qnance

QUANT TEST

Time Limit : 40 minutes

Maximum Score : 20

SECTION 1: (6 points)

1. Given an 11X11 symmetric integer matrix. Let us say each column has numbers from 1 to 11. Let P be the probability that the diagonal has all the numbers from 1 to 11. Which option is true?

a) P < 0.1

b) 0.1 <= P < 0.5

c) 0.5 <= P < 0.9

d) P >= 0.9

2. Let us say we select three real numbers in the range 0 to 1. What is the probability that it is possible to form a triangle with these three values as the side lengths?

a) 1/2

b) 1/4

c) 3/4

d) 1/8

3. Three points are marked on a circle. What is the probability that all points lie in semi-circle?

a) 1/4

b) 1/2

c) 3/4

d) 3/8

4. Suppose you could take all samples of size 64 from a population with a mean of 12 and a standard deviation of 3.2. What would be the standard deviation of the sample means?

a) 3.2

b) 0.2

c) 0.3

d) 0.4

5. Failing to reject the null hypothesis when it is false is:

a) alpha

b) Type I error

c) beta

d) Type II error

6. A dice is rolled continuously until we get two 6. What is the expected number of rolls? (1 point)
a) 6
b) 12
c) 18
d) 24

SECTION 2 (14 points):

A. Bob enters a game show where he is given 'n' closed boxes. Only one of the box contains the grand prize and only the game host knows which box it is. Bob is initially asked to choose one of the box. The
host then opens one of the other boxes which does not contain the prize. He then asks Bob if he wants to choose one of the remaining (n-1) boxes, or stick to his original pick. What is the probability of winning in each case in terms of n? (6 points)

B. Consider an n*n grid. Bob is standing at the top left corner of the grid. He wants to reach the bottom right corner. However he is only allowed to move either Right or Down.

a. Count the number of ways to reach the destination (1pt)

b. Count the number of ways to reach the destination given that the first and the last moves should be same (1pt)

c. Count the number of ways to reach the destination given that Bob is not allowed to cross the straight diagonal line joining top left and bottom right corner (6pts)

Please provide closed form solutions in terms of n