



UA-0694

Third Year B. Com. (Honours) Examination
February/March – 2012
BC 3.1 Advanced Statistics

Time : Hours]

[Total Marks : 70

Instructions :

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
T. Y. B. Com.

Name of the Subject :
BC 3.1 Advanced Statistics

Subject Code No. : **0 6 9 4** Section No. (1, 2,.....) : **NIL**

Seat No. :

Student's Signature

- (2) Attempt all questions.
(3) The figures to the right indicate full marks of the question.
(4) Statistical tables and graph papers would be supplied on request.

- 1 (a) Explain the following : 6
(i) Advantages of simple random sampling.
(ii) Two types of errors in testing of Hypothesis.
(b) From the production of an item on a particular 4
machine, a random sample of 1000 units was drawn. There are 32 units which are found defective. Hence the machine was repaired. After repairing another sample of 200 units from the production was drawn and 6 units found defective from them. Can we say that there is any improvement in the machine after repair ?
- 2 (a) The information regarding strata is given below : 4

Stratum	No. of observation	Stratum mean	Stratum variance
A	100	20	9
B	60	22	4
C	40	25	16

If stratified random sample is obtained by taking respectively 10, 6 and 4 observation from these strata. Find population mean and variance of the stratified mean.

- (b) The observation of a population are 1, 3, 5, 7. 6
How many random samples of size 3 can be taken from it ? Also verify the following results :

(i) $E(\bar{y}) = \bar{Y}$

(ii) $V(\bar{y}) = \left[\frac{N-n}{N} \right] \cdot \frac{S^2}{n}$.

- 3 (a) The following information gives the data of the marks obtained by the students of two classes in a college : 6
(i) Test the significance of the difference between two class means.
(ii) Test the significance of the difference between two class standard deviations :

Class	No. of students	Mean	S.D.
A	120	70	14
B	80	80	16

- (b) From the following data, take optimal decision under : 4
(i) Maxi-max rule
(ii) Maxi-min rule
(iii) Laplace rule
(iv) Harwitch's rule ($\alpha = 0.6$)

Action	Events		
	E_1	E_2	E_3
A_1	50,000	70,000	30,000
A_2	-20,000	10,000	60,000
A_3	40,000	40,000	40,000

- 4 (a) Write a short note on decision tree. 2
(b) The manufacturing cost of a product is Rs. 50 per unit and its selling price is Rs. 75.. If the unit is not sold during a week it becomes useless. The figures of weekly sales are given below : 8

Weekly demand	20	21	22	23
no. of weeks per sale level	300	300	750	150

Prepare a pay-off matrix. Find EMV and EOL for each act and hence obtain the optimum act.

- 5 (a) Write short note on O.C. curve. 4
 (b) For the double sampling plan [2000, 50, 100, 1, 4] with $P'=2\%$. Obtain ASN and ATI. 6
- 6 (a) If AQL = 2% and LTPD = 5% for the single sampling plan [1000, 100, 1], determine producer's risk and consumer's risk. 4
 (b) The range of 10 random samples each of size 5 were 14, 12, 11, 16, 13, 11, 12, 6, 8, 2, 6, 9. Find the control limits and state your comment about statistical control. 3
 (c) If the process fraction defectives is 0.06. Find the control limits for P-chart for sub group size 100. 3
- 7 (a) Write short note on Theory of runs. 2
 (b) The number of defective rivets in different planes is given below. Obtain the control limits for C-chart and also obtain revised limits : 8
 8, 16, 14, 19, 11, 15, 8, 11, 21, 12, 23, 16, 9, 25, 9, 9, 14, 11, 9, 10, 22, 7, 28, 9.
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