West corner method
- (ii) Least cost method