



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./
B.A. Afsal UI Ulama Degree (CCSS – Reg./Supple./Improv.)

Examination, April 2012

CORE COURSE IN STATISTICS
4B 04STA : Probability Distribution

Time : 3 Hours

Max. Weightage : 30

Instruction : Use of calculators and statistical tables are permitted.

PART – A

Answer any ten questions :

(Weightage 1)

1. If a R.V. X follows uniform distribution over $(-1, 1)$ What is its mean ?
2. If a R.V. X follows B.D. $(6, p)$ and if $P(X = 2) = 9 P(X = 4)$ find p.
3. What is mean of a geometric distribution with parameter P.
4. If the m.g.f. of a R.V. X is given by $M_x^{(t)} = e^{10t+2\sigma^2}$ find variance of X.
5. State Cauchy-Schwart's inequality.
6. If X is a R.V. such that $E(X) = 3$ and $E(X^2) = 13$. Find $P\{|X - 3| < 5\}$
7. State central limit theorem.
8. If X follows $N(0, 1)$, what is the distribution of X^2 .
9. Define convergence in probability.
10. What is the coefficient of variation of Poisson distribution with parameters λ ?
11. What is simulation ?

(10x1=10)

PART – B

Answer any six questions from Part B.

(Weightage 2 each)

12. If X has discrete uniform distribution over $1, 2, \dots, n$, find its mean and variance.
13. Find the distribution of the sum of identically and independently distributed R.Vs. following geometric distribution.

$E(X_i) = \frac{1}{p}$
 $V(X_i) = \frac{1-p}{p^2}$
 $\sum X_i \sim \dots$
 P.T.O.



14. State and prove the additive property of Poisson distribution.
15. If X follows normal distribution with mean = 12 and variance = 2, find $P(9.8 < X < 13.8)$.
16. State the properties of normal distribution.
17. For a Binomial distribution mean = 4 and variance = 3, find its mode.
18. If the p.d.f. of a R.V. X is $f(x) = e^{-x}; x > 0$ find $P(|x - 2| > 2)$ by Tchebyshev's inequality.
19. State and prove Bernoulli's law of large numbers.
20. How will you generate a geometric random variable in simulation? (6x2=12)

PART - C

Answer any 2 questions.

(Weightage 4 each)

21. State and prove Tchebyshev's inequality.
22. Stating the conditions clearly, prove that Poisson distribution is the limiting form of Binomial distribution.
23. For a normal distribution 31% of the items are below 45 and 8% are above 64. Find the mean and standard deviation of the distribution.
24. a) Derive the m.g.f. of Gamma distribution. Hence find its mean and variance.
b) Find the distribution of the sum of two independent Gamma variates with parameters p_1 and p_2 . (2x4=8)