GURUDAS COLLEGE

Internal Examination, 2020

B.Sc Part-I, STATISTICS (General)

Date: 11/12/2020

Time: 1 hr 30 mins **F.M-50**

1. Answer the following questions (**any four**) 2 x 4= 8

(a) For any two events A and B, P(A)=0.5 and P(A∩B) =0.2. Find the value of $P(A^c \cup B)$.

(b) If the random variable X assumes only two values -2 and 1 such that $2P(X = -2) = P(X = 1) = p$, find Var(X).

(c) Write the standard deviation and mode of a Poisson distribution with parameter $\frac{9}{4}$.

(d) What is the difference between primary and secondary data?

or

Write down one demerit of tabulation.

(e) Find the median of prime numbers between 21 and 50.

(f) The H.M. and G.M. of the two positive observations are 12 and 18 respectively. Find their A.M.

or

What is scatter diagram?

2. Answer the following questions (**any three**) 14 x 3= 42

a. (i) Suppose two variables x and y are related as y = a +bx, where a and b are constants and $b \neq 0$. Find a relation between standard deviation of y and that of x.

(ii) Obtain first four central moments in terms of raw moments.

(iii) The mean age of a group of 20 girls is 15 years and that of a group of 25 boys is 24 years. If the two groups are taken together to form a new group, what is the mean age of this group? 3+6+5

b. (i) Derive Spearman's Rank Correlation coefficient for no tie case. (iii) Explain the following terms (**any two**):

Correlation index, Multiple correlation coefficient, Leptokurtic distribution. 7+7

c. (i) State and prove Bayes' Theorem.

(ii) A school in a city sends up three teams A, B and C for a quiz competition which contain respectively 2 girls, 3 boys; 4 girls ,5 boys and 3 girls ,5 boys. One student is chosen at random for any of the three teams. If the student is a girl, find the probability that she is from team C. 7+7

d. (i) Obtain the recurrence relation for central moments for a binomial distribution.

(ii) For a Normal distribution with mean μ and variance σ^2 show that

$\mu_{2r} = (2r-1)(2r-3)\ldots\ldots 3.1 \quad \sigma^{2r}$ 7+7