Domain - Specific MCQs -

***Science Domain*: Biology | Chemistry | Environmental Science and Sustainability | Information Science | Mathematics | Physics**

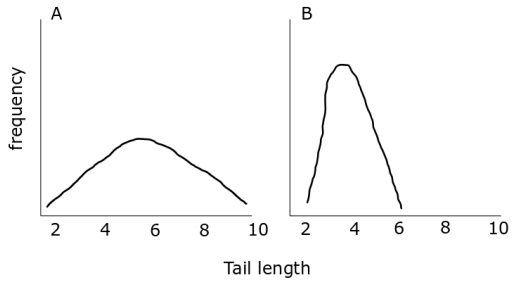
Eight people are taking a lift together. One person who weighs 65 kg exits the lift, and a new person comes in. The average weight of the people in the lift then increases by 2.5 kg. What is the weight of the new person?

a) 76 kg
b) 76.5 kg
c) 85 kg
d) We cannot determine it without more information

You choose a random number between 1 and 100. Which of the following is the least probable?

a) Your number is even
b) Your number is a single digit number
c) Your number is a multiple of 6
d) Your number is a multiple of 7

Scientists measured the tail lengths of monkeys from two different species A and B. They took measurements of 30 different individuals from each species. They plotted all the tail lengths as a frequency distribution as seen below, where the x-axis has the measured tail lengths in inches, and the y-axis has the number of times each tail length was measured.



Which of the following statements is TRUE?

a) Mean and variation in A are larger than in B
b) Mean is greater in A, but variation is same in A and B
c) Mean and variation are smaller in A than in B
d) Mean is smaller in A, but variation is larger in B

60% of the students in a class like biology and 45% like history. Which of the following can we be sure of?

a) Every student likes either biology or history
b) There are students who like history but don't like biology
c) There are students who like biology but don't like history
d) There are students who dislike both subjects

I place a narrow cylindrical container and a wide cylindrical container on the ground next to each other to collect rainwater. Which of the statements below is true after it rains?

a) The water level will be higher in narrow tube
b) The water level will be higher in wide vessel
c) Both vessels collect the same volume of water.
d) Both collect water to the same height.

A factory releases 500 tonnes of carbon dioxide per year. If the government implements a policy that reduces emissions by 15% each year, how much carbon dioxide will the factory emit after two years?

a) 382.5 tonnes
b) 425 tonnes
c) 357.5 tonnes
d) 361.25 tonnes

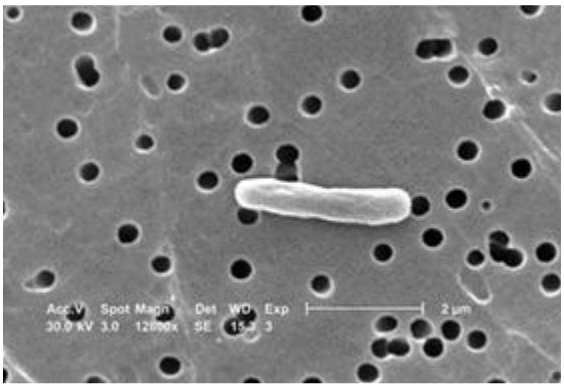
Estimate the order of magnitude of a human's lifetime in seconds.

a) 109 seconds
b) 105 seconds
c) 1012 seconds
d) 1015 seconds

A forest's tree population is given by the function $P(t)=1000-50t$, where $P(t)$ is the number of trees after t years. How long will it take for the forest to lose half of its original tree population due to deforestation?

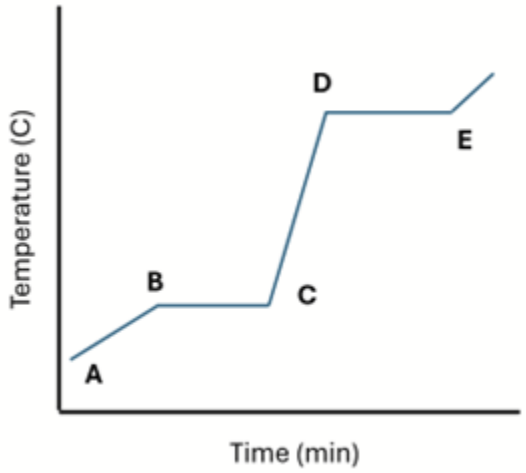
a) 10 years
b) 15 years
c) 20 years
d) 25 years

A scale bar is a line that represents the proportions of a drawing to the actual object. In the drawing below, a scale bar is shown. The estimated size of Escherichia coli, a microorganism is _____ µm



a) 4
b) 3
c) 20
d) 0.2

In the process of ice melting and water boiling, the temperature graph looks like this:



The period of most rapid heating is:

a) A to B
b) B to C
c) C to D
d) D to E

When we toss a fair coin, we get heads with 50% chance and tails with 50% chance. Which of the following statements is true?

a) If I toss a coin and get heads, the next time, I must get tails.
b) I toss a coin six times and get heads. The chances of getting tails the seventh time is more than 90%.
c) If I toss a coin twice, I will definitely get one heads and one tails.
d) I toss a coin six times and get heads each time. The chances of getting tails the seventh time is 50%.

For a solid object, the ratio of surface area to volume is important for various reasons, such as how quickly the object cools down. Which of the following objects has the greatest surface area to volume ratio?

a) A cube with side 1 unit
b) A cube with side 2 units
c) A cube with side 3 units
d) All cubes have the same surface area to volume ratio

X is a negative number. Y is a number whose sign is not known. Which one of the following is guaranteed to be positive (irrespective of the value of X and Y)?

a) X2+Y
b) X2-Y
c) Y2+X
d) Y2-X

In a chemical reaction, the amount of product doubles every 5 seconds. If 100% of the product is formed at 60 seconds, then 50% of the product was formed at:

a) 30 seconds
b) 45 seconds
c) 55 seconds
d) 59 seconds

You have the following coins/notes in your wallet:

- One Rupee Coin: 2
- Two Rupee Coin: 4
- Ten Rupee Note: 1
- Twenty Rupee Note: 1
- Fifty Rupee Note: 2

- Hundred Rupee Note: 1

The minimum whole Rupee amount that you cannot pay exactly using the coins/notes in your wallet is:

a) 40 Rupees
b) 41 Rupees
c) 199 Rupees
d) 241 Rupees

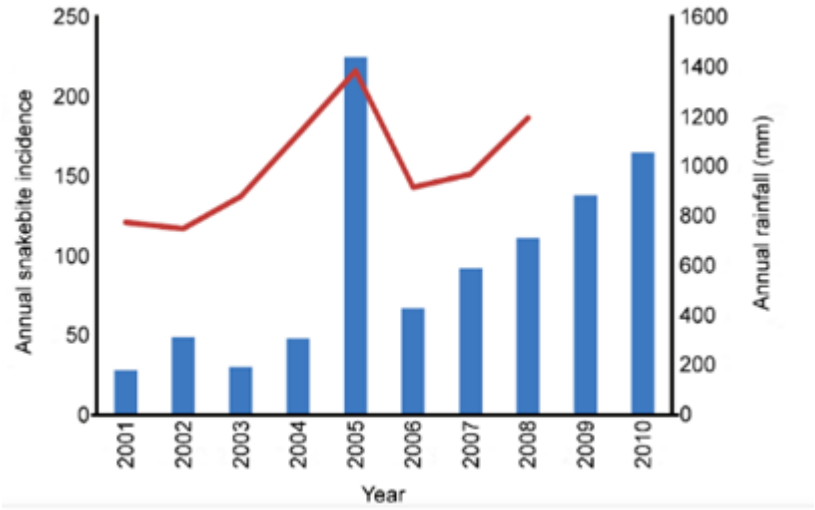
The average temperature of a city increases by 2°C every decade due to climate change, and the current average temperature is 25°C. What will the average temperature be in 40 years?

a) 33°C
b) 37°C
c) 41°C
d) 35°C

The amount of pollution in a lake is modeled by the function P(t)=10t−t2, where P(t) is the pollution level (in tonnes) after t years. The pollution level will start decreasing after

a) 0 years
b) 2 years
c) 5 years
d) 10 years

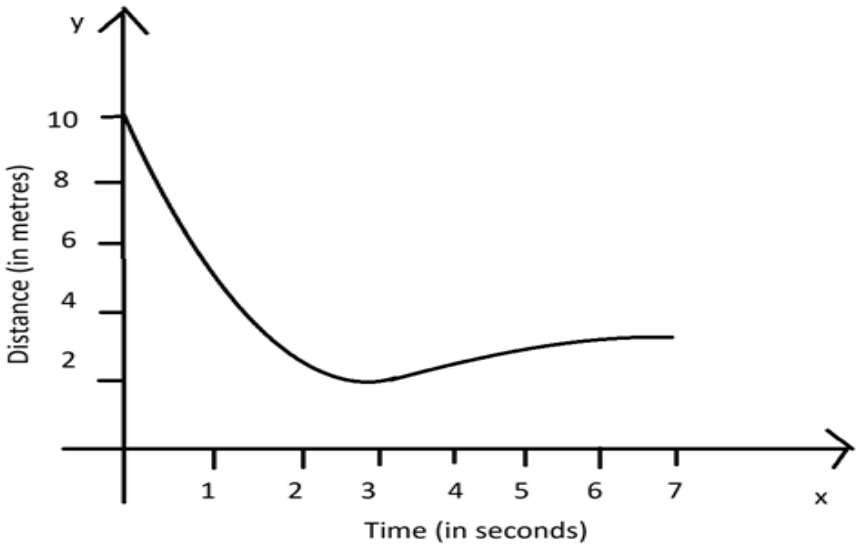
The annual rainfall (shown by the red line) and the annual snake bite incidences (shown by the blue bars) in Tamil Nadu is given in the graph below. State which of the following is true:



a) There were more snake bites in the years which recorded higher rainfall.

b) Snake bites are less as most snakes are killed these days.
c) Cannot comment on the relationship between rainfall and snake bites with given data.
d) High rainfall leads to lesser snake bites as snakes do not come out during rains.

A leopard is chasing a deer. The x-axis has the time, and the y-axis has the distance between the leopard and the deer. Which of the following descriptions matches the graph best?



a) The leopard catches the deer after around 2 seconds, and then starts moving away slowly.
b) The deer runs very fast for two seconds, realises it will never escape, and then stands still while the leopard moves towards it.
c) The distance between the leopard and deer decreases for around 2 seconds and then slowly increases.
d) The deer stands still for the first two seconds, then starts running towards the leopard.

Suppose we have an unfair coin in which the probability of getting heads is 2/3, and the probability of getting tails is 1/3. I toss the coin two times. Which of the following is true?

a) The probability of getting two heads is the same as the probability of getting heads once and tails once.
b) The probability of getting two heads is more than the probability of getting heads once and tails once.
c) The probability of getting two heads is less than the probability of getting heads once and tails once.
d) Since the probability is not ½, we cannot determine the answer.

A dust filter removes 30% of the dust particles passing through it. If two identical filters are used one after the other, what percentage of the dust particles will be removed after both filters?

a) 60%
b) 51%
c) 49%
d) 30%

Recall that the volume of a sphere is $(4/3)\pi r3$. Three water drops with equal radii r combine to form a single, larger drop. The radius of the larger drop is:

a) Equal to 3r
b) Between 2r and 3r
c) Greater than 3r
d) Between r and 2r

X and Y are related in such a way that every time X doubles, Y gets halved. What happens when X is halved?

a) Y is quartered
b) Y doubles
c) Y stays the same
d) We cannot say without more information

You have a set of 5 cricket balls. One of them is defective and has a different weight when compared to the other four. You label the balls A, B, C, D and E and weigh them in groups of 3. The data you obtain is as follows:

Balls together weighed	**Weight (g)**
A, B, C	450
A, B, D	480
A, B, E	480
A, C, D	450
A, C, E	450
A, D, E	480
B, C, D	450
B, C, E	450
B, D, E	480
C, D, E	450

Based on the data provided, select the correct option:

a) Ball A is defective and is heavier than the other four.
b) Ball B is defective and is heavier than the other four.
c) Ball C is defective and is lighter than the other four.
d) Ball D is defective and is lighter than the other four.

Seema's daily routine before leaving for work includes the following six activities:

- Brushing teeth
- Drinking tea
- Ironing clothes
- Taking a bath
- Eating breakfast
- Taking her prescription medicine

She has to brush her teeth before drinking tea and having breakfast. She also needs to iron her clothes before taking a bath. Her doctor has advised her to take her medicine after breakfast. Given these constraints, which of the following statements is correct?

a) Among the six activities, taking medicine must always be the last one in the daily routine.
b) In her daily routine, Seema would never take her medicine before brushing her teeth.
c) In her daily routine, Seema would never take her medicine before ironing her clothes.
d) In her daily routine, Seema would never take her medicine before drinking tea.
