STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2011 – 12 & thereafter)

SUBJECT CODE: 11MT/PC/MS34

M. Sc. DEGREE EXAMINATION, NOVEMBER 2014
BRANCH I - MATHEMATICS
THIRD SEMESTER

COURSE : CORE
PAPER : MATHEMATICAL STATISTICS
TIME : 3 HOURS **MAX. MARKS : 100**

SECTION- A **(5 x 2 =10)**
ANSWER ALL QUESTIONS

1. Write any two properties of characteristic function.
2. Find the moments of zero-one distribution.
3. Define stochastic convergence.
4. Define student's t-distribution.
5. Define unbiased estimate.

SECTION- B **(5x6=30)**
ANSWER ANY FIVE QUESTIONS

6. Obtain the central moment of second order μ_2 of a Poisson random variable
7. Define Beta distribution and obtain its moments.
8. State and prove Bernoulli's law of large numbers.
9. Explain chisquare test of independence by contingency table.
10. Estimate the parameter λ of Poisson random variable by the method of maximum likelihood.
11. If the characteristic function of random variable X is $\varphi(t) = e^{-t^2/2}$ obtain its density function.
12. State and prove Chebychev's Law of Large Number.

SECTION- C **(3x20=60)**
ANSWER ANY THREE QUESTIONS

13. State and prove Levy's theorem that uniquely determines the distribution function from the characteristic function.
14. Define Cauchy distribution and obtain its characteristic function. Prove that addition theorem is valid.
15. State and prove Levy-Cramer theorem.
16. Derive chisquare distribution.
17. State and prove Rao-Cramer inequality.

▲▲▲▲▲▲▲▲▲▲