Subject	Business Statistics and Analytics for Decision making		
Roll No.		Marks	60 Marks
Total No. of Questions	7	Duration	3 Hours
Total No. of printed pages	2	Date	29-03-2019

Note: Q1 is compulsory and answer any FOUR from the remaining SIX Questions.
Q1) 20 Marks (Compulsory)

Assuming that you are a financial consultant, need to provide expert advice to clients.
Share price movement of 3 premium stocks for the past 6 months are given below,

	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6
Stock-A	65	75	74	70	66	50
Stock-B	99	70	60	56	70	45
Stock-C	100	92	84	80	74	86

a) Analyze the data using descriptive statistics and draw conclusions
b) Which stock you recommend for your customers to buy and why?

Q2) 10 Marks
a) Explain three different methods of Forecasting and how do you determine which method to adopt?, mention the Formulae for each case
b) Forecast the volume of sales for the data given below using exponential smoothening method for α = 0.2 and α = 0.5 and analyse which α value is to be used. Make necessary assumptions.

Month	Jan	Feb	Mar	Apr	May	Jun
Sales Volume (in K INR)	625	700	450	350	400	750

Q3) 10 Marks
a) Explain the technique of Decision Tree analysis. Give an example / situation when and how you apply this technique in a business context in any one area of your choice Marketing, Finance and Operations.
b) Assuming you are the IT Manager of an organization, considering the options and risks mentioned below, which option you will recommend to the CEO.
Option-1: Build the new software In-house costing 5 Lacks, with a probability of 50% risk with an impact of 4 lacs.
Option-2: Buy the New software costing 8 lacks, with a probability of 5% risk with an impact of 4 lac.
Option-3: Retain the legacy system, which will have 100% probability of risk costing 6 lacs to the company.

Q4) 10 Marks
a) The average monthly sales of 5000 firms are normally distributed. Its mean and standard deviation are Rs. 36000 and Rs. 10000 respectively. Find
   i) The number of firms the sales of which are over Rs. 40000
   ii) The percentage of firms whose sales are between Rs. 38500 and Rs. 41000
b) Using the Spearman rank correlation method find out the correlation coefficient between the Price of Tea and Price of Coffee

Price of Tea	75	88	95	70	60	80	81	50
Price of Coffee	120	134	150	115	110	140	142	100

Q5) 10 Marks
a) The factory has two machines. Past records show that machine 1 produces 30 percent of the items of output and machine 2 produces 70 percent of the items. Further, 5 percent of the items produced by machine 1 were defective and only 1 percent produced by machine 2 were defective. If a defective item Is drawn at a random what is the probability that it is drawn from machine 1 or machine 2?

b)   For the following research question formulate the null hypothesis and explain the one tail and two tail tests?

A company manufacturing automobiles tyres finds that tyre-life is normally distributed with a mean of 40000 Km and standard deviation of 3000 km. It is believed that a change in the production process will result in better product and the company has developed a new tyre. A sample of 100 new tyres has been selected. The company has found that the mean life of these new tyres is 40900 km. Can it be concluded that the new tyre is significantly better than the old one using the level of significance 0.05?

Q6) 10 Marks

a) Estimate the sale for advertising expenditure of Rs. 100 lakhs from the following data

Sales (Rs. Crores)	14	16	18	20	24	30	32
Adv Exp. (Rs. Lakhs)	52	62	65	70	76	80	78

b) Explain the method by which the sample size of a problem is decided?

Q7) 10 Marks

a) Explain Six sigma methodology, detail all 5 phases and which tools you apply in each phase.
b) Define a six sigma problem in any one of the areas of your choice , Marketing / Finance / Operations / HR and build a Fishbone diagram with atleast 3 levels of Why's.