Math 4441: Probability and Stochastic Processes

Quiz – 2: Discrete Random Variables

Time: 30 Minutes Full Marks: 30

1.	In an urn, there are 10 red balls and 15 green balls. Suppose you pick three balls at a time. If all the balls that you picked are not red, then you put the balls back in the urn and continue the same procedure again (i.e., you pick three balls again and check whether they are **red** or not). In contrast, if you find all the balls are **red**, then you stop.	10
	If Xrepresents, the number of times you pick the balls to get three red **balls**, find the PMF of red.	
2.	A college mathematics department sends 1 professors to the annual meeting of the Mathematical Society, which lasts five days. The hotel at which the conference is held offers a bargain rate of x dollars per day per person if reservations are made 45 or more days in advance, but charges a cancellation fee of $2x$ dollars per person. The department is not certain how many professors will go. However, from the past experience it is known that the probability of the attendance of i professors is 1/5 for i=8, 9, 10, 11,and 12. If the regular rate of the hotel is $2x$ dollars per day per person, should the department make any reservations so that the average cost will be minimum? If so, how many?	10
3.	A fair coin is flipped repeatedly. What is the probability that the fifth tail occurs before the tenth head?	10