**Quiz 1**

Total time : 35 minutes

Total marks : 25

MCQ questions may have more than one correct answer

Q1. Draw box and whisker plot for the given data: [2 mark]

54,70,60,65,73,67,69,72,75,66,76

Use the data below for Q2 - Q4

|  |  |
| --- | --- |
| X | Y |
| 1 | 2 |
| 2 | 4 |
| 3 | 5 |
| 4 | 4 |
| 5 | 5 |

Q2. Calculate linear regression using least square method for given data. [1.5 mark]

Q3. What is R-squared or coefficient of determination of given data. [1.5 mark]

Q4. What is covariance of given data. [1 mark]

Q5. Which one is correct formula for calculation of slope in linear regression [1 mark]

1. Covariance(X,Y) / Variance(X)
2. Mean(X\*Y) / Variance(X)
3. Covariance(X,Y) / StdDeviation(X)
4. Mean(X\*Y) / StdDeviation(X)

Q6 : If we pick five numbers uniformly at random from the set {1,2,3,....100} without repetitions, what is the probability that every number picked is strictly less than the previous number?

[2 mark]

Q7 : In the Monty Hall problem, there were 2 goats and 1 BMW car. Now consider that there are k goats and 1 car. What will be the new probability of winning the car if you play optimally. What will it be otherwise? [2 mark]

Q8. What is P(ABC)? [1 mark]

A. P(A) \* P(B) \* P(C)

B. P(A|BC) \* P(B|C) \* P(C)

C. P(A|B) \* P(B|C) \* P(C)

D. P(B|AC) \* P(A|C) \* P(C)

Q9. There are three cards. The first is green on both sides, the second is red on both sides and the third is green on one side and red on the other.We choose a card at random and we see one side (also chosen at random). If the side we see is green, what is the probability that the other side is also green? [2 mark]

Q10. Let C and D be two events with P(C) = 0.25, P(D) = 0.45, and P(C ∩ D) = 0.1.

What is P(∩ D)? (where,is complement of C) [2 mark]

Q11. Suppose you are taking a multiple-choice test with c choices for each question. In answering a question on this test, the probability that you know the answer is p. If you don’t know the answer, you choose one at random. What is the probability that you knew the answer to a question, given that you answered it correctly? [2 marks]

Q12. Suppose k events form a partition of the sample space Ω, i.e., they are disjoint and

Union(Ai) = Ω

Assume that P(B) > 0 where B is a subset of Ω.

Given the above information, please state whether the following statement is true or false.

If P(A1|B) < P(A1) then P(Ai|B) > P(Ai) for some i =2,...,k. [1 mark]

Q13. Suppose you want to divide a 52 card deck into four hands with 13 cards each. What is the probability that each hand has a king? [3 marks]

Q14. Two dice are rolled.

A = ‘sum of two dice equals 3’

B = ‘sum of two dice equals 7’

C = ‘at least one of the dice shows a 1’

(a) What is P(A|C)? [1 mark]

(b) What is P(B|C)? [1 mark]

(c) Are A and C independent? [1 mark]