Q1 (pts) A hospital spokesperson reported that 4 births had taken place at the hospital during the last 24 hours. We consider only the gender of these four children, recording M for a male child and F for a female. There are 16 gender combinations possible.

(a)List these 16 outcomes in terms of simple events beginning with E_1 as (FFFF)

(b)Define following events in term of simple events

A: No girl is born, B: Two boys and two girls are born,

C: At least one girl is born D :Three boys and one girl is born.

(c) Find $P(A \cap B)$, $P(B \cap C)$, $P(A \cup D)$ and $P(C)^c$

(d) Calculate $P(A \mid C)$ and $P (D \mid C)$.

Q2 (pts) Fill in the blanks for given table

P(A)	P(B)	Conditions for events A and B	$P(A \cap B)$	P(AUB)	P(A | B)
.3	.4	mutually exclusive			
.3	.4	Independent			
.1	.5			.1	
.2	. 5		0		

Q3 (pts) Given sample space S = { E_1 , E_2 , E_3 , E_4 , E_5 , E_6 , E_7 }
Event A = { E_1, E_3 , E_5, E_7 } Event B= { E_2 , E_3 ,E_4 ,E_5 }
Draw two Venn diagrams for (a) A B (b) B^c . Shade the desired area,
Indicating positions of all elements.

Q4(pts) Let X be a discrete random variable with a probability distribution given as

X	-2	-1	0	1
P(x)	1/9	1/9	4/9	-

(a) Find P(1) (b) Find mean =E(X) (c) Find standard deviation of X

Q5 (pts) Suppose a particular set of symptoms denoted as event H, occurs only when any one of these illnesses A, B or C occurs. Assume that illnesses A, B, and C are mutually exclusive.

Studies show these probabilities of getting the three illnesses

P(A) =0.01 , P(B)=0.005 P(C)= 0.02. the probabilities of developing the symptoms H, given a specific illness P(H | A) = 0.90 , P(H | B) = 0.95 , P(H| C) = 0.75 , assuming that an ill person shows the symptoms . What is the probability that person has illness A. What is the probability that person has illness C.

Q6 A Sociologist s interested in drawing a random sample of six individuals from a group

Consisting

of 9 males and 8 females.

(a) How many different samples of size 6 are possible?

(b)How many samples would consist of all males ?

(c) How many sample would consist of 3 males and 3 females

(d) Find the probability that the sample contains three male and 3 females.

Q7 (pts) Let X be a Binomial random variable with n =7 and p = 0.3, Find these values
(a) P(x=4) , (b) P (x 1), (c) P(x 1), (d) mean (e) standard deviation