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

PAPER ID : 3090 Roll No.

B.Tech.

(SEM VI) EVEN SEMESTER THEORY EXAMINATION, 2009-2010

INDUSTRIAL MANAGEMENT

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt **all** questions.*

*(ii) All questions carry **equal** marks.*

1. Attempt **any two** parts of the following : **(2x10=20)**

(a) "Operation research is an aid for the executive in making his decision by providing him with the needed quantiative information, based on the scientific method analysis." Discuss this statement in detail, illustrating it with OR methods that you know.

(b) An Air Force is experimenting with three types of bombs, P, Q and R in which three kinds of explosives, viz. A, B and C will be used. Taking the various factors into account, it has been decided to use the maximum 600 kg of explosive A, at least 480 kg. of explosive B and exactly 540 kg. of explosive C. Bomb P requires 3, 2, 2 kgs. Bomb Q requires 1, 4, 3 kg. and Bomb R requires 4, 2, 3 kgs of explosive A, B and C respectively. Bomb P is estimated to give the equivalent of a 2 ton explosion, Bomb Q, a 3 ton explosion and Bomb R, a 4 ton explosion respectively. Under what production schedule can the Air Force make the biggest bang ?

(c) Define a Scientific model. Discuss in detail three types of models with special emphasis on the important logical properties and the relationships the three types bear to each other and to modelled entities.

2. Answer **any two** parts of the following : **(2x10=20)**

(a) (i) Explain the concept of degeneracy in simplex method.

(ii) Solve the following problem using simplex method.

Maximize $Z = 2x_1 + 3x_2 + x_3 + 7x_4$

S.T. $8x_1 + 3x_2 + 4x_3 + x_4 \leq 6,$

$2x_1 + 6x_2 + x_3 + 5x_4 \leq 3,$

$x_1 + 4x_2 + 5x_3 + 2x_4 \leq 7,$

$x_1, x_2, x_3, x_4 \geq 0.$

(b) (i) Define trans - shipment model. Explain its application.

(ii) Solve the following T.P. using Vogel's method in order to minimize the total transportation cost :

		Destination					
		D_1	D_2	D_3	D_4	D_5	Availability
Origin	O_1	3	5	8	9	11	20
	O_2	5	4	10	7	10	40
	O_3	2	3	8	7	7	30
Demand		10	15	25	30	40	

(c) (i) Explain crashing of project networks.

(ii) Activities, their durations and crew sizes required to implement them are given below :

Activity :	1 - 2	1 - 3	1 - 5	2 - 3	2 - 6	3 - 4	4 - 7	5 - 6	6 - 7
Duration :	10	6	5	0	8	10	10	7	5
Crew size :	1	2	3	0	1	2	3	1	2

Schedule the project when only 3 men are available for executing it.

Answer **any two** of the following : **(2x10=20)**

(a) (i) For what type of business problems might game theory be helpful ?

(ii) Find the values of X and Y so that the following game has a saddle point :

	Player B		
Player A	18	Y	36
	X	54	99
	63	27	36

(b) (i) Explain clearly :

(A) Strategy

(B) Pay off matrix

(C) Two person zero - sum game.

(ii) Find the best strategy and the value of the following game :

		B		
		I	II	III
A	I	– 1	– 2	8
	II	7	5	– 1
	III	6	0	12

(c) "The assumptions in queuing theory are so restrictive as to render behaviour prediction of queuing system practically worthless." Discuss.

4. Answer **any two** parts of the following : **(2x10=20)**

(a) (i) Explain characteristics and classification of queuing models.

(ii) Explain queue parameters.

(b) Explain briefly the following :

(i) MODI method

(ii) Loops in T.P.

(c) Explain the following with reference to L.P.P.

(i) Entering variable

(ii) Leaving variable

(iii) Slack variable

(iv) Surplus variable

(v) Artificial variable

5. Write short note on **any four** : **(4x5=20)**

(a) Historical development of Engineering Management.

(b) Project Leadership

(c) Project time - Project cost trade off.

(d) IPR

(e) Process of controlling

(f) Methods of forecasting.

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