(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

SECOND SEMESTER [BBA] MAY- JUNE 2016

Paper Code: BBA-106
BBA (B&I)-106
BBA (TTM)-106
BBA (MOM)-106

Subject: Quantitative Techniques and Operations Research in Management

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions. All questions carry equal marks.

Q1 Given the following frequency distribution with some missing frequencies.

Class	Frequency
10-20	185
20-30	?
30-40	34
40-50	180
50-60	136
60-70	?
70-80	50

If the total frequency is 685 and median is 42.6. find out the missing frequencies.

Q2 When is the variance equal to the standard deviation? Under what circumstances can variance be less than standard deviation? Explain.

Q3 A customer care center is receiving following number of complaints every year

Year	**No. of complaints**
2002	210
2003	225
2004	210
2005	220
2006	250
2007	280
2008	285
2009	282
2010	299
2011	312
2012	330

Derive regression equations (Time as independent variable and Number of application as Dependent variable). Also find the demand in the year 2016.

Q4 (a) Consider the following data set:-

Week	1	2	3	4	5	6
Sales	2.69	2.62	2.80	2.70	2.55	2.93

P.T.O.

Find the correlation coefficient between sales and week.

(b) What is Spearman's rank correlation? When is it calculated.

Q5 Solve the following LPP by simplex method

Max $Z = 40X_1 + 50X_2$

s.to $3X_1+4X_2<=120$

$5X_1+3X_2<=150$

X_1, X_2 are non-negative.

Q6 The manager of an oil refinery must decide on the optimal mix of two possible blending processes of which the inputs and outputs per production run are as follows:-

Process	Inputs		Output	
	Crude A	Crude B	Gasoline X	Gasoline Y
1	15	13	15	18
2	14	15	14	14

The maximum amount available of crude A and B are 1000 units and 1200 Units respectively. Market requirement shows that at least 800 units Gasoline X and 600 Units of gasoline Y must be produced. The profit per run from production process 1 and 2 are Rs 5000 and Rs 6000 respectively. Solve the LPP by graphical method. Also write the dual of the same.

Q7 For the following transportation problem find the initial feasible solution using VAM method. Check whether the solution obtained isn optimal or not?

	Destination			
	A	B	C	Supply
Plant 1	12	15	10	1000
Plant 2	14	10	16	2500
Plant 3	13	11	9	3500
Demand	1500	1500	4000	

Q8 An airline that operates seven day a week has the timetable shown below. Crew must have minimum layover of 4 hours between flights. Obtain the pairing of flight that minimizes layover time away from home.

Flight No	Delhi Dept	Mumbai Arrive
701	7 AM	8 AM
702	8 AM	9 AM
703	1 PM	2 PM
704	6 PM	7 PM

Flight No	Mumbai Dept	Delhi Arrive
301	8 AM	9 AM
302	9 AM	10 AM
303	12 Noon	1 PM
304	5 PM	6 PM

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