

END TERM EXAMINATION

SECOND SEMESTER [BBA(B&I)/(TTM)]- MAY 2011

Paper Code: BBA(B&I)106

Subject: Quantitative Techniques & Operation
Research in Management

Time : 3 Hours

Maximum Marks : 75

Note: Q.no.1 is compulsory. Attempt one question from each unit.

- Q1 Explain **any three** of the following:- (5×3=15)
- Types of solution of LPP.
 - Karl Pearson coefficient of correlation v/s Rank correlation.
 - Methods to study Dispersion.
 - Hungarian method for Assignment Problem.
 - Simplex method for solving LPP.

UNIT-I

- Q2 If Arithmetic mean is 1.46, find the missing frequencies and then find median of the distribution. (10+5=15)

No. of accidents	0	1	2	3	4	5	Total
Frequency	46	?	?	25	10	5	200

- Q3 The following are the number of goals scored by the two teams A and B in last 5 matches find:-
- Which team is more consistent? (10)
 - Which team has more goals per match? (5)

Team A	6	10	7	9	3
Team B	3	4	5	5	3

UNIT-II

- Q4 (a) Calculate the Karl Pearson coefficient of correlation between expenditure and sales. (7)

Expenditure	39	65	62	90	82	75	25	98	36	78
Sales	47	53	58	86	62	68	60	91	51	84

- (b) The coefficient of rank correlation of the marks obtained by 10 students in two particular subjects was found to be 0.5. It was later discovered that the difference in ranks in two subjects obtained by one of the students was wrongly taken as 3 instead of 7. What is correct value of r? (8)

- Q5 (a) In regression analysis the following results are obtained. Variance of $x=9$ and regression lines are $8x-10y=-66$, $40x-18y=214$. What are:- (10)

- The mean value of x and y .
- The regression coefficient.
- Correlation coefficient.
- The standard deviation of y .
- The $cov(x,y)$.

- (b) Given $n=100$, $\sum XY=10,07,425$, $\sum X=12,500$, $\sum X^2=15,85,000$, $\sum Y=8,000$, $\sum Y^2=6,48,100$. For the above data obtain regression equation Y and X . (5)

P.T.O.

UNIT-III

- Q6 (a) Solve the following linear programming problem by simplex method (9)
 Maximize $z = 80x_1 + 600x_2 + 300x_3$,
 subject to: $10x_1 + 4x_2 + 5x_3 \leq 2000$,
 $2x_1 + 5x_2 + 4x_3 \leq 1009$,
 $x_1, x_2, x_3 \geq 0$.
- (b) Solve graphically. (6)
 Maximize $z = 3x_1 + 2x_2$,
 Subject to: $-2x_1 + x_2 \leq 1$, $x_1 \leq 2$,
 $x_1 + x_2 \leq 3$
 $x_1, x_2 \geq 0$.

- Q7 (a) A firm manufactures headache pills in two sizes A and B. Size A contains 2 grains of aspirin, 5 grains of bicarbonate and 1 grain of codeine. Size B contains 1 grain of aspirin, 8 grains of bicarbonate and 6 grains of codeine. It is found by users that it requires at least 12 grains of aspirin, 74 grains of bicarbonate and 24 grains of codeine for providing the immediate effect. It is required to determine the least number of pills a patient should take to get immediate relief. Formulate the problem only. (7)
- (b) Write the dual of the LPP- (8)
 Minimize $z = 4x_1 + 3x_2$
 Subject to: $2x_1 + x_2 \geq 10$, $-3x_1 + 2x_2 \leq 6$
 $x_1 + x_2 \geq 6$
 $x_1, x_2 \geq 0$

UNIT-IV

- Q8 Find the optimal solution of the transportation problem. (15)

	D ₁	D ₂	D ₃	D ₄	Availability
S ₁	1	2	1	4	30
S ₂	3	3	2	1	50
S ₃	4	2	5	9	20
Demand	20	40	30	10	

- Q9 (a) A company wishes to assign 3 jobs to 3 machines in such a way that each job is assigned to some machine and no machine works on more than one job. The cost of assigning job I to machine j is given by matrix below: (7)

8	7	6
5	7	8
6	8	7

Find the minimum cost of making the assignment.

- (b) Six job to processed on three machines A, B and C. The table gives processing times taken by job on machine. Find the sequence of the jobs that minimize elapsed time to complete the jobs. Find idle time on machines. (8)

Jobs	1	2	3	4	5	6
Machine A	8	3	7	2	5	1
Machine B	3	4	5	2	1	6
Machine C	8	7	6	9	10	9
