(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3090 Roll No. | | | | | | | | | | |

B. Tech.

(SEM. VI) THEORY EXAMINATION 2010-11

INDUSTRIAL MANAGEMENT

Time : 3 Hours *Total Marks : 100*

Note :— Attempt **ALL** questions.

1. Attempt any **four** questions. Each question carries **5** marks : **(4×5=20)**

(a) Solve the following linear programming problem by Graphical method :

Max. :

$$Z = 3X_1 + 5X_2$$

subject to :

$$X_1 + 2X_2 \leq 2000$$

$$X_1 + X_2 \leq 1500$$

$$X_2 \leq 600$$

and $X_1, X_2 \geq 0$.

(b) Show the mathematical formulation of transportation problem.

(c) What is Game theory ? Discuss its importance in business decisions.

(d) How does the PERT technique different from CPM ?

(e) Write the dual of the following L.P.P. :

Min. :

$$Z = 3X_1 - 2X_2 + 4X_3$$

subject to :

$$3X_1 + 5X_2 + 4X_3 \geq 7$$

$$6X_1 + X_2 + 3X_3 \geq 4$$

$$X_1 - 2X_2 + 5X_3 \geq 3$$

where $X_1, X_2, X_3 \geq 0$.

(f) Write the flow chart of HAN.

2. Attempt any **two** questions : **(2×10=20)**

(a) Explain the phases of OR study. How OR is beneficial in decision making ?

(b) Solve the Game whose pay-off matrix to the player A is given in the table :

		Player B		
		I	II	III
Player A	I	1	7	2
	II	6	2	7
	III	5	2	6

(c) Solve the following L.P.P. by Simplex method :

Max. :

$$Z = 5X_1 - 2X_2 + 3X_3$$

subject to :

$$2X_1 + 2X_2 - X_3 \geq 2$$

$$3X_1 - 4X_2 \leq 3$$

$$X_2 + 3X_3 \leq 5$$

where $X_1, X_2, X_3 \geq 0$.

3. Attempt any **two** questions : **(2×10=20)**

(a) Solve the following transportation problem to maximize profit and give criteria for optimality :

		Destination				
		I	II	III	IV	Supply
Origin	A	42	27	24	35	200
	B	46	37	32	32	60
	C	40	40	30	32	140
	Demand	80	40	120	60	

(b) Explain the following terms in the context for project management :

(i) Resource Float

(ii) Activity Variance.

(c) Write a brief note on the historical development of Engineering Management.

4. Attempt any **two** questions : **(2×10=20)**

(a) Explain various models used in OR study.

(b) A company has six jobs to be performed on six machines, any job can be done on any machines. The time in hours taken by the machines for the different jobs are as given

below. Assign the machine to jobs so as to minimize the total machine-hours :

		Jobs					
		I	II	III	IV	V	VI
Machine	A	2	6	7	3	8	7
	B	6	1	3	9	7	3
	C	3	6	5	7	3	5
	D	2	2	7	8	4	8
	E	4	9	6	8	7	6
	F	7	5	5	7	7	5

(c) Write a brief note on Statistical Quality Control.

5. Attempt any **two** questions : **(2×10=20)**

(a) "Decision making is the essence of all managerial activities." Highlight the significance of the statement. Also explain the process of decision making.

(b) While managing technology, what functions are performed by an Industrial Engineer in order to increase the efficiency ?

(c) A person wants to decide the constituents of a diet which will fulfil his daily requirements of proteins, fats and carbohydrates at the minimum cost. The choice is to be made from four different types of foods. The yields per unit of these foods are given in the following table :

Food type	Yield Per Unit			Cost per Unit (Rs.)
	Proteins	Fats	Carbohydrates	
I	3	2	6	45
II	4	2	4	40
III	8	7	7	85
IV	6	5	4	65
Minimum Requirement	800	200	700	