M 9981

Reg. No. : .....

Name : .....

IV Semester B.A./B.Sc./B.Com./B.B.A./B.B.A. T.T.M./B.B.M./B.C.A./B.S.W. (CCSS-Regular) Degree Examination, March 2011

STATISTICS (Core Course)

4B04 STA : Probability Distribution

Time : 3 Hours Max. Weightage : 30

Instruction : Use of calculators and statistical tables are ***permitted.***

PART – A **Weightage 1 each**

Answer **any ten** questions.

1. If X follows Poisson distribution with mean = 4, what is its coefficient of variation?
2. The mean and variance of a binomial variate are 16 and 8 respectively. Find P(X = 0).
3. Define Gamma distribution.
4. State Jenson's inequality.
5. If X and Y are independent normal variate with means μ_1 and μ_2 and variances σ_1^2 and σ_2^2 respectively, then what is the distribution of X + Y.
6. Define negative Binomial distribution.
7. State Cauchy-Shewart's inequality.
8. Define convergence in probability.
9. What is the mean of a Cauchy distribution ?
10. What is simulation ?
11. A R.V. X has mean = 6 and variance = 5. What is the upper limit of $P\{|X - 6| > 5\}$?

P.T.O.

PART – B

Weightage 2 each

Answer **any six** questions.

12. If X and Y are Poisson variates such that $P(X = 1) = P(X = 2)$ and $P(Y = 2) = P(Y = 3)$, find $V(X - 2Y)$ if X and Y are independent.

13. If a random variable X is uniformly distributed over $(-\theta, \theta)$, find its m.g.f. and hence find its variance.

14. Suppose an unbiased coin is tossed 100 times. Find approximate probability that the number of heads will be between 30 and 70.

15. If X follows Binomial distribution with parameters n and p, find its mode.

16. If X is a normal variable with mean = 20 and standard deviation = 5, find $P(16 \leq X \leq 22)$.

17. If X and Y are independent Poisson variates, find the conditional distribution of X given X + Y.

18. Derive the moment generating function of geometric distribution and hence derive its mean.

19. If X_i is a R.V. which assumes the values – i and + i with equal probability, examine whether weak law of large number hold.

20. How will you generate a geometric R.V. in simulation ?

PART – C

Weightage 4 each

Answer **any two** questions.

21. State and prove Tchebychev's inequality.

22. For a normal distribution with parameters μ and σ find the quartile deviation.

23. Find the characteristic function of Poisson distribution with parameter λ and hence find β_1.

24. If X and Y are independent gamma variates with parameters μ and β respectively, find the distribution of X given X + Y.
