Jagan Institute of Management Studies
End-Term Examination, September, 2016
Trimester I – PGDM (IB) 2016-18

Quantitative Techniques I
ET_IB_QT-I_2609

Time: 3 Hrs.   *M. Marks: 70*

INSTRUCTIONS: Attempt any SEVEN questions. All questions carry equal marks.

Q 1 The following data represent the market share for the repair of cars and light trucks in 2002 and 2012:

Type of Drink	2002 Percentage	2012 Percentage
Foreign specialists	3.9	6.0
Parts stores with service	7.3	6.4
Repair specialists	12.7	16.2
Service stations, garages	39.1	29.5
Tire stores	8.1	8.9
Vehicle dealers	21.6	26.6
Others	7.3	6.4

a) For each year, construct a bar chart and a pie chart.

b) Construct a side-by-side bar chart of the market share in 2002 and 2012.

c) Based on the results of (a) through (b), what changes in market share have occurred between 2002 and 2012?   **10**

Q 2 a) The pass result of fifty students who took up a class test is given below:

Marks:	4	5	6	7	8	9
No. of students:	8	10	9	6	4	3

If the average marks for all the fifty students were 5.16. Find out the average marks of the students who failed.

b) The mean and variance calculated from a group of 80 observations are 63.2 and 25.93 respectively. If 60 of these observations have mean 64.8 and standard deviation 4, find the mean and standard deviation of the remaining 20 observations.   **10**

Q 3 a) The coefficient of variation of wages of male workers and female workers are 55 percent and 70 per cent respectively, while the standard deviations are 22.0 and 15.4 respectively. Calculate the overall average wages of all workers given that 80 percent of the workers are male.

b) The following results are obtained from wage distributions of workers

in two factories X and Y:

Factory	No. of workers	Mean monthly wages (in Rs.)	Variance of wages (in Rs.)
X	400	450	100
Y	600	500	144

i) Which factory pays larger amount as monthly wages?
ii) Which factory has greater variability in individual wages?   **10**

Q 4 a) The mean and standard deviation of a sample of 100 observations was calculated as 40 and 5.1 respectively by student who took by mistake 50 instead of 40 for one observation. Calculate the correct mean and standard deviation.

b) Karl Pearson's coefficient of skewness of a distribution is 0.32. Its standard deviation is 6.5 and mean is 29.6. Find the mode and median of the distribution.   **10**

Q 5 a) Given is the following information:

$$\begin{array}{lcc} & X & Y \\ \text{Arithmetic Average} & 6 & 8 \\ \text{Standard deviation} & 5 & 40/3 \\ \text{Correlation coefficient} & & 8/15 \end{array}$$

Find out the two regression coefficients and two regression equations.

b) For a bivariate data, the mean value of X is 20 and the mean value of Y is 45. The regression coefficient of Y on X is 4 and that of X on Y is 1/9. Find the two regression equations, Coefficient of correlation between X and Y.   **10**

Q 6 The marketing manager of a large super market chain would like to determine the effect of shelf space on the sales of pet food. A random sample of 12 equal-sized stores is selected with the following results:

Store	1	2	3	4	5	6	7	8
Shelf Space X (Feet)	5	5	5	10	10	10	15	15
Weekly sales, Y ($00)	1.6	2.2	1.4	1.9	2.4	2.6	2.3	2.7

Assuming a linear relationship, find the regression equation and Predict the average weekly sales ($00) of pet food for stores with 8 feet of shelf space for pet food.   **10**

Q 7 a) If the ratio between Laspeyre's index number is 28:27, find the missing figure in the following table:

Commodity	Base Year		Current Year	
	Price	Qty	Price	Qty
X	1	10	2	5
Y	1	5	----	2

b) Two variables have the regression lines with equations: $3X + 2Y = 26$ and $6X + Y = 31$, calculate the correlation coefficient between X and Y. and the standard deviation of Y if variance of X is 25.   **10**

Q 8 Passenger miles flown on Northeast Airlines, a commuter firm serving the Boston hub, are as follows for the past 12 weeks:

Week	Actual passenger Miles (1000s)	Week	Actual passenger Miles (1000s)
1	17	7	20
2	21	8	18
3	19	9	22
4	23	10	20
5	18	11	15
6	16	12	22

a) Assuming an initial forecast for week 1 of 17000 miles, use exponential smoothing to compute miles for weeks 2 through 12. Use alpha = 0.2.
b) What is the MAD for this model?
c) Compute the RSFE and tracking signals. Are they within acceptable limits?   **10**

Q 9 Using the following data, compute Fisher's Ideal Price and Quantity Index numbers for the current year:

Commodity	Base Year		Current Year	
	Price	Qty	Price	Qty
A	8	6	12	4
B	10	8	12	8
C	14	4	18	4
D	4	6	2	10
E	10	10	14	8

10

Q 10 Explain in detail any **TWO** of the following:
a) Standard deviation and Coefficient of Variations.
b) Simple and multiple Regression.
c) Standard and probable error of correlation.   **10**

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