



A collage of various analytical chemistry and data visualization elements. It includes a lightbulb with a brain-like filament, a 3D pie chart, a flowchart with arrows, laboratory glassware like test tubes and flasks, and a smartphone displaying data. The background is white with a pattern of black circles and diamonds.

EPEA516 ANALYTICAL SKILLS II

Dr. Harish Mittu
Associate Professor

Learning Outcomes



After this lecture, you will be able to

- develop understanding about the basics of family based problems,
- analyze different types of family based problems,
- solve various problems relating to relationship among family members.

Family Based Problems

- Clues/Hints
- Relationship
 - Members of Family
 - Profession
 - Qualities
 - Preferences
- Analyze - Information

Problem 1

- Prashant Arora has three children - Sangeeta, Vimal and Ashish. Ashish married to Monika, the eldest daughter of Mr. and Mrs. Roy. The Roys married their youngest daughter to the eldest son of Mr. and Mrs. Sharma, and they had two children named Amit and Shashi. The Roys have two more children, Roshan and Vandana, both elder to Veena. Sameer and Ajay are sons of Ashish and Monika. Rashmi is the daughter of Amit. What is the surname of Rashmi ?

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- Rashmi – Daughter of Amit
- Amit – Eldest Son of Sharma's
- Surname of Rashmi - **Sharma**

Problem 2

- Prashant Arora has three children - Sangeeta, Vimal and Ashish.
Ashish married to Monika, the eldest daughter of Mr. and Mrs. Roy. The Roys married their youngest daughter to the eldest son of Mr. and Mrs. Sharma, and they had two children named Amit and Shashi. The Roys have two more children, Roshan and Vandana, both elder to Veena. Sameer and Ajay are sons of Ashish and Monika. Rashmi is the daughter of Amit. How is Mrs. Roy related to Ashish?
- Ashish – Married to Monika
- Monika – Daughter of Mrs. Roy
- Mrs. Roy - Mother-in-law of Ashish

Problem 3

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- Sameer – Son of Ashish and Monika
- Sameer – Grandson of Monika's father

Problem 4

- Six persons A, B, C, D, E and F were playing a game of cards. A's father, mother and uncle were in the group. There were two women. B, the mother of A, got more points than her husband. D got more points than E but less than F. Niece of E got the lowest points. Father of A got more points than F but could not win the game.
- Who is the husband of B?

Problem 4

- Six persons A, B, C, D, E and F were playing a game of cards. A's father, mother and uncle were in the group. There were two women. B, the mother of A, got more points than her husband. D got more points than E but less than F. Niece of E got the lowest points. Father of A got more points than F but could not win the game. Who is the husband of B?
- Points of B's husband (Father of A) < Points of B (Mother of A)
- Points of F < Points of Father of A
- Points of E < Points of D < Points of F
- Points of (E < D < F < Father of A < Mother of A < A(Niece of E))
- Points of (E < D < F < C(Father of A) < B(Mother of A) < A(Niece of E))

C is husband of B

Problem 5

Problem 5

- A, B, C, D, E and F are six members in a family in which there are two married couples. D is brother of F. Both D and F are lighter than B. B is mother of D and lighter than E. C, a lady, is neither heaviest nor the lightest in the family. E is lighter than C. The grandfather in the family is the heaviest. How is E related to F ?

- With respect to weight,

$$F < B, D < B, B < E, E < C$$

$$F < D < B < E < C < A$$

$$\text{or } D < F < B < E < C < A$$

D - Brother of F
B - Mother of D and F
A - Heaviest - Grandfather
C - Lady - One couple - AC
B - Female - Other couples - BE
B - Mother of F E - Husband of B

E - Father of F

Problem 6

- A, B, C, D, E and F are six members in a family in which there are two married couples. D is brother of F. Both D and F are lighter than B. B is mother of D and lighter than E. C, a lady, is neither heaviest nor the lightest in the family. E is lighter than C. The grandfather in the family is the heaviest.
- How many male members are there in family?

Data Inadequate

D (Male) - Brother of F

B (Female) - Mother of D and F

A (Male)- Heaviest - Grandfather

C (Female)- Lady

B - Female- Mother of F

E - Male -Husband of B

F - Gender Not Known

Couples - BE & AC

Problem 7

- P, Q, R, S, T, and U are travelling in a bus. There are two reporters, two technicians, one photographer and one writer in the group. The photographer P is married to S who is a reporter. The writer is married to Q who is of the same profession as that of U. P, R, Q, S are two married couples and nobody in the group has same profession. U is brother of R. Which of the following is a pair of technicians ?
 - (a) RS
 - (b) SU
 - (c) PT
 - (d) QU

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P (Photographer) - Married to S (Reporter)

R (Writer) - Married to Q (Technician)

U - Technician

U - Brother of R

T - Reporter

Technicians – Q and U

Problem 8

- P, Q, R, S, T, and U are travelling in a bus.

There are two reporters, two technicians, one photographer and one writer in the group. The photographer P is married to S who is a reporter. The writer is married to Q who is of the same profession as that of U. P, R, Q, S are two married couples and nobody in the group has same profession. U is brother of R.

How is R related to U? R - brother or sister of U

P (Photographer) – Married to S (Reporter)

R (Writer) - Married to Q (Technician)

U - Technician

U - Brother of R

T - Reporter

Problem 9

- P, Q, R, S, T, and U are travelling in a bus.

There are two reporters, two technicians, one photographer and one writer in the group. The photographer P is married to S who is a reporter. The writer is married to Q who is of the same profession as that of U. P, R, Q, S are two married couples and nobody in the group has same profession. U is brother of R.

Which of the following is pair of husbands?

- (a) PQ
- (b) PR
- (c) QS
- (d) Can not determined

P (Photographer) - Married to S (Reporter)

R (Writer) - Married to Q (Technician)

U - Technician and Brother of R

T - Reporter Gender of P, Q, R, and S not given

Problem 10

- There are five persons P, Q, R, S, and T. One is football player, one is chess player and one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player. Who is hockey player?
 - (a) P
 - (b) Q
 - (c) R
 - (d) S
 - (e) T

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- There are five persons P, Q, R, S, and T. One is football player, one is chess player and one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player. Who is hockey player?
- (a) P (b) Q (c) R (d) S (e) T

P and S – Unmarried Ladies (Not Players)

Q (Male and Football Player) – Brother of R

T (Male) – Chess Player

R (Wife of T) – Hockey Player

Problem 11

- There are five persons P, Q, R, S, and T. One is football player, one is chess player and one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player.

The three ladies are P, R, and S

P and S – Unmarried Ladies (Not Players)

Q (Male and Football Player) – Brother of R

T (Male) – Chess Player

R (Wife of T) – Hockey Player

Problem 12

- There are five persons P, Q, R, S, and T. One is football player, one is chess player and one is hockey player. P and S are unmarried ladies and do not participate in any game. None of the ladies plays chess or football. There is a married couple in which T is the husband. Q is the brother of R and is neither a chess player nor a hockey player.

The Chess Player is T

P and S – Unmarried Ladies (Not Players)

Q (Male and Football Player) – Brother of R

T (Male) – Chess Player

R (Wife of T) – Hockey Player

Problem 13

- P, Q, R, S, T, and U are six members in a family in which there are two married couples. T, a teacher is married to doctor who is mother of R and U. Q, lawyer is married to P. P has one son and one grandson. Of two married ladies, one is a housewife. There is also one student and one male engineer in the family. How is P related to R?
 - (a) Grandmother
 - (b) Grandfather
 - (c) Mother
 - (d) Sister

Problem 13

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How is P related to R?

P is Grandfather of R.

QP - Couple

T- Male & P (Female) - Housewife

Q - Lawyer

S – Mother of R & U

T – Teacher

P – One Son & One Grandson

R & U – Children of T

T (Son) & R or U (Grandson) of P

ST - Couple

Grandson – Male Engineer

S (Female) - Doctor

Granddaughter – Student

Problem 14

- P, Q, R, S, T, and U are six members in a family in which there are two married couples. T, a teacher is married to doctor who is mother of R and U. Q, lawyer is married to P. P has one son and one grandson. Of two married ladies, one is a housewife. There is also one student and one male engineer in the family.

How is R related to U?

R - Brother or Sister of U.

QP - Couple

T- Male & P (Female) - Housewife

Q - Lawyer

S – Mother of R & U

T – Teacher

P – One Son & One Grandson

R & U – Children of T

T (Son) & R or U (Grandson) of P

ST - Couple

Grandson – Male Engineer

S (Female) - Doctor

Granddaughter – Student

Problem 15

- P, Q, R, S, T, and U are six members in a family in which there are two married couples. T, a teacher is married to doctor who is mother of R and U. Q, lawyer is married to P. P has one son and one grandson. Of two married ladies, one is a housewife. There is also one student and one male engineer in the family.

Who is a student? Granddaughter is a student.

QP - Couple

Q - Lawyer

T - Teacher

R & U - Children of T

ST - Couple

S (Female) - Doctor

T- Male & P (Female) - Housewife

S – Mother of R & U

P – One Son & One Grandson

T (Son) & R or U (Grandson) of P

Grandson – Male Engineer

Granddaughter – Student

Conclusion

- Family Based Problems
- Relationship
 - Members of Family
 - Profession
 - Qualities
 - Preferences
- Analyze - Information

Summary

- **Puzzle Test**
 - **Family Based Problems**

That's all for now...