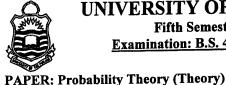


- VII. The experiment is repeated a variable number of times until to obtain a first success is called a.....
  - a. Hypergeometric experiment
  - b. Geometric experiment
  - c. Bernoulli experiment
  - d. Negative binomial experiment
- VIII. The shape of the Poisson distribution depends on its ......;
  - a. Parameter
  - b. variance
  - c. sample size
  - d. x values
  - IX. The Poisson distribution tends to be symmetrical as ..... becomes larger and larger.
    - a. µ
    - b. n
    - c. p
    - d. , theoretical values
  - X. In which distribution variance is greater than its mean?
    - a. Geometric
    - b. Poisson
    - c. multinomial
    - d. negative binomial
    - e. discrete uniform

## UNIVERSITY OF THE PUNJAB Fifth Semester - 2019

Examination: B.S. 4 Years Program



**Course Code: STAT-307** 

MAX. TIME: 2 Hrs. 45 Min. MAX. MARKS: 50

## ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Write short answer on the following questions. Q.2

Part – II

(20)

Roll No. .....

- Describe the classical, relative frequency, and subjective concepts of probability. a)
- If P(A) = 0.3, P(B) = 0.4, and P(A and B) = 0.2, are A and B independent. b)
- How does conditional probability relate to the concept of independence? c)
- Differentiate between independent and mutually exclusive events. Are independent d) events mutually exclusive?
- Find the probability of being dealt a bridge hand of 13 cards containing 5 spades, 2 e) hearts, 3 diamonds and 3 clubs.
- When flipping an unbiased coin, determine the probability that the 7<sup>th</sup> head occurs on f) the 13th trial.
- In Bayes theorem, how does the prior probability differ from the revised probability? g)
- Describe the significance of moments in probability distribution. h)
- What is the meaning of the expected value of a probability distribution? i)
- What are the four properties that must be present in order to use Poisson distribution? j)
- Q.3.a) A patient is thought to have one of three diseases A, B and C, whose probabilities under given conditions are 0.5, 0.3 and 0.2 respectively. A test is carried out to help the diagnosis and it yields a positive result with a probability of 0.1 for disease A, a probability of 0.2 for disease B and a probability of 0.9 for disease C. The test is conducted 6 times and the results are positive 4 times and negative twice. What is the probability of each disease after testing?
  - b) A bag contains 3 red 5 black balls and another 4 red and 7 black balls. A ball is drawn from a bag selected at random. Find the probability that it is red.

(7+3)

Compute the probability generating function, cumulants, factorial cumulants, 0.4 coefficient of skewness and kurtosis of negative binomial distribution.

(10)

- O.5.a) Describe the geometric experiment and show that its mean greater than its variance. b) The probability that a person will install a black phone in a residence is estimated
  - to be 0.3. Find the probability that the  $10^{th}$  phone installed in a new subdivision is the 1st black phone.
  - c) Determine the probability that the income tax authorities will catch 3 income tax returns with illegitimate deductions, if it randomly selects 6 returns among 20 income tax returns of which 8 contain illegitimate deductions.

(4+3+3)