Homework SS: General Discrete Probability Models

Due: Day of TEST #2

Name:

Show your work for each problem when appropriate.

1) Suppose that you are offered the following deal: You roll a die. If you roll a 6, you win \$10. If you roll a 4 or 5, you win \$6. If you roll a 1, 2, or 3, you pay \$4. If the random variable X is the amount of winnings, list the values that X may take on.

2) A theater group holds a fundraiser. It sells 100 raffle tickets for \$6 apiece. Suppose you purchase 4 tickets. The prize is 2 passes to a Broadway show, worth a total of \$150.

(a) Define the random variable X, what you are ultimately interested in.

(b) List the values that X may take on.

3) Suppose that the PDF for the number of years it takes to earn a Bachelor of Science (B.S.) degree at a certain university is given below.

x	$P(X = x)$
3	0.15
4	0.65
5	0.10
6	0.05
7	0.05

(a) In words, define the random variable X.

(b) What does it mean that the values 0, 1, and 2 are not included for X on the PDF?

(c) If a student is randomly selected, find the probability that it would take them *at least* 4 years to graduate.

4) Six different dice are rolled. If we are interested in the number of dice that show a "3," what values can X take on? Choose one answer.

(a) $X = 3$
(b) $X = 1, 2, 3, 4, 5, 6$
(c) $X = 2, 4, 6$
(d) $X = 0, 1, 2, 3, 4, 5, 6$

5) Suppose that about 85% of graduating students attend their graduation. A group of 23 graduating students is randomly chosen and asked if they planned to attend.

(a) In words, define the random variable X.

(b) What values can X take on? Choose one answer.

(i) $X = 0, 1, 2, \ldots, 21, 22, 23$
(ii) $X = 0, 1, 2, \ldots, 83, 84, 85$
(iii) $X = 1, 2, 3, \ldots, 83, 84, 85$
(iv) $X = 1, 2, 3, \ldots, 21, 22, 23$

6) The probability distribution for DVD rentals per customer at Video To Go is given below. The rental store does not allow customers to rent more than five DVDs per visit.

Video To Go						
x	0	1	2	3	4	5
$P(X = x)$	0.05	0.52	0.24	?	0.07	0.04

(a) In words, define the random variable X.

(b) Find the probability that a customer at Video To Go rents three DVDs.

(c) Find the probability that a customer at Video To Go rents *at least* three DVDs.

(d) Find the probability that a customer at Video To Go rents *at most* four DVDs.