**Assignment No.2 (Course STA 301)**

**FALL 2020 (Total Marks 20)**

**SOLUTION**

**BC180205164**

**Assignment # 1 (Lecture 23-28)**

**Question 1: Marks: 10**

A and B pay a game in which A’s probability of wining is 2/3. In a series of 8 games, wat is the probability that A will win

1. Exactly 4 games

SOLUTION

P=2/3

Q=1-p

1-2/3

3-2/3

Q=1/3

P(X=4)=

P(X=4)=70(16/81)X(1/81)

P(X=4)=1120/6561

P(X=4)=0.17

At least 4 games

SOLUTION:

P(X≥4)=P(4)+P(5)+P(6)+P(7)+P(8)

P(X=5)=

P(X=5)=56(32/243)X(1/27)

1792/6561

P(X=5)=0.27

P(X=6)=

P(X=6)=28(64/729)X(1/9)

1792/6561

P(X=6)=0.27

P(X=7)=

P(X=6)=8(128/2187)X(1/3)

1024/6561

P(X=7)=0.15

P(X=8)=

P(X=8)=256/6561

P(X=8)=0.03

P(X≥4)= 0.17+0.27+0.27+0.15+0.03

P(X≥4)=0.91

1. 6 or more games

SOLUTION

P(X≥6)=P(6)+P(7)+P(8)

0.27+0.15+0.03

0.46

1. From 3 to 6 games

SOLUTION

P(3≤x≤6)=P(3)+P(4)+P(5)+P(6)

P(3)=

P(3)=0.06

0.06+0.17+0.27+0.27

0.78

**Question 2: Marks: 10**

An urn contains 4 red balls and 6 black balls. A sample of 4 balls is selected from the urn without replacement. Let X be the number of red balls contained in the sample, then find the probability distribution for X.

P(X=0)=

P(X=0)=0.07142

P(X=1)=4\*20/210

P(X=1)=0.3809

P(X=2)=6\*15/210 = 0.4285

P(X=3)=4\*6/210 = 0.1142

P(X=4)=1\*1/210 = 0.0047