

Mid-West University
Examinations Management Office

Final Examinations-2079

Bachelor level/ B.Sc / 2nd Semester

Full Marks: 60

Time: 3 hours

Pass Marks: 30

Subject: Probability Theory (STA425/325)

Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.

Group A

Long answer question (Attempt all) [4x6=24]

- 1) Derive Binomial distribution, as a limiting case of hyper geometric distribution.
- 2) Prove that $\mu_{r+1} = \lambda \left(r\mu_{r-1} + \frac{d\mu_r}{d\lambda} \right)$
- 3) Find mean and variance of hyper geometric distribution.
- 4) Derive poisson distribution as limiting case of binomial distribution.

OR

Find the MG F and variance of Negative binomial distribution.

Group B

Short answer question (Attempt all) [6x4=24]

- 5) Show that in a Poisson distribution with unit mean and mean derivation about mean is $(2/e)$ times the standard deviation.
- 6) The pdf of a random variable x is given $f(x) = Kx^2$, $0 \leq x \leq 2$. Find the probability that; (a) $x \geq 1$ and (b) x lies between 0.5 & 1.5.
- 7) State and prove Baye's theorem.
- 8) Write the chief characteristics of Normal distribution
- 9) Describe uniform distribution. Also find its mean and variance.
- 10) Find the mean and variance of Geometric distribution.

OR

Find mean deviation about mean of normal distribution.

Group C

Very Short answer question (Attempt all)

[6x2=12]

- 11) Discuss the Hyper geometric distribution.
- 12) Define Rectangular distribution.
- 13) Define classical definition of probability.
- 14) State multiplicative law of probability.
- 15) Given that $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{4}$, $P(A/B) = \frac{1}{6}$ find $P(B/A)$
- 16) Write down two properties of Binomial distribution.

THE END