Directions (11-18):
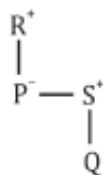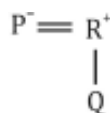
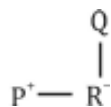**1. (c):** P ÷ R + S +Q means P is the daughter of R who is the father of S who is the father of Q i.e. P is the sister of the father (S) of Q i.e. P is the aunt of Q.

$$R^+$$
$$|$$
$$P^- \!-\! S^+$$
$$|$$
$$Q$$

2. (a): P – R + Q means P is the wife of R who is the father of Q i.e. P is the mother of Q.

$$P^- \!=\! R^+$$
$$|$$
$$Q$$

3. (d): P × R ÷ Q means P is the brother of R who is the daughter of Q i.e. P is the son of Q.

$$Q$$
$$|$$
$$P^+ \!-\! R^-$$

4. (a): P × R – Q means P is the brother of R who is the wife of Q i.e. P is the brother-in-law of Q.
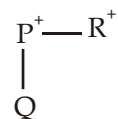
$$P^+ \!-\! R^- \!=\! Q^+$$

5. (c): P + R ÷ Q means P is the father of R who is the daughter of Q i.e. P is the father of R and Q is the mother of R i.e. P is the husband of Q.

$$P^+ \!=\! Q^-$$
$$|$$
$$R^-$$
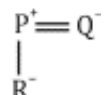
6. (d): P ÷ R +Q means P is the daughter of R who is the father of Q i.e. P is the sister of Q.

$$R^+$$
$$|$$
$$P^+ \!-\! Q$$

7. (a): P × R + Q means P is the brother of R who is the father of Q i.e. P is the uncle of Q.

$$P^+ \!-\! R^+$$
$$|$$
$$Q$$

8. (c): P – R × Q means P is the wife of R who is the brother of Q i.e. P is the sister-in-law of Q.
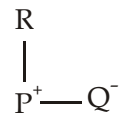
$$P^- \!=\! R^+ \!-\! Q$$

Directions (19-21)

9. (a): P + Q – R means P is the daughter of Q who is the Husband of R i.e. R is the mother of P.

$$Q^+ \!=\! R^+$$
$$|$$
$$P^-$$
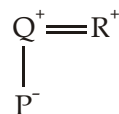
10. (c): P × Q + R means P is the brother of Q who is the daughter of R i.e. P is the son of R.

$$R$$
$$|$$
$$P^+ \!-\! Q^-$$

11. (a): P+ Q × R means P is the daughter of Q who is the brother of R i.e. P is the niece of R.
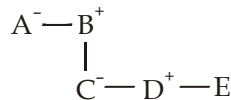
$$Q^+ \!-\! R$$
$$|$$
$$P^-$$
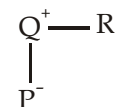
Directions (12-13)

12. (b): A + B # C – D means A is the mother of B, who is the father of C, who is the brother of D, i.e. A is the mother of D's father. So, A is D's grandmother.

$$A^-$$
$$|$$
$$B^+$$
$$|$$
$$C^+ \!\!-\!\! D$$

13. (c): A is aunt of E means A is the sister of the father of E i.e. A * B # E. Clearly, the code in (c) indicates the same.

$$A^- \!\!-\!\! B^+$$
$$|$$
$$C^- \!\!-\!\! D^+ \!\!-\!\! E$$

Directions (14-16)

14. (c): B + D × M ÷ N means B is the mother of D who is the father of M, who , in turn, is the brother of N. Thus, M is the son of D, whose mother is B i.e. M is B's grandson.

15. (e): J ÷ R – T × F means J is the brother of R who is the sister of T who is the father of F i.e. J is the uncle of F; J + R – T × F, means J is the mother of R who is the sister of T who is the father of F i.e. J is grandmother of F; J ÷ M – N × F means J is the brother of M who is the sister of N who is the father of F i.e. J is the uncle of F. 'J is son of F' means F is the mother/father of J who is a male (brother of some person A) i.e. F ×J÷ A OR F + J ÷ A.

16. (b): R is niece of M means R is the daughter of the brother or sister of M i.e. M ÷ K × R – N or M – J + R –N or M – J × R – N OR M ÷ K + R – N.
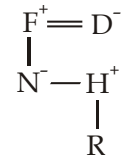
Directions (17-21)

17. (c): P @ Q $ M # T means P is the husband of Q who is the mother of M who is the father of T i.e. P is the father of T's father i.e. P is T's paternal grandfather.

18. (b): R is the sister of H means R is the daughter of the father of H i.e. R is the daughter of the husband (say D) of the mother (say F) of H i.e. R % D @ F $ H.

$$D^+ \!\!=\!\! F^-$$
$$|$$
$$R^- \!\!-\!\! H$$
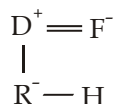
19. (a) : F @ D % K # H means F is the husband of D who is the daughter of K who is the father of H i.e. is the husband of D who is the sister of H i.e. F is H's brother-in-law.

$$K^+$$
$$|$$
$$F^+ \!\!=\!\! D^- \!\!-\!\! H$$
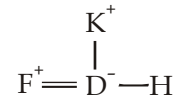
20. (b): H is the brother of N means N is the daughter of H's father and H is a male i.e. N is the daughter of the husband (say F) of the father (say D) of H and H is the father or husband of some othe person (say R) i.e. N % F @ D $ H # R or N % F @ D $ H @ R.
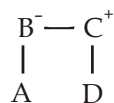
$$F^+ \!\!=\!\! D^-$$
$$|$$
$$N^- \!\!-\!\! H^+$$
$$|$$
$$R$$

21. (a): G $ M @ K means G is the mother of M who is the husband of K i.e. K is the wife of G's son i.e. K is G's daughter-in-law.

$$G^-$$
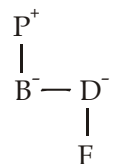$$|$$
$$M^+ \!\!=\!\! K^-$$
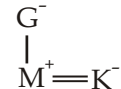
Directions (22-24)

22. (d): R is the daughter of T means (i) T is the mother of R who is the sister of B i.e. T @ R # B; or (ii) T is the husband of the mother (say F) of R who is the sister of say, B i.e. T $ F @ R # B; or (iii) R is the sister of the son (say F) of T i.e. R # F * T; or (iv) R is the sister of the son (say F) of the husband (say B) of T i.e. R # F * B $ T.

23. (e): M * H @ D $ K means M is the son of H who is the mother of D who is the husband of K i.e. H is the mother of K's husband i.e. H is K's mother-in-law.

24. (b): F # J * T $ R @ L means F is the sister of J who is the son of T who is the husband of R who is the mother of L i.e. T and R are respectively the father and mother of J and L of whom F is female and J is male. Thus, F is the sister of each one of J and L, while J is the brother of each one of F and L.

25. (e): X is the grandson of D means (i) X is the brother of the son/daughter (say A) of say, H whose father is D i.e. X + A × H ÷ D or X + A ÷ H ÷ D; or (ii) X is the brother of the son/daughter (say A) of say, H whose mother is D i.e. X + A × H × D or X +11 A ÷ H× D.

26. (c): Cousin.

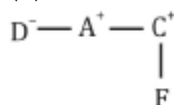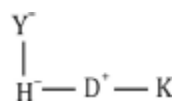$$B^- — C^+$$
$$\;\;|\qquad|$$
$$\;\;A\qquad D$$

27. (a): Father

$$P^+$$
$$|$$
$$B^- — D^-$$
$$\qquad\quad|$$
$$\qquad\quad F$$

28. (c): Either (A) or (B)

$$D^- — A^+ — C^+$$
$$\qquad\qquad|$$
$$\qquad\qquad F$$

29. (e): Mother

$$Y^-$$
$$|$$
$$H^- — D^+ — K$$

30. (a): F

$$F^+$$
$$|$$
$$H^-$$
$$|$$
$$C$$

Direction (31-33):

$$P(+) = Q(-)$$
$$|$$
$$Y(+) = K(-) \qquad J(+) \qquad L(+) = X(-)$$
$$|\qquad\qquad\qquad\qquad\qquad\qquad\;\;|$$
$$Z(+)\qquad\qquad\qquad\qquad\qquad\qquad O$$
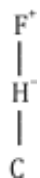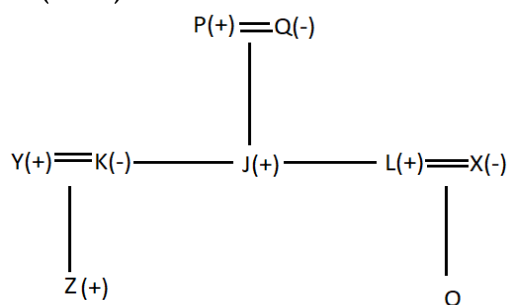
31. (e):   **32. (a):**   **33. (a):**

Direction (34-35):

$$A(+) = B(-)$$
$$P(+)\qquad Q(+) = Y(-)\qquad R(+) = X(-)$$
$$\qquad\qquad\quad J(-)\qquad\qquad\qquad K$$
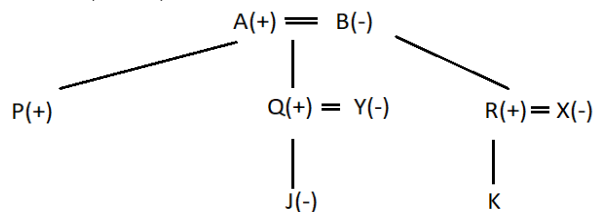
34. (e):

35. (a):

Direction (36-38):

$$A(+) = B(-) — C(+) = D(-)$$
$$P(-)\qquad Q(+)\qquad\qquad R$$
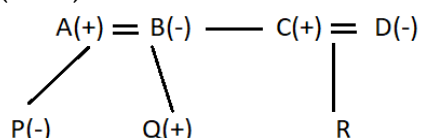
36. (e):   **37. (d):**   **38. (c):**

Direction (39-40):

$$P(+) = Q(-)$$
$$|$$
$$A(+) = C(-) — D(+) = E(-)$$
$$|\qquad\qquad\qquad\qquad\;|$$
$$H(+)\qquad\qquad\qquad\;\;F$$
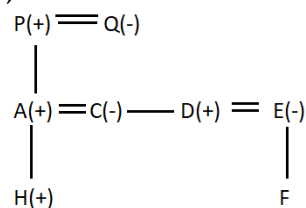
39. (e):

40. (d):

Direction (41-42):

$$P(+) = Q(-)$$
$$|$$
$$K(-) = J(+) — L(-) = M(+)$$
$$|\qquad\qquad\qquad\;\;|$$
$$H(+)\qquad\qquad\;\;Z$$
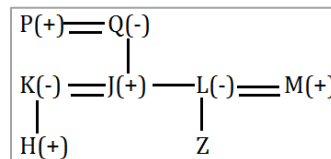
41. (e):

42. (c):

Direction (43-44):

$$X(-) = Y(+) — J(-) = K(+)$$
$$|\qquad\qquad\qquad\;\;|$$
$$H\qquad\qquad\quad Z(+)$$
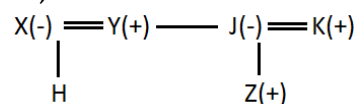
43. (e):

44. (a):

Direction (45-46):

$$B(-) — P(+)$$
$$|$$
$$L(+) = C(-) — A(-) = N(+)$$
$$|\qquad\qquad\quad|$$
$$G\qquad\qquad H(+)$$
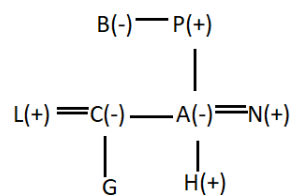
45. (e):

46. (a):

Direction (47-48):

$$P(+) = Q(-)$$
$$|$$
$$A(-) = X(+)$$
$$|$$
$$J(+) — K(+) — L$$
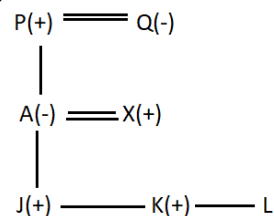
47. (c):

48. (e):

Direction (49-50):

$$J(+) = K(-)$$
$$|$$
$$P(+) = Q(-)$$
$$|$$
$$X(+) — Y(-) — Z$$

49. (e):   **50. (a):**   **51. (e):**

Directions (1-2)

B(+)—— I(+) ⟺ K(–) ——A

J(+) —— C(–)
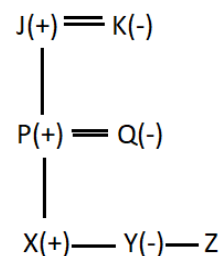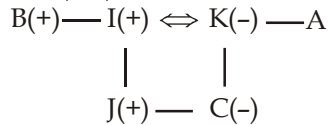
1. (b): hence J is brother of C

2. (d):

Directions (3-7)

A ⟺ W —— M (+)

U(+) ⟺ D(–)   X(–) ⟺ V(+)

R(+)   P(–)   T(–)   S(–)

Q(+)
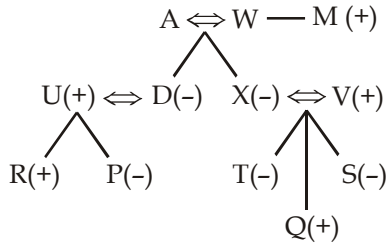
3. (b)   **4. (a)**   **5. (c)**   **6. (d)**   **7. (c)**

Directions (8-9)

8. (b):

B(–)

D(+) ⟺ E (–)

A(+)

9. (b):

H

F(+) ⟺ I(–) —— J(+)

G(+)
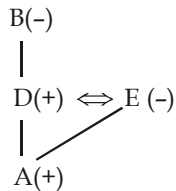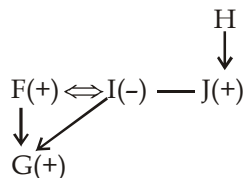
Hence, I is daughter of H.

Directions (10-12)

10. (b):

E(–) ⟺ B(+)

J(–) —— F(+)
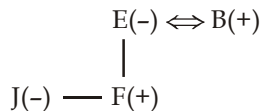
Hence E is mother of J.

11. (c):

H(–) —— T

S(–) ⟺ M(+)
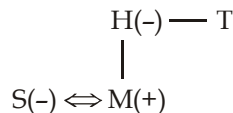
Hence M is husband of S.

12. (b):

V(–) —— Q

W(+) ⟺ C(–)—— T(+)

P(+)
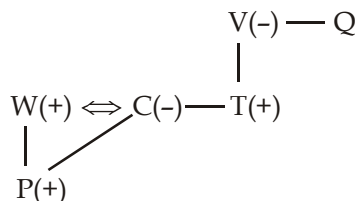
Hence V is mother-in-law of W.

Direction (13-15)

13. (e):

P(+)

↓

T(–)

↓

K(+) —— L
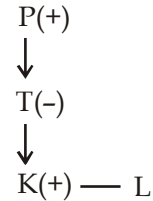
There is no information about the gender of L. Hence we can't determine the relation between L and P.

14. (c):

Q(+) —— W(–) ⟺ S(+)

N(+)
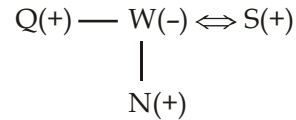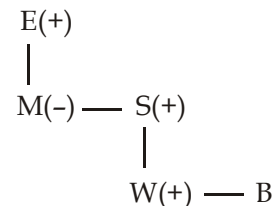
Hence W is sister of Q.

15. (d):

A(+)—— B(–) ⟺ F(+)

D(+)
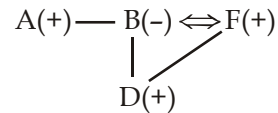
Directions (16-18)

16. (e):

M(+)

R(+) ⟺ Q(–) —— V(+) —— L

17. (b):

E(+)

M(–) —— S(+)
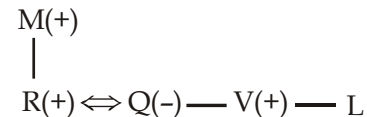
W(+) —— B

Hence E is grandfather of B.

18. (e):

A(+)

B(–) —— C(+)

D(+) —— E
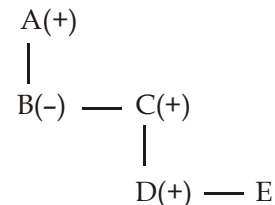
B is paternal aunt of E.

Directions (19-23)

Family tree

A(–) ⟺ F(+)

E(–) ⟺ C(+) —— G(–)

D   B(–)
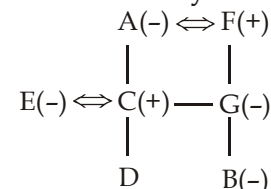
19. (a)   **20. (d)**   **21. (d)**   **22. (b)**   **23. (b)**

Directions (24-25)

24. (c):

$$F(+)$$
$$|$$
$$C(-) \Longleftrightarrow D(+) — E(-) — H$$
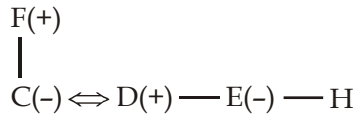
E is sister-in-law of C.

25. (a):

$$V(+) — L(-) \Longleftrightarrow M(+)$$
$$\downarrow$$
$$P$$
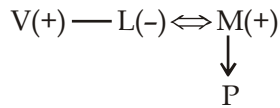
Hence V is maternal uncle of P.

Directions 26

26. (c):

$$N(+) = P(-)$$
$$|$$
$$R(+) — T(-) = M(+) — L(-)$$
$$\qquad\quad | \qquad\quad |$$
$$\qquad\quad V(-) — K(-)$$
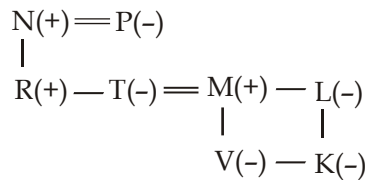
Hence M is son-in-law of P.

Directions (27-29):

27. (d):

C —————— B(-)
| |
A(+)   E(-) ═══ D(+)

28. (a):

A ——— C(-) ═══ E(+)
         | |
      (+)D   (+)F ——— L(-)

29. (e):

A
|
F(-) ——— E(-) ═══ B(+)
                        |
                        D
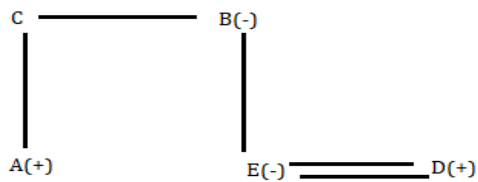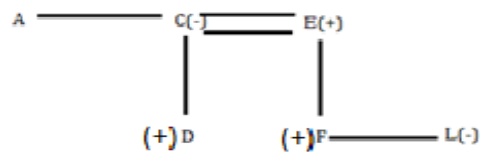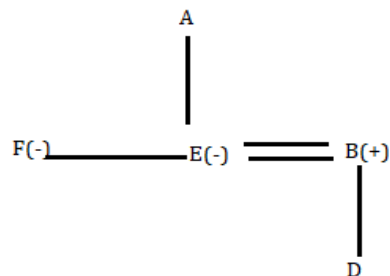
With respect to age: F<E<A.

Directions (30-33):

30. (d):

A ——— B(+)
            |
         C(-) ——— D(+) ═══ E(-)

31. (d):

N(-)
|
M(+)   R(-) — S(+)
|
L

32. (a):

D(+) ═══ E(-)
              |
B(-) ——— C(+)
|
A

33. (e):

L   S(-)
| |
M(-) — N(+) ═══ R(-)

Directions (34-36):

34. (a):

A(-)
|
B(+)   D(+)
| |
C(-) ═══ H(+)

35. (e):

K(+) ═══ G(-)   J
| | |
F(-)   H(-) ═══ (+)

36. (e):

L(+)
|
M(-) ═══ P(+)
| |
N(-)   R(+)
                 |
                 S
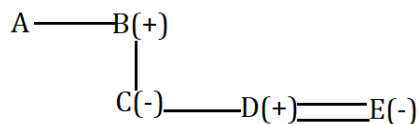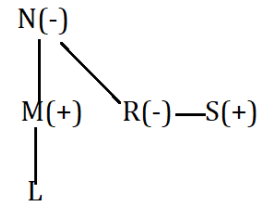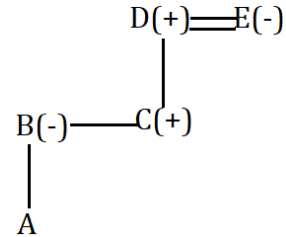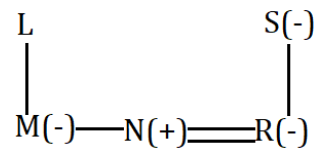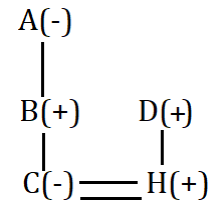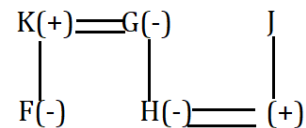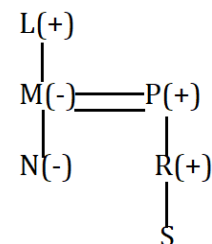
Directions (37-39):

37. (b):

(M)
|
[S] — [R] — G

38. (c):

[P] — (Y) ═══ [K]
        |
       [G]
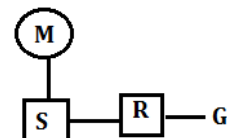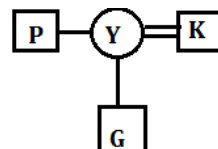
39. (c):
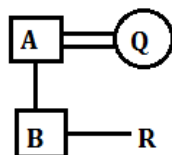
Directions (40-43):

40. (d):

$$Q(+)$$
$$|$$
$$R(+) = P(-) - S - T(+)$$

41. (d):

$$Q(+)$$
$$|$$
$$R(-) - S(+)$$
$$|$$
$$T - M(+)$$

42. (b):

$$J(+) = K(-) - L - N(+) - M(+)$$

43. (e):

$$J(+) = K(-) - L - N(+) - M(+)$$
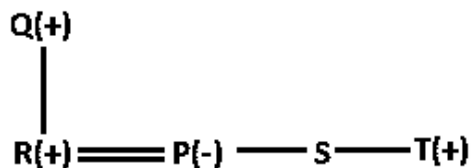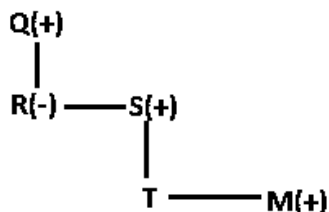
Directions (44-45):

44. (e):

45. (d):

$$Q(+) - S(+)$$
$$|$$
$$P(+) - L$$
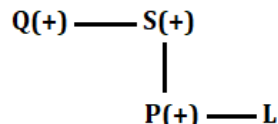
Direction (46-47):

46. (b):

$$P(+) = Q(-)$$
$$|$$
$$N(-)$$
$$|$$
$$J(+) - K$$

47. (d):

$$Y(+) = Z(-)$$
$$|$$
$$X(+) - W(+)$$
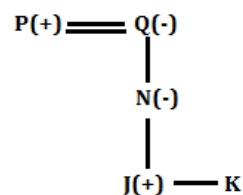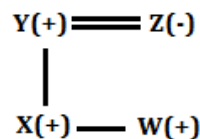
Direction (48-49):

48. (c):

$$W(+) = R(-)$$
$$|$$
$$F(-)$$
$$|$$
$$E(-) - G$$
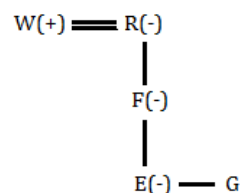
49. (b):

◀ **Previous Year (Memory Based)** ▶

Directions (1-3):

Family tree

$$M$$
$$|$$
$$Y(+) \Leftrightarrow T(-) - D(-) \Leftrightarrow P(+)$$
$$\diagup \diagdown \qquad |$$
$$J(+) \quad U(-) \qquad Q(+)$$
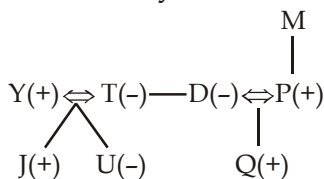
1. (c):   **2. (d):**   **3. (b):**

Directions (4-5):

Family tree

$$D(+) \Leftrightarrow P(-) \qquad L$$
$$| \qquad | \qquad |$$
$$A(+) - J(-) \Leftrightarrow U(+)$$
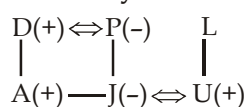
4. (e):   **5. (b):**

Directions (6-9):

$$D(+) \Leftrightarrow K(-)$$
$$\diagup \diagdown$$
$$Y(-) - J(+) \Leftrightarrow L(-) \quad (+)$$
$$|$$
$$R(+)$$

6. (b):   **7. (a):**   **8. (d):**

9. (a):

$$K$$
$$|$$
$$L(-) \Leftrightarrow D(+)$$
$$|$$
$$B(+) \Leftrightarrow T(-)$$
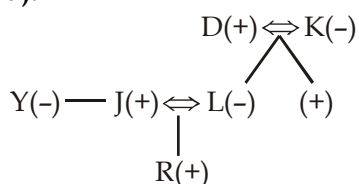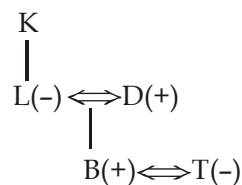
Hence D is father-in-law of T.

Directions (10-12):

$$B(+) \Leftrightarrow J(-) - T(-) \Leftrightarrow D(+)$$
$$| \qquad\qquad |$$
$$L(-) \qquad\qquad R(+) \Leftrightarrow H(-)$$
$$|$$
$$M(+)$$
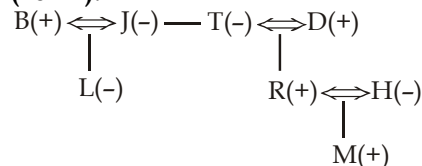
10. (a)   **11. (e)**   **12. (b)**

Directions (13-15):

$$M(+) \Leftrightarrow X(-)$$
$$\diagup \diagdown$$
$$Q(+) \quad P(-) \Leftrightarrow S(+)$$
$$\diagup | \diagdown$$
$$Y(+) \quad K \quad A(+)$$
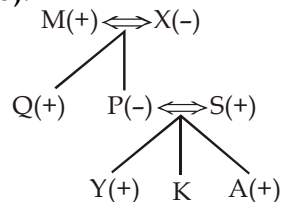
13. (a)   **14. (d)**   **15. (a):** Either nephew or niece

Directions (16-18)

```
              J(+)
               |
M(-)⟺A(+)
       ↙      ↘
B(+) — N(+)⟺C(-)
         |
         Q
```
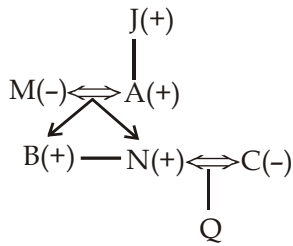
16. (d)   **17. (c)**   **18. (e)**

Directions (19-20)

```
     (+)A ⟺ D(-)
            |
     (-)H — C(+)
            |
          B(-)
```
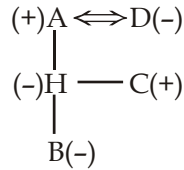
19. (c)   **20. (b)**

Directions (21-23)

21. (c)

```
     N(+)
      |
R — S(-) — T
```
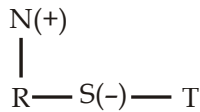
Hence, R is either brother or sister of S.

22. (a)

```
     V(-)
      ↓
W(+) — M(+)
         |
       Y(-) — S
```
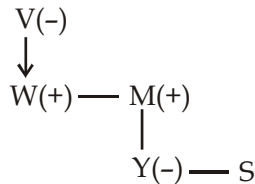
Hence, V is grandmother of Y.

23. (d)

```
     N(+)
      |
     O(-)
      |
     T(+) — L
```
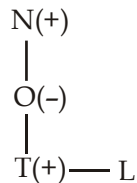
We don't know the gender of L.

Directions (24-26)

24. (a)

```
     D(-) ⟺ F(+)
      |
     C(-) — H(-) ⟺ J(+)
```
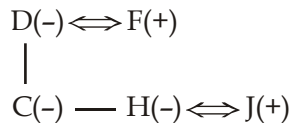
Hence C is siter-in-law of J when F is father of H.

25. (c)

```
     V(+)⟺K(-)
        ↘
P(-)⟺M(+)—W(-)
  |
 L(-)
```
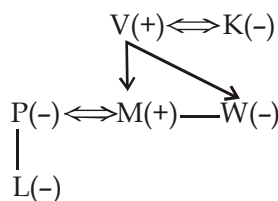
Hence, K is mother-in-law of P.

26. (d)

```
     Q(+)⟺P(+)
      |      |
     T(+) — R(-) ⟺ S(+)
```
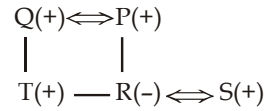
Hence, R is sister of T.

27. (a)

```
              T
              |
     Q(+) — R(+)
      |
     P(+)
```
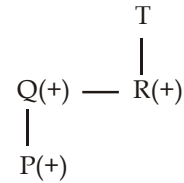
Hence, R is paternal uncle of P.

28. (c)

```
     (-)Q ⟺ M(+)
            |
     (+)L — R(+)
```
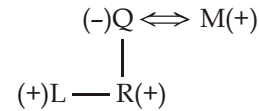
Hence, M is father of L.

29. (e)

```
     (-)Q ⟺ R(+) — S
            |
         (+)P
```

P is nephew of S.

30. (c)

```
              (+)T — R
                 |
(+)Q — P(+) — V(+)
```
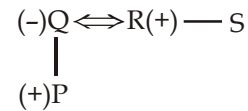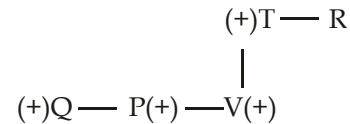
Hence, T is father of Q.

Direction (31-33):

```
     (-)A                    L
      |                      |
     (+)P — G ═ K — S(-)
                    |
                    M
```
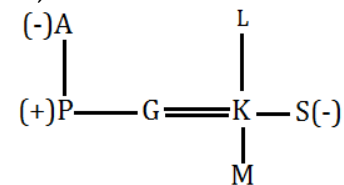
31. (e):   **32. (a):**   **33. (b):**

Direction (34-36):

```
              F(+)
               |
A(+)═D(-) — E(+) — B(-)═C(+)
     |                  |
    G(-)               H(+)
```
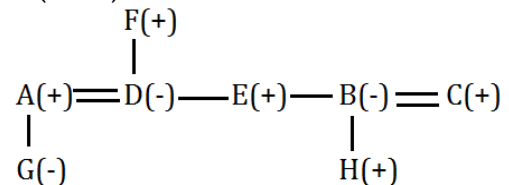
34. (c):   **35. (d):**   **36. (c):**

Direction (37-41):

```
        (F-)           (S-)
         |              |
(C-) — (D-) ═ (B+) — (A+)
               |
              (G+) — (H-)
```
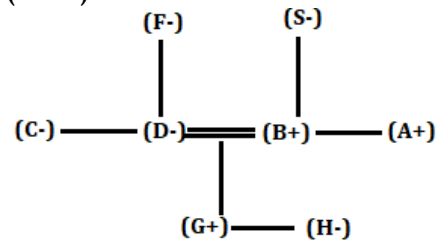
37. (b):   **38. (b):**   **39. (c):**   **40. (e):**   **41. (b):**

Direction (42-43):

M(-) P(-)
| |
H(+) ══ K(-) ── B
|
F(+) ══ G(-)
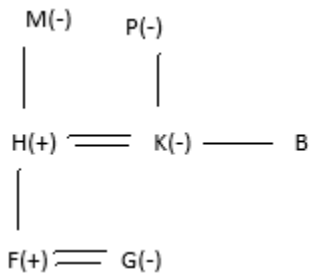
42. (e): **43. (d):** **44. (d):**

Direction (45-46)

R(-)══D(+) W(+)
| |
J(+) ── L(-) ══ Q(+)
| |
P(+) N
|
C(-)

45. (e): **46. (c):** **47. (e):**

P══R
|
S(-) ══ U(+) ── Q(+)
|
T(-)

Direction (48-50):

F(+)
|
A(+)══D(-)──E(+)──B(-)══C(+)
| |
G(-) H(+)

48. (c): **49. (d):** **50. (c):**

F(+)══P(-)
|
A(+)══D(-)──E(+)── B(-)══C(+)
| |
G(-) H(+)

Direction (51-53):

P(-) ══ R(+)
|
Q(-) ══ L(+) ── G(-)
|
M(+) ── O(-)

51. (d): **52. (a):**

P(-) ══ R(+)── F(+)
|
Q(-) ══ L(+) ── G(-)
|
M(+) ── O(-)

53. (c):

Direction (54-55):

R(+)
|
H(+) ══ M(-)
|
V(-) ══ B(+) ── A(-) ── C(-)

54. (b): **55. (c):**

...·ೞ಄ೞ಄ೞ಄ೞ·...