**[Que-32] - 15000 students sat for an examination. The mean marks was 49 and the distribution of marks had a standard deviation of 6. Assuming that the marks were normally distributed what proportion of students scored (a) more than 55 marks, (b) more than 70 marks**

To determine the proportion of students who scored more than a certain mark in a normally distributed dataset, we can use the Z-score formula. The Z-score formula is given by:

Z=

where:

* X is the score,
* μ is the mean,
* σ is the standard deviation.

Once we have the Z-score, we can use the standard normal distribution table (or a calculator) to find the corresponding cumulative probability and determine the proportion of students.

Given:

* Mean (μ) = 49
* Standard deviation (σ) = 6

### **(a) Proportion of students who scored more than 55 marks**

1. Calculate the Z-score for 55 marks: Z== =1
2. Using the standard normal distribution table, find the cumulative probability for Z=1.

The cumulative probability for Z=1 is approximately 0.8413. This is the proportion of students who scored less than 55 marks.

1. To find the proportion of students who scored more than 55 marks: P(X>55)=1−P(X≤55)=1−0.8413=0.1587

So, approximately 15.87% of students scored more than 55 marks.

### **(b) Proportion of students who scored more than 70 marks**

1. Calculate the Z-score for 70 marks: Z=670−49 =621 =3.5
2. Using the standard normal distribution table, find the cumulative probability for Z=3.5.

The cumulative probability for Z=3.5 is approximately 0.99977. This is the proportion of students who scored less than 70 marks.

1. To find the proportion of students who scored more than 70 marks: P(X>70)=1−P(X≤70)=1−0z99977=0.00023

So, approximately 0.023% of students scored more than 70 marks.