Descriptive component (Model Paper)

B.Sc. Mathematics

Answer any two questions from Part 1 and any two questions from Part 2. If you answer more than two questions from any part, only the first two will be considered. Please explain all your steps.

PART 1

1. A pair of six-sided dice are rolled together. What is the probability that the sum of the numbers rolled is 6?

2. Consider the two statements below and answer the questions that follow:

Statement A: All crocodiles are happy

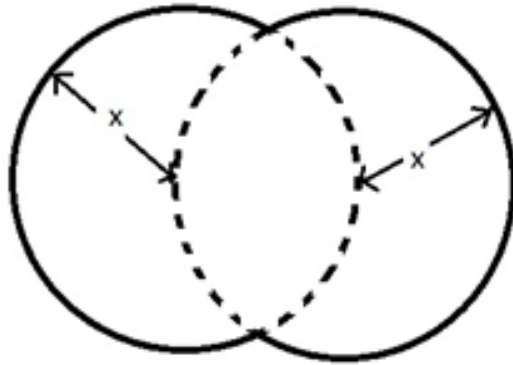Statement B: All happy animals like music

Draw a Venn diagram to represent these statements. Is it true that some animals that like music are crocodiles? Is it possible that every animal that likes music is a crocodile?

3. Draw a rough graph of speed versus time of a bus in the city of Bunglore. The bus starts from the bus stand and in a minute its speed is 60 km/hr. For the next ten minutes, it loses speed at 5 km/hr every minute, and then it continues at the same speed for the next ten minutes.
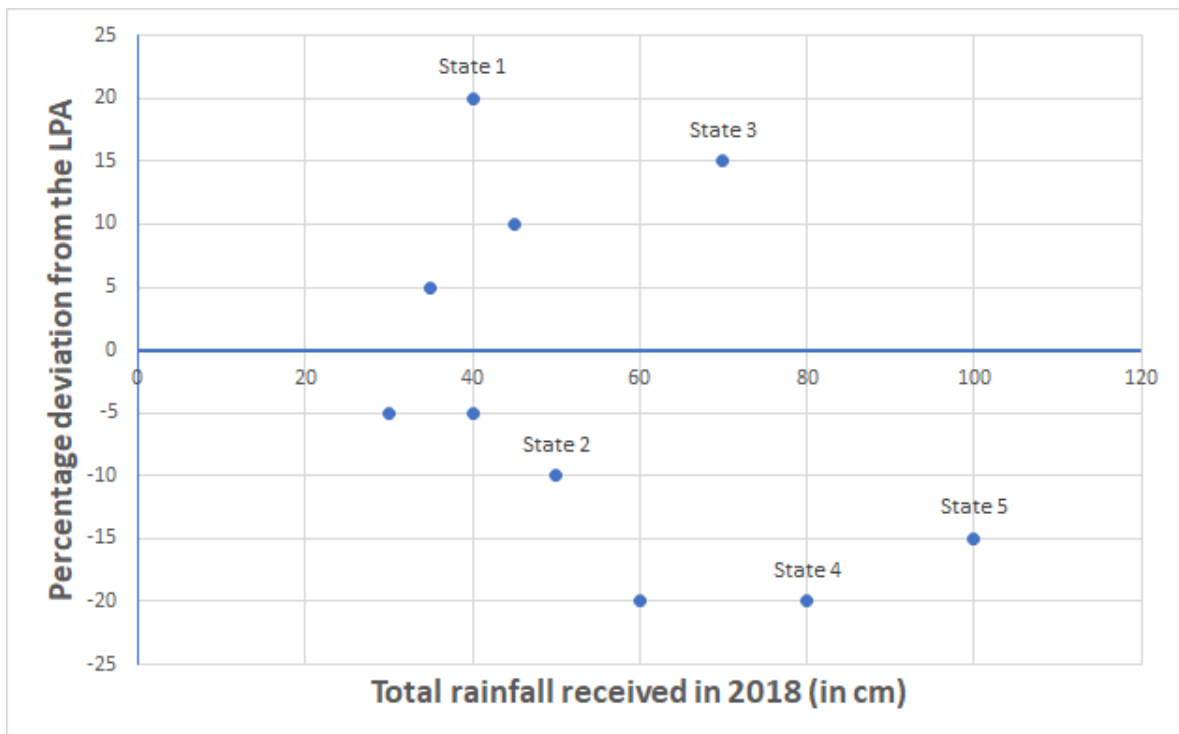
PART 2

1. Every neighbourhood in the city Bunglore has a garbage collection point which attracts a lot of stray dogs. Small localities have about ten dogs at the garbage centre whereas big localities have about twenty dogs at the garbage centre. Estimate the number of stray dogs in Bunglore. State any assumptions that you make.

2. The figure shows two circles with the same radius x arranged such that each one passes through the centre of the other. Find the perimeter of the shape outlined in bold.

3. The Long Period Average (LPA) rainfall received by a place is calculated as the average rainfall received by it between 1951 and 2000, measured in centimetres.

The graph below shows the rainfall received by different states in 2018 versus the deviation from the LPA.

i) What is the LPA of State 5?

ii) Among State 2 and State 3, which has a higher LPA?

iii) What is the average deviation from LPA among States 1-5?

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