

	<b>Final-term EXAMINATION</b> <b>SEMESTER Fall 2004</b> <b>STA-301 Statistics and probability(Paper-1)</b>	<b>Total Marks:50</b> <b>Duration:120min</b>
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<b>Student ID / Login ID.</b>	
<b>Name.</b>	
<b>PVC Name /Code</b>	
<b>Date</b>	

**Maximum Time Allowed: (2 Hours)**

**Please read the following instructions carefully before attempting any of the questions:**

1. Attempt all questions. Marks are written adjacent to each question.
2. Do not ask any questions about the contents of this examination from anyone.
  - a. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.
  - b. If you believe that some essential piece of information is missing, make an appropriate assumption and use it to solve the problem.
  - c. Write all steps, missing steps may lead to deduction of marks.
3. You are allowed to use the calculator & Statistical tables in order to solve the questions. For your convenience we are providing you the following symbols,

$$\sum, \cap, \bar{X}, t_{\alpha/2}, t_{\alpha}, \beta_1, \beta_2, \infty, \alpha_1, \alpha_2, \alpha_3, \sigma^2, \sigma^2_1, \sigma^2_2, \sigma^2_3, \sigma^2_4, \sum x, \sum y, \sum xy, x^2, y^2, \int_{-\infty}^{+\infty}$$

**\*\*WARNING: Please note that Virtual University takes serious note of unfair means.**

**Anyone found involved in cheating will get an 'F' grade in this course.**

For Teacher's use only

Questions	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Marks								
Questions	Q9	Q10	Q11	Total				
Marks								

**Question No: 1**

**Marks:1**

If mean=median=mode then curve is symmetrical

- ☐ True  
☐ False

**Question No: 2**

**Marks:1**

Distribution Function is also called the step function

- ☐ True  
☐ False

**Question No: 3**

**Marks:1**

In the case of sampling with replacement as well as in the case of sampling without replacement, we have:

$$\mu_{\bar{x}} = \mu$$

- ☐ True  
☐ False

**Question No: 4**

**Marks:1**

The rejection region is also called the critical region.

- ☐ True  
☐ False

**Question No: 5**

**Marks:4**

Describe the continuous and discrete random variable with example.

**Question No: 6**

**Marks:4**

Define and describe the Least Significance Difference (LSD).

**Question No: 7**

**Marks:4**

Write down the properties of normal distribution

**Question No: 8**

**Marks:4**

Discuss on null and alternative hypothesis.

**Question No: 9**

**Marks:10**

Following is given the data of Traffic Density and Accident rate.

Traffic Density	30	35	40	45	50	60	70	80	90
Accident rate	2	4	5	5	8	15	24	30	32

- Plot the data on scatter dia-gram
- Calculate the correlation co-efficient between traffic density and accident rate
- Interpret the correlation.

**Question No: 10**

**Marks:10**

A continuous random variable X that can assume values between  $x=1$  and  $x=4$  has a density function given by

$$f_X(x) = \frac{1}{3}$$

- Show that the area under the curve is equal to 1
- Find  $P(1.5 < X < 3)$
- $P(X \geq 2.2)$

**Question No: 11**

**Marks:10**

Let X and Y be two discrete r.vs with the following joint p.d.

$\begin{matrix} x \\ y \end{matrix}$	2	4
1	0.1	0.15
3	0.2	0.30
5	0.1	0.15

Find  $EX$  and  $EY$ .