

(i) Printed Pages : 4 Roll No. ....

(ii) Questions : 9 Sub. Code : 

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Exam. Code : 

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NEP U.G. Common-Inter Disciplinary Course 2<sup>nd</sup> Sem.

(2056)

STATISTICS

Paper : Statistics - II

Time Allowed : 3 Hours]

[Maximum Marks : 60

**Note :-** There are **nine** questions in all. The first question is compulsory. There are two units, each carrying **four** questions. The candidate will be required to attempt **five** questions in all, including the compulsory first question and **two** questions from each Unit. A simple calculator with four basic mathematical operations is allowed.

**(Compulsory Question)**

1. Answer the following :

- (i) Differentiate between statistic and parameter.
- (ii) Define type-I and type-II errors.
- (iii) Discuss about simple and composite hypothesis.
- (iv) Write a note on F-distribution.
- (v) Write the ANOVA table for one-way classification.
- (vi) Mention the applications of chi-square distribution. 6×2

## UNIT—I

2. Discuss various types of probability and non-probability sampling techniques. 12
3. (a) Write the testing procedure for testing a single proportion in case of a normal population.
- (b) The means of two large samples of 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of standard deviation 2.5 inches? (Test at 5% level of significance). 6,6
4. (a) Define the following :
- (i) Null and Alternative hypothesis,
- (ii) One-tailed and two-tailed tests
- (b) Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favor of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are the same against that they are not, at 5% level of significance. 6,6
5. (a) Differentiate between population and sample. Why do we need sampling?
- (b) It is claimed that a random sample of 100 tyres with a mean life of 15269 kms is drawn from a population of tyres which has a mean life of 15200 kms and a standard deviation of 1248 kms. Test the validity of the claim at 5% level of significance and also find the confidence limits. 6,6

## UNIT—II

6. (a) Write the testing procedure to test the significance of the difference between two means in case of independent samples from two normal populations with small sample sizes and when the population variances are equal.
- (b) A random sample of 27 pairs of observations from a normal population gave a correlation coefficient of 0.6. Is this significant of correlation in the population at 5% level of significance? 8,4

7. (a) The time taken by workers in performing a job by method I and method II is given below :

**Method I** : 20 16 26 27 23 22

**Method II** : 27 33 42 35 32 34 38

Do the data show that the variances of time distribution from the population from which these samples are drawn do not differ significantly? (Given  $\alpha = 5\%$ )

- (b) Define the chi-square test for goodness of fit problem in detail. 6,6

8. (a) Below are given the gain in weights (in kgs.) of pigs fed on two diets A and B :

**Gain in weight**

**Diet A** : 25, 32, 30, 34, 24, 14, 32, 24, 30, 31, 35, 25

**Diet B** : 44, 34, 22, 10, 47, 31, 40, 30, 32, 35, 18, 21, 35, 29, 22

Test if the two diets differ significantly as regards their effect on increase in weight (Given  $\alpha = 5\%$ ).

- (b) Find the sampling distribution of a single sample mean in case of a normal population. 6,6

9. The following table gives the number of units of production per day turned out by four different types of machines :

Employees	Type of Machines			
	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
A	40	36	45	30
B	38	42	50	41
C	36	30	48	35
D	46	47	52	44

Using analysis of variance (a) test the hypothesis that the mean production is the same for four machines and (b) test the hypothesis that the employees do not differ with respect to mean productivity.

(Given  $\alpha = 5\%$ )

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