University of Sargodha

M.A/M.Sc Part- II/Composite, 1st-A/2014

Mathematics:IX Mathematical Statistics

Maximum Marks: 100 **Time Allowed: 3 Hours**

Note: **Objective part is compulsory. Attempt any four questions from subjective part.**

Objective Part (Compulsory) (2*10=20)

Q. 1: Write short answers of the following in two lines each on the answer book.

1) Mutually exclusive events **2)** Exhaustive events **3)** Sample space **4)** Probability distribution **5)** Classical definition of probability **6)** Random experiment **7)** Regression **8)** Sampling frame **9)** Any two properties of correlation coefficient **10)** Method of Least square

Subjective Part (20*4=80)

Q. 2: a) Define Total probability theorem and Bayes Rule. (05, 15)

b) Derive formula for moment generating function of Binomial distribution and find its mean and variance.

Q. No.3: Provide normal probability distribution and show that it is a complete probability distribution. (20)

Q. No.4: Define Hypergeometric experiment and its properties. (5, 15)

b) Show that the mean of Chi-square distribution is equal to its parameter.

Q. No.5: Differentiate with replacement sampling and without replacement sampling. (5, 15)

b) Define the *t*-distribution and write down its different properties.

Q. No.6: Prove that mean and variance of Poisson distribution are equal. (20)

Q. No.7: The grades of a class 9 student on a midterm report (x) and on the final examination (y) are as follows: (10, 10)

Midterm Grade	77	50	71	72	81	94	96	99	67
Final Grade	82	66	78	34	47	85	99	99	68

i) Find the correlation coefficient between midterm grade and final exam grade.

ii) Fit a regression line y on x.