SCS 3107 – Probability and Statistics

Tutorial 4

1. The random variable X has a normal distribution with mean 20 and variance 16. Find the probability that $X > 22$.

2. The heights of boys at a particular age follow a normal distribution with mean 150.3 cm and standard deviation 5cm. Find the probability that a boy picked at random from this age group has a height

   (i) less than 153 cm
   (ii) more than 144 cm

3. Three coins are thrown. If one head turns up, Rs1.00 is paid. If two heads turn up, Rs 3.00 is paid , and if three heads turn up Rs 5.00 is paid If the game is to be considered as fair what should be the penalty if no heads turn up?

4. Marks of 100 students in an examination are normally distributed with mean of 65 and variance 225.
   (i) Given the pass mark is 50, estimate the number of students who have passed the examination.
   (ii) If a student obtained a mark '**x**' or above they are eligible for a merit certificate. If there were 8% of students who obtained merit certificates find the value of **x**.

5. A discrete random variable X can assume values 10 and 20 only. If E(X)=16, write the p.d.f.(probability distribution function) of X in the table form.

6. Toss an unbiased coin until either two heads or two tails (no need to be consecutively) have been occurred. You have to pay Rs 6.00 to start and receive Rs 5.00 for every head observed. Find the expected amount you get.

7. A soft-drink vending machine is set so that the amount of drink dispensed is a random variable with a mean of 200ml and standard deviation of 15ml. what is the probability that the average amount dispensed in a random sample of size 36 is at least 204 ml?

8. If X is normally distributed with mean 3 and standard deviation 0.5, and $P(3 < X < C) = 0.4656$, find the value of C.