

Chapter 1 Class 11 - Sets - Case Based Question Worksheet 2 by teachoo

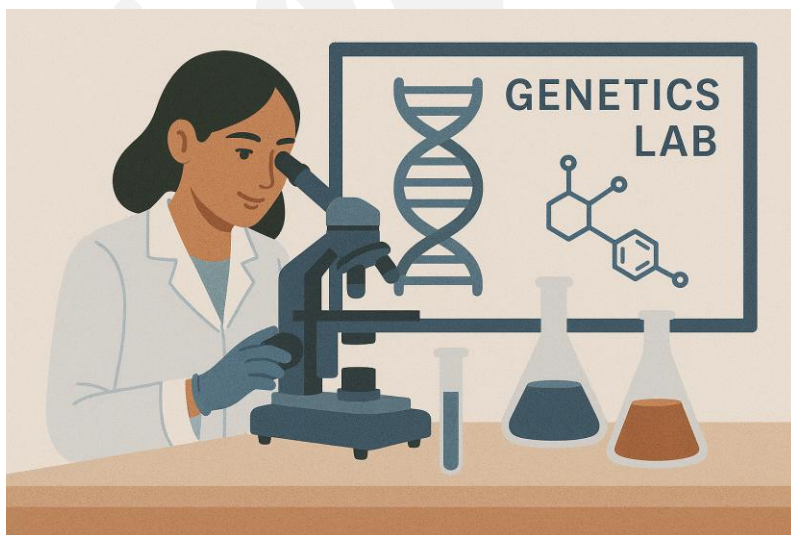
Chapter: [Chapter 1 Class 11 Maths – Sets](#)

Name: _____

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Case 1: Genetics Lab



A genetics lab is researching a disease. Let U be the set of all known human genes.

- $D = \{ \text{genes associated with the Disease} \}$
 - $T = \{ \text{genes that can be Targeted by a new drug} \}$
 - $E = \{ \text{genes that are Essential for normal cell function} \}$
1. (1 mark) The most promising genes for a cure are those that are associated with the disease and can be targeted by the drug. Which set represents these promising genes?
 2. (1 mark) A major side effect could occur if the drug targets essential genes. Which set represents these potentially dangerous targets?
 3. (1 mark) Describe the set $D - T$ in words.
 4. (2 marks) The ideal therapeutic candidates are genes that are associated with the disease, can be targeted by the drug, but are NOT essential for normal cell function. Write the set for these ideal candidates. Explain why this specific intersection and difference is important.

Case 2: Airline Route Planning



An airline is planning its flight network. Let U be all airports.

- $I = \{ \text{airports in India} \}$

- $A = \{ \text{airports in Asia} \}$
- $H = \{ \text{airports that are designated as 'Hubs'} \}$

It is known that all of the airline's hubs are in India.

1. (1 mark) Express the relationship that all hubs are in India using subset notation.
2. (1 mark) What does the set $I \cap H$ simplify to, based on the given information?
3. (1 mark) A "Point-to-Point" flight is one that connects two airports in India that are not hubs. Which set represents the airports eligible for these flights?
4. (2 marks) Draw a Venn diagram representing the relationship between the sets I , A , and H . A flight is considered "short-haul international" if it connects an Indian airport to a non-Indian airport within Asia. Write the set of destination airports for these flights.

Case 3: E-commerce Recommendation Engine



An online store's algorithm suggests products to a user. Let U be all products.

- $P = \{ \text{products the user has previously Purchased} \}$
- $V = \{ \text{products the user has Viewed in the last 30 days} \}$

- $C = \{\text{products currently in the user's Shopping Cart}\}$
- 1. (1 mark) To avoid annoying users, the algorithm should not recommend products they have already purchased. Which set represents all the products that are "safe" to recommend?
- 2. (1 mark) The "Items you may be interested in" feature shows products the user has viewed but not added to their cart. Which set represents this?
- 3. (1 mark) The "Complete your order" reminder should feature items in the cart that have not yet been purchased. Which set represents this?
- 4. (2 marks) A powerful recommendation is to suggest items that are frequently viewed by people who also purchased items from the user's cart. Let F be the set of frequently viewed items. Explain why the set $(F \cap C) - P$ would be a poor choice for this recommendation and suggest a better set.

Important links

- Answer of this worksheet - <https://www.teachoo.com/25611/5371/Case-Based-Questions---Worksheet-2/category/Teachoo-Questions---Case-Based/>
- Full Chapter with Explanation, Activity, Worksheets and more – <https://www.teachoo.com/subjects/cbse-maths/class-11th/ch1-11th-sets/>
- Maths Class 11 - <https://www.teachoo.com/subjects/cbse-maths/class-11th/>

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