Notes For Blood Relations And Calendars

Blood relation is one of the most important topics of logical reasoning and found its importance in almost every entrance exam. This topic tests the analytical skills of the students and their solution approach. The questions asked in this chapter depend upon 'Relations'. You should have a sound knowledge of the blood relation in order to solve the questions.

To remember easily, the relation may be divided into two forms:

RELATION OF PATERNAL SIDE:

Father's father	Grandfather
Father's mother	Grandmother
Father's brother	Uncle
Father's sister	Aunt
Children of uncle	Cousin
Wife of uncle	Aunt
Children of aunt	Cousin
Husband of aunt	Uncle

RELATION OF MATERNAL SIDE

Mother's father	Maternal Grandfather
Mother's mother	Maternal Grandmother
Mother's brother	Maternal Uncle
Mother's sister	Aunt
Children of maternal uncle	Cousin

Wife of maternal uncle	Maternal Aunt
Children of maternal aunt	Cousin
Husband of maternal aunt	Maternal Uncle

OTHERS

Son's wife → Daughter-in-law
Daughter's husband → Son-in-law
Husband's (or) wife's father → Father-in-law
Husband's (or) wife's mother → Mother-in-law
Husband's (or) wife's brother → Brother-in-law
Husband's (or) wife's sister → Sister-in-law
Sister's husband → Brother-in-law
Brother's (or) sister's son → Nephew
Brother's (or) sister's daughter → Niece

RELATION FROM ONE GENERATION TO NEXT

GENERATION 1: Grandfather, Grandmother, Maternal grandfather, Maternal grandmother
GENERATION 2: Mother, Father, Uncle, Aunt, Maternal uncle, Maternal aunt
GENERATION 3: Self, Sister, Sister-in-law, Brother, Brother-in-law
GENERATION 4: Son, Daughter, Nephew, Niece

SYMBOLS:

1. '+' for male 2. '-' for female 3. ' ⇔ ' for couples

Type 1: Statement based relationship questions

Problem 1:

Pointing to a lady on the stage, Sonali said, "She is the sister of the son of the wife of my husband." How is the lady related to Sonali?

Solution:

My husband = Sonali's husband
Wife of my husband = is me = Sonali
Son of the wife of my husband = My Son
Sister of the Son of the wife of my Husband = My Son's Sister = My daughter

So, the lady on the stage is Sonali's daughter.

Problem 2:
Shubham said, "This girl is the sister of the grandson of my mother." How is the lady related to Shubham?
Solution:
My mother = Shubham's mother
Grandson of my mother = My son or My nephew
Sister of the grandson of my mother = My daughter or My niece
So, the lady on the stage is Shubham's daughter or his niece.

Problem 3:
Pointing to a lady a man said, "Her husband is the only son of my mother". How is the lady related to the man?
Solution:
My mother's only son = is me (man)
Her husband = is me
So, the lady is Man's wife.

Problem 4:
Arun told Pankaj, "Yesterday I met the son of my wife's father in law". How is Arun related to this man?
Solution:
My wife's father in law = My father
Son of my wife's father in law = is me or my brother (I can't meet me myself. So, it is obvious my father has 2nd son at least)
So, the man is Arun's brother.

Problem 5:
Pointing to a man Manisha said, "He is the youngest son of my father-in-law's only son". How is Manisha related to this youngest son's father?
Solution:
Manisha's father in law's only son = Manisha's husband
Youngest son of my father-in-law's only son is my husband's son = My son = Manisha's son
So, Manisha is the wife of the youngest son's father

Type 2: Puzzle type questions with a family relationship component

Problem 1:

A family consists of a husband and wife, their three sons and two daughters, three wives of three sons. How many females are in this family?

Solution:

Husband wife (female)

Three sons = S1 S2 S3 and two daughter = D1 D2

Son's wives = W1 W2 W3

So, the total number of females = wife + D1 + D2 + W1 + W2 + W3 = 6 females.

Directions for problem 2 to 6:

If a + b means, a is the daughter of b,

a - b means, a is the husband of b,

a × b means, a is the brother of b.

Problem 2:

What does the relation p × q - r show?

(a) p is the son-in-law of r

(b) p is the brother of r

(c) r is the wife of p

(d) None of these

Solution:

p × q means p is the brother of q

q - r means, q is the husband of r i.e.

p is the brother-in-law of r or r is the sister-in-law of p.

So the answer to this question is an option (d).

Problem 3:

If h+i × j+k × l+m × n, then what is the present generation of h. Assume that the oldest generation of this group is 1st generation.

(a) 2nd (b) 3rd

(c) 1st (d) None of these

Solution:

Here symbol '+' is for a generation change.

m × n = m is the brother of n

l+m = l is the daughter of m (1st generation)

k × l = k is the brother of l

j+k = j is the daughter of k (2nd generation)

i × j = i is the brother of j

h+i = h is the daughter of i (3rd generation)

Hence, present generation of ‘h’ = 3rd generation i.e. option (c)

Problem 4:

Which of the following options does not hold?

(a) a+b × c
(b) a-b × c
(c) a+b+c
(d) a+b-c

Solution:

(a) a+b × c, here ‘b’ is the brother of ‘c’ i.e ‘b’ is a male and ‘a’ is the daughter of ‘b’. This option is correct.
(b) a-b × c, here ‘b’ is the brother of ‘c’ i.e ‘b’ is a male and ‘a’ is the husband of ‘b’ This option can not hold. ‘a’ can’t be the husband of ‘b’, because ‘b’ comes out a male.

Problem 5:

From the statement a × b × c × d, which of the following statements is not necessarily true?

(a) ‘b’ is the brother of ‘a’
(b) ‘c’ is the brother of ‘a’
(c) ‘d’ is the brother of ‘c’
(d) a,b,c are male

Solution:

a × b × c × d, here ‘c’ is the brother of ‘d’, ‘b’ is the brother of ‘c’ and ‘a’ is the brother of ‘b’
So, here a,b,c are males.
Option (c) ‘d’ is the brother of ‘c’ is not necessarily true because we don’t know whether ‘d’ is male or not.

Problem 6:

From the statement p-q+r × s, how is ‘q’ related to ‘s’?

(a) Niece
(b) Sister
(c) Daughter
(d) Brother

Solution:

r × s = ‘r’ is the brother of ‘s’ (‘r’ is male)
q+r = ‘q’ is the daughter of ‘r’(‘q’ is a female)
p-q = ‘p’ is the husband of ‘q’
So from the above conclusion, ‘q’ is the niece of ‘s’ i.e. option (a) is the correct answer.

Directions for questions 7 to 8.

a*b means ‘a’ is the brother of ‘b’

a@b means ‘a’ is the daughter of ‘b’

a$b means ‘a’ is the sister of ‘b’

Problem 7:

Which of the following show the relationship ‘p’ is the paternal uncle of ‘c’?

(a) n $ o @ p

(b) n @ o $ p

(c) n @ o * p

(d) None of these

Solution:

(a) n $ o @ p

o @ p = ‘o’ is the daughter of ‘p’ and n $ o = ‘n’ is the sister of ‘o’

So, here ‘p’ is either the father or the mother of ‘n’.

(b) n @ o $ p

o $ p = ‘o’ is the sister of ‘p’ and n @ o = ‘n’ is the daughter of ‘o’

So, ‘p’ is either uncle or aunt of ‘n’ because the gender of p can not be determined.

Hence, the answer will be an option (d).

Problem 8:

abc@d@e*f*g, then how many males and females are there respectively?

(a) 4,3

(b) 3,4

(c) 5,2

(d) Can’t be determined

Solution:

f*g = ‘f’ is the brother of ‘g’ (i.e. ‘f’ is a male)

e*f = ‘e’ is the brother of ‘f’ (i.e. ‘e’ is a male)

d@e = ‘d’ is the daughter of ‘e’ (i.e. ‘d’ is a female)

c@d = ‘c’ is the daughter of ‘d’ (i.e. ‘c’ is a female)

b$c = ‘b’ is the sister of ‘c’ (i.e. ‘b’ is a female)

a$b = ‘a’ is the sister of ‘b’ (i.e. ‘a’ is a female)

Here we can not find the gender of ‘g’.

Here 4 women and 2 men but we can't find the gender of one person.

So, the answer is can’t be determined, option(d)

Some questions for practice:

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1. Introducing a boy, Naveen said, "His mother is the only daughter of my mother-in-law." How is Naveen related to the boy?
(a) Uncle (b) Father
(c) Brother (d) Husband

2. Pointing to a man in a photograph, a woman said, "His brother's father is the only son (and child) of my grandfather." How is the woman related to the man in the photograph?
(a) Mother (b) Sister
(c) Aunt (d) Daughter

3. If Nikita says, "Harshita's father Amit is the only son of my father-in-law Deepak." Then how is Jyoti, who is the sister of Amit, related to Deepak?
(a) Daughter (b) Wife
(c) Daughter-in-law (d) None of these

Directions for Questions 4 to 6:
If a + b means a is the sister of b,
a – b means a is the brother of b,
a ¥ b means a is the daughter of b,
a Π b means a is the mother of b.

4. Which of the following relationships shows that l and n are wife and husband?
(a) l Π m ¥ n (b) l – m ¥ n
(c) l + m ¥ n (d) None of these

5. How many females does this relationship show?
l + m – n + o – p ¥ q
(a) 2 (b) 3
(c) 4 (d) Can't be determined

6. The relationship p + q – r ¥ s Π t shows that
(a) p, q, r, s are children of t
(b) p, q, r, t are children of s

(c) p, q, r are children of t and s

(d) p, q, r, s, t are all siblings.

Answers : 1. (b) 2. (b) 3. (d) 4. (a) 5. (d) 6. (b)

CALENDARS:

Calendar is a small chapter but an important chapter of the reasoning part. Questions in calendars come from time to time for you in your exams.

A calendar *is a series of pages that contains days, weeks and months of a particular year and gives information.*

Normal year: Any year which contains 365 days is called a normal year.

Leap year: Any year which contains 366 days is called a leap year.

Odd days: those number of available days from which we can't complete a week are called odd days.

A normal year has 365 days. In which there are 52 complete weeks and the last day would be an odd day. It would shift the calendar ahead or behind by a certain day.

Suppose in a normal year you start 1st January of the year on Monday, then 30th Dec of that year would be a Sunday and 31st Dec being a Monday and hence, the 1st Jan of the next year will skip the calendar forward by one day.

A leap year has 366 days. If 1st Jan starts with Monday of leap year then 29th Dec would be the last Sunday of that year. 30th Dec will again Monday and 31th Dec will be Tuesday. Hence, 1st Jan of the next year will skip by 2 days.

The number of odd days in different months of a calendar year:

MONTHS	NUMBER OF ODD DAYS
JANUARY	3
FEBRUARY(normal/leap)	0/1
MARCH	3
APRIL	2

MAY	3
JUNE	2
JULY	3
AUGUST	3
SEPTEMBER	2
OCTOBER	3
NOVEMBER	2
DECEMBER	3

NOTE:

1. The number of odd days in the first 100 consecutive years is 5.
2. The number of odd days in the first 200 consecutive years is 3.
3. The number of odd days in the first 300 consecutive years is 1.
4. The number of odd days in the first 400 consecutive years is 0.

Problem 1:
11 August 2019 is a Sunday, what day was on 11 August 1983?
Solution:
To find the day on 11 August 1983, you have to count the number of odd days.
From 1983 to 2019 there are 36 years. Which means 36 odd days and now count how many leap years or 29th Feb will appear.

So, 29th Feb would appear in 1984,1988,1992,1996,2000,2004,2008,2012,2016. So, 9 leap years means 9 further odd days.

Hence, the total number of odd days = 36+9=45 days
45 days have 6 complete weeks and 3 odd days left out.
Going behind 3 odd days from Sunday. Hence, on 11 August 1983 would be a Thursday.

Some question for practice:

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1. What was the day of the week on 13th April 1723?
(a) Monday
(b) Tuesday

(c) Wednesday
(d) Thursday

2. If the third day of the month is Monday. Which of the following will be the 29th day of the week?

(a) Friday
(b) Sunday
(c) Saturday
(d) Tuesday

3. 9th June of leap year was on Thursday. Then what was the day of the week on 17 February?

(a) Wednesday
(b) Monday
(c) Thursday
(d) Tuesday

Answers : 1. (b) 2. (c) 3. (a)

*(Reference for some problems: https://upscfever.com/upsc-fever/en/test/mba/arun-sharma/26.html)