Statistics DA 3

Name: Kulvir Singh

Reg. No. : 19BCE2074

Q1. Let X be the number of heads in 10 tosses of a fair coin.

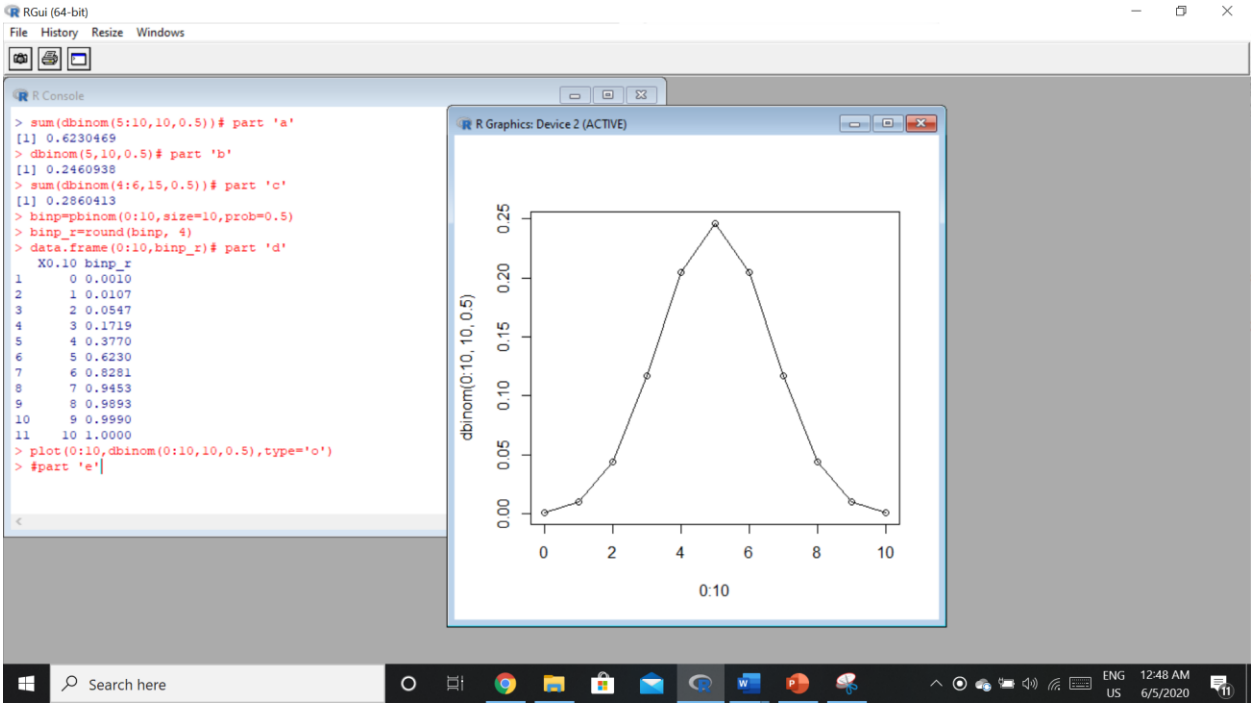
(a) Find the probability of getting at least 5 heads.

(b) Find the probability of getting exactly 5 heads.

(c) Find the probability of getting between 4 and 6 heads, inclusive.

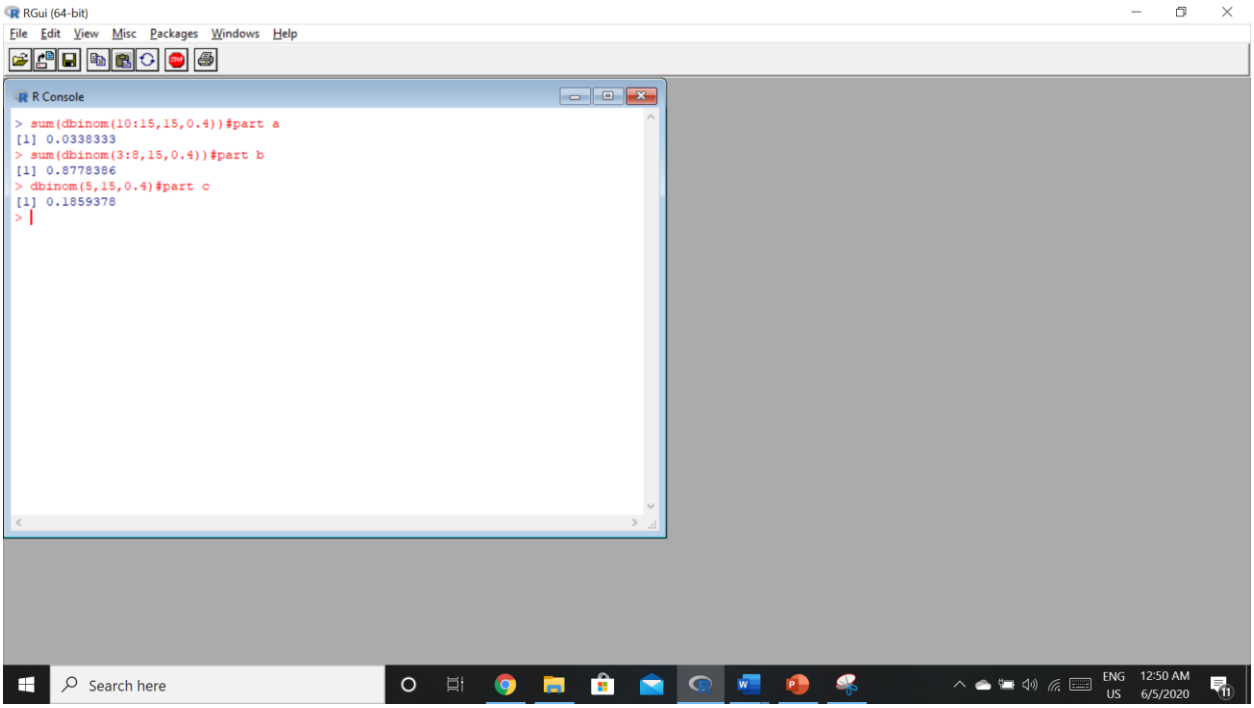
(d) Find the probability of whole space and display those probabilities in a table.

(e) Show the shape of this Binomial distribution.



Q2. The probability that a patient recovers from a corona disease is 0.4. If 15 people are known to have contracted this disease, what is the probability of Binomial (15, 0.4) distribution that

(a) at least 10 survive, (b) from 3 to 8 survive, and (c) exactly 5 survive.



Q3. Suppose our random variable X is Poisson distribution with $\lambda = 12.33$.

(a) Find the probability of 15 or fewer occurrences $P(X \leq 15)$.

(b) Find the probability of EXACTLY 6 occurrences $P(X = 6)$.

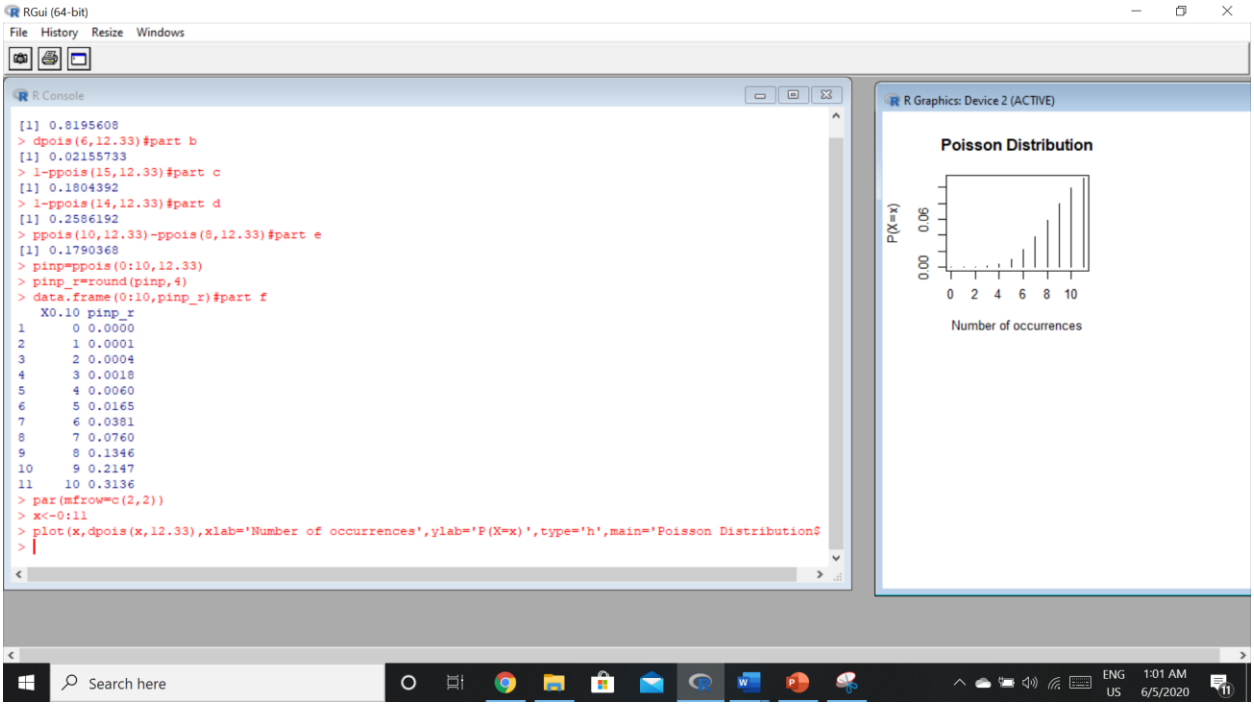
(c) Find the probability of more than 15 occurrences $P(X > 15)$.

(d) Find the probability of 15 or more occurrences $P(X \geq 15)$.

(e) Find the probability of 8, 9, or 10 occurrences $P(8 \leq X \leq 10)$.

(f) Make a table of the first 11 Poisson probabilities and cumulative probabilities when $\lambda = 12.33$ and make the output prettier.

(g) Plot the probabilities and put some labels on the axes with the title of graph.



Q4(i). Find (i) $P(0.8 \leq Z \leq 1.5)$ (ii) $P(Z \leq 2)$ (iii) $P(Z \leq 1)$.

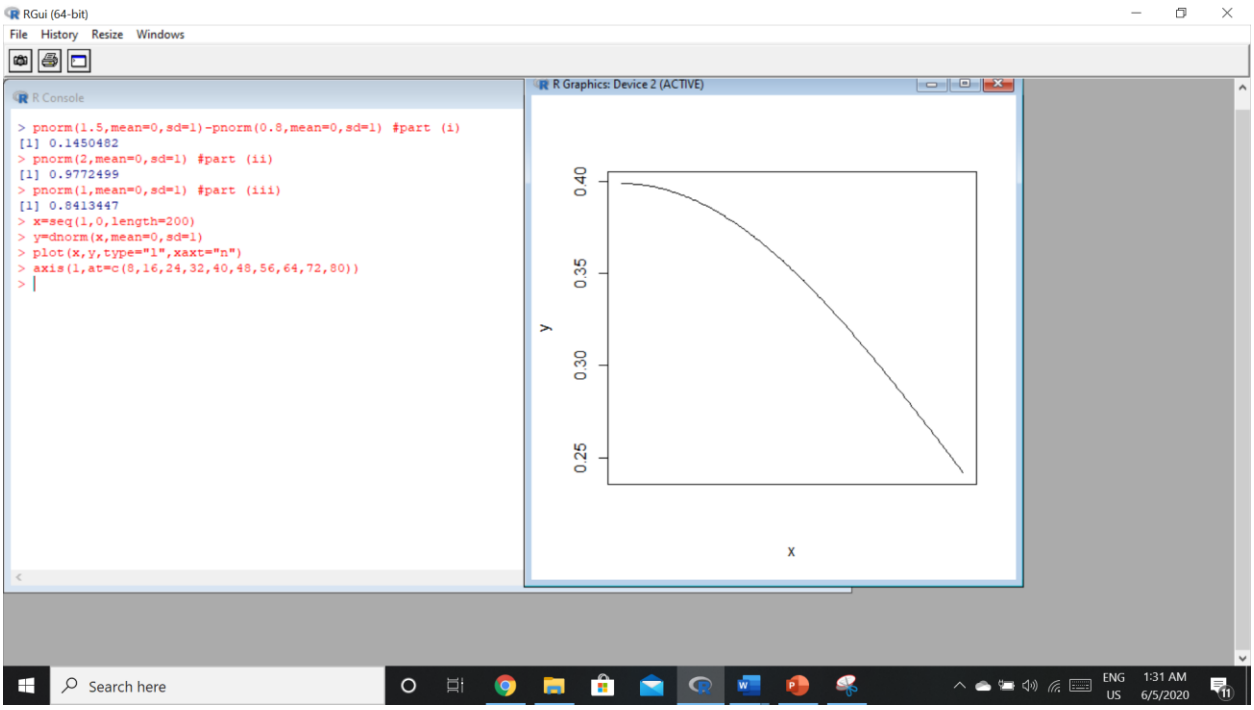
Find these probability values (standard normal distribution) and Plot the graph with text.

Q4(ii). If mean is 70 and Standard deviation is 16

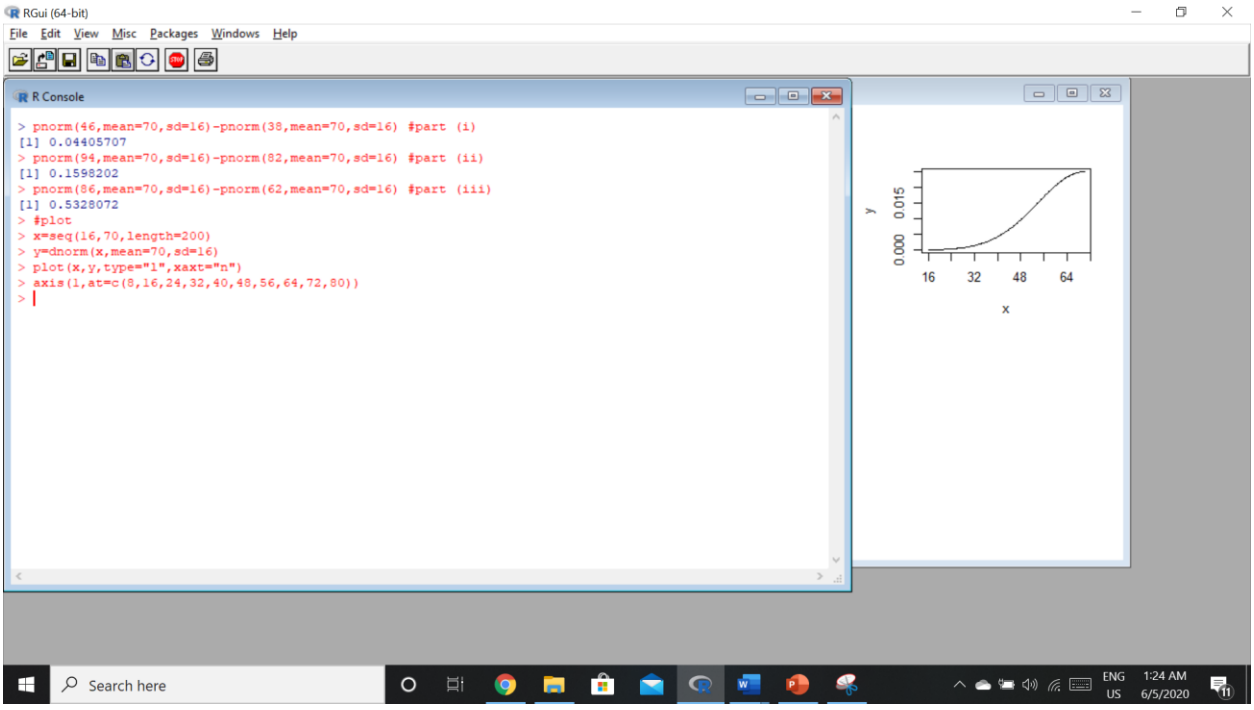
(i) $P(38 \leq X \leq 46)$ (ii) $P(82 \leq X \leq 94)$ (iii) $P(62 \leq X \leq 86)$.

Find the Probability values (general normal distribution) and Plot the graph with text.

Part i>



Part ii>



Q5. 1000 students had written an examination, the mean of test is 35 and standard deviation is 5. Assuming the distribution to be normal then find and plot the graph of the following:

(i) How many students marks lie between 25 and 40.

(ii) How many students get more than 40.

(iii) How many students get below 20.

(iv) How many students get 50.