Subject	Business Statistics		
Roll No.		Marks	60 Marks
Total No. of Questions	7	Duration	3 Hours
Total No. of printed pages	3	Date	18.12.2017

Note: Use of scientific calculator is allowed . Statistical tables like Normal,t, F and Chisquare will be provided on request.

Q. 1 is compulsory and carries 20 marks. Attempt any 4 questions from remaining each carrying 10 marks.

Q 1 (a) . Use the data given to test the following hypothesis of a sample :
Ho : Mew = 7.48   ;

X bar = 6.91 ;   n = 120   ; sigma = 1.2   alpha = 0.01

(b)   1500 candidates appeared for a certain examination. The mean
marks were 58 with a standard deviation of 5 marks.   Assuming the
distribution of marks to be normal find
1. The number of students securing marks between 60 and 68.

2. The percentage of students with marks below 53.

Q 2 Answer any 2 from below:

(a) .   Explain the steps in Hypothesis testing procedure.

(b) Explain Types of error committed in hypotheis testing.

(c) . Three factories manufacture widgets and the proportion of defective

widgets manufactured by A is 0.01 , by B is 004 and C is 0.02 respectively .
Factory A and B produce 30 % of widgets each while factory C produce 40 % of
widgets .
An upset customer returns a defective widget to the factory manager.
Use Bayes Theorem to assist the factory manager to arrive at the
probability of each factory producing a defective widget.

Q 3 Answer any 2 from below:

(a) Explain the assumptions to be satisfied by a good regression model

(b)   Following data gives the number of officers on duty and the waiting
time for customers. Find the regression of waiting time Y on number of
officers   on   duty X .

No of Officers	3	4	5	3	4
Waiting time (in minutes)	12	7	5	11	8

How long will a customer have to wait if there are 6 officers on duty
a particular day ?
(c) Explain applications of correlation.

Q 4 Answer any 2 from below: .

(a) Explain the concept with a scatter diagram .

(b) .   The following data gives the experience (X) in years of eight
machine operators and their performance ratings (Y) . Calculate
the coefficient of correlation between them and interpret it.

X	16	13	17	4	3	11	7	14
Y	88	87	89	72	70	82	78	84

(c) Explain Spearman's Rank correlation coefficient.

Q 5 Answer any 2 from below: .

(a)   Explain Mutually Exclusive and Independent events in probability with examples.

(b)   Shown below are the results of a national survey of 200 executives who were asked
to identify the geographic locale of their company and their   company's industry type.The
executives were allowed   to select one locale and one industry type.

	Northeast D	Southeast E	Midwest F	West G
Finance A	24	10	8	14
Manufacturing B	30	6	22	12
Communications C	28	18	12	16

(c) What is the probability that the respondent is from Midwest given he is from
Finance?

Q 6 . Answer any 2 from below: .

(a). Explain the principles of   good sampling .

(b) In a readymade garment cluster of SME units , 20 small enterprises were surveyed
to study their performance and its determinants.

Can we say that proportion of women owned enterprises and men owned
enterprises is different ? Test at 5 % level of significance,

Performance Category			
Gender	Low Growth	High Growth	Total
Male	7	3	10
Female	4	6	10
Total	11	9	20

(c) Explain sampling distribution of Means.

Q 7 . Answer any 2 from below: .

 (a) What is Chisquare test of significance?

 (b) A management consulting company presents a three seminar on project management to various clients. The seminar is basically the same each time it is given. However sometimes it is presented to high-level managers ,middle level managers and to low- level managers. Suppose the following data are some randomly selected evaluation. scores from different levels of   managers who attended the seminar .

       The ratings are on a scale of 1 to 10 with 10 being the highest. Test at 5% level of significance if there is difference in the evaluations according to manager level.

High level	Mid level	Low level
7	8	5
7	9	6
8	8	5
7	10	7
9	9	4
	10	8
	8	

(c) The following data shows brand preferred from different age group of customers,

	Brand A	Brand B	Brand C
Age group 1	24	34	25
Age group 2	28	39	18
Age group 3	39	47	36
Age group 4	22	9	54

Test at 5% level of significance if Brand preferred is independent of age group.