

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

SECOND YEAR

B.A./B.Sc. FOURTH SEMESTER (January – June) 2015

Mid-Semester Examination, March 2015

Date : 21/03/2015

STATISTICS (General)

Time : 12 noon – 1 pm

Paper : IV

Full Marks : 25

[Use a separate answer book for each group]

Group – A

1. Answer **any one** question :

[1×10]

- a) To examine the effects of pets and friends in stressful situations, researchers recruited 45 people to participate in an experiment. Fifteen of the subjects were randomly assigned to each of three groups to perform a stressful task alone (control group), with a good friend present, or with their dog present. Each subject's mean heart rate during the task was recorded. Test the appropriate hypothesis at $\alpha = 0.05$ level to decide if the mean heart rate differs between the groups. [Given, $F_{0.95, 42, 2} = 0.310565$]

	n (no of observation)	Mean	std. dev.
Control	15	82	9
Pets	15	73	9
Friends	15	91	8

where n = number of observations and std. dev = standard deviation (Please note the degrees of freedom in the calculation of std. dev is n = number of observations)

[10]

- b) A student analyzed data for a one-way analysis of variance situation for which there were 3 levels of the factor, and 21 people measured at each level. Unfortunately after running the analysis, the student lost the computer output. He said “All I remember is that one of the mean squares was 100 and the other one was 500, but I can't remember which was which. Oh, and I remember that the p-value of the test was 0.01.”

Based on the information, construct the ANOVA table.

[Some p-values corresponding to observed F Values (with d.fs 2 & 60 respectively) are given below to help you think :

[10]

F-value	P-value
0.9	0.41
1	0.37
2	0.14

Group – B

2. Answer **any three** questions :

[3×5]

- a) Discuss the advantages and disadvantages of sampling over complete enumeration. [5]
- b) What is sampling error and Non-sampling error in Sample Survey?
Discuss the different sources of Non-sampling error. [5]
- c) In Simple Random Sampling with replacement, give an unbiased estimator of population Total and find the Variance of the estimator. [5]
- d) In simple Random Sampling without replacement find an unbiased estimator of Population Mean and also find the variance of the estimator. [5]