

END TERM EXAMINATION

SECOND SEMESTER [BBA] MAY-JUNE 2018

Paper Code: BBA-106 Subject: Quantitative Techniques and Operations
BBA(B&I)-106 Research in Management
BBA(MOM)-106
BBA(TTM)-106

Time: 3 Hours**Maximum Marks: 75****Note: Attempt any five questions. All questions carry equal marks.**

- Q1 (a) Write a short note on various measures of central tendency.
 (b) Find mean for the following distribution using step deviation method.

Class Interval	Frequency
15-25	4
25-35	11
35-45	19
45-55	14
55-65	8
65-75	2

- Q2 The ranking of ten students in accordance with their performance in two subjects A and B are as follows:

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

Calculate the rank correlation coefficient and comment on its value.

- Q3 From the following data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	4	6	10	20	10	6	4

- (i) Calculate mode
 (ii) Calculate quartile deviation
 (iii) Draw histogram
- Q4 (a) Differentiate between Correlation and regression.
 (b) There are nine jobs, each of which must go through two machines P and Q in the order PQ, the processing time (in hours) are given below:

Machine	Job(s)								
	A	B	C	D	E	F	G	H	I
P	2	5	4	9	6	8	7	5	4
Q	6	8	7	4	3	9	3	8	11

Find the sequence that minimizes the total elapsed time T.

- Q5 The ABC Printing Company is facing a tight financial squeeze and is attempting to cut costs wherever possible. At present, it has only one printing contract and, luckily, the book is selling well in both the hardcover and paperback editions. It has just received a request to print more copies of this book in either the hardcover or paperback form. The printing cost for hardcover books is Rs. 600 per 100 while that for paperback is only Rs 500 per 100. Although the company is attempting to economize, it does not wish to lay off any employee. Therefore, it feels obliged to run its two printing presses at least 80 and 60 hours per week, respectively. Press I can produce 100 hardcover book in 2 hours or 100

P.T.O.

BBA-106
 P_{1/2}

paperback book in 1 hour. Press II can produce 100 hardcover book in 1 hour or 100 paperback books in 2 hours. The problem is to determine how many books of each type should be printed in order to minimize costs.

Formulate this as on LPP. Write the dual, and solve the dual using simplex method. Hence, find out the optimal solution of the primal problem.

- Q6 (a) What are the various assumptions of an LP model?
 (b) Explain the following in context of Linear Programming Model: **(Do any three)**
 (i) Degeneracy
 (ii) Unbounded solution
 (iii) infeasible solution
 (iv) Multiple optimal solutions

- Q7 A company has three production facilities S1, S2 and S3 with production capacity of 7, 9 and 18 units (in 100s) per week of a product, respectively. These units are to be shipped to four warehouse D1, D2, D3 and D4 with requirement of 5, 8, 7 and 14 units (in 100s) per week, respectively. The transportation costs (in rupees) per unit between factories to warehouses are given in the table below:

	D1	D2	D3	D4	Capacity
S1	19	30	50	10	7
S2	70	30	40	60	9
S3	40	8	70	20	18
Demand	5	8	7	14	34

Find the optimal solution of this transportation problem so as to minimize the total transportation cost.

- Q8 XYZ Corporation has four plants each of which can manufacture anyone of the four products. Product cost differ from one plant to another as follows:

	Product			
Plant	1	2	3	4
A	33	40	43	32
B	45	28	31	23
C	42	29	36	29
D	27	42	44	38

You are required:

- (a) To obtain which product each plant should produce to minimise cost,
 (b) To build a Linear Programming Model.

BBA-106
P2/2