

**FACULTY OF SCIENCE**  
**B.Sc. II-Semester (CBCS) Examination, May/ June 2017**

**Subject : Statistics**

**Paper – II : Probability Distributions**

**Time : 3 Hours**

**Max. Marks: 80**

**Section - A (5x4=20 Marks)**  
**(Short Answer Type)**

- 1 Derive mean for Binomial distribution.
- 2 Define Negative Binomial random variable. Derive its m.g.f.
- 3 State and prove reproductive property for Poisson random variables.
- 4 Define Geometric random variable. State and prove its memory-less property.
- 5 Define Rectangular distribution. Derive its variance.
- 6 Define Normal distribution. Explain its Area property with the help of an example.
- 7 What is Exponential distribution? Derive its cumulant generating function.
- 8 Define Cauchy distribution state and prove its additive property.

**Section - B (4x15=60 Marks)**  
**(Essay Answer Type)**

- 9 (a) Stating the assumptions show that Poisson distribution is a limiting case of Binomial distribution.  

**OR**

 (b) Derive cumulant generating function for Poisson distribution and hence find  $\beta_1$  &  $\beta_2$  also comment on skewness and Kurtosis of Poisson distribution.
- 10 (a) Define hypergeometric distribution. Show that hypergeometric distribution tends to binomial distribution.  

**OR**

 (b) Stating the assumptions show that Poisson distribution is a limiting case of negative Binomial distribution.
- 11 (a) Show that in case of Normal distribution  
 $S.D. : M.D. : S.D. :: 10 : 12 : 15$   

**OR**

 (b) Define Gamma distribution. Obtain its m.g.f. and hence obtain its mean and variance.
- 12 (a) Define Exponential distribution. Define its m.g.f. and hence find  $\beta_1$  &  $\beta_2$ . Comment on the shape of Exponential distribution.  

**OR**

 (b) Show Normal distribution as a limiting case of  
 (i) Binomial distribution  
 (ii) Gamma distribution

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