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PAPER 1

IBPS RRB PO Mains Solved Paper 2024

REASONING ABILITY

1. In the question given below, a statement is followed by two conclusions I and II. Read the statement carefully and decide which of the given conclusions logically follow(s).
Statement: A multinational company has decided to allow employees to work from home permanently. The management stated that this would save infrastructure costs and increase employee satisfaction.
Conclusions:
I. Permanent work from home policies reduce infrastructure costs for companies.
II. All employees are more productive when working from home.
(*a*) Only I follows (*b*) Only II follows
(*c*) Both I and II follow (*d*) Neither I nor II follows
(*e*) None of these

2. **Statement:** The education department announced that from next year, all school exams will be conducted digitally to promote transparency, reduce paperwork, and standardize the evaluation process.
What can be concluded from the statement?
(*a*) Digital exams will completely eliminate the need for teachers.
(*b*) Students will now cheat less in online exams.
(*c*) The department wants a more efficient and uniform assessment system.
(*d*) Online exams are easier than traditional exams.
(*e*) None of these

3. In the questions given below, a statement is followed by two assumptions I and II. An assumptions is something supposed or taken for granted. You have to consider the following assumptions and decide which of the assumption(s) is implicit in the statement.
Statement: "To encourage digital transactions and reduce dependency on cash, the government has launched a cashback scheme for users who make payments using UPI."
Assumptions:
I. People are more likely to use digital transactions if they receive monetary incentives.
II. Cash-based transactions are less desirable from the government's perspective.
(*a*) Only I is implicit (*b*) Only II is implicit
(*c*) Both I and II are implicit (*d*) Neither I nor II is implicit
(*e*) Either I or II is implicit

Directions (4-6): Study the following information carefully and answer the questions given below.

There are nine members in a family of three generations. No single person in the family is a parent. M is sister of P. N is son of R, who is sister-in-law of Q. F is mother of Q. T is nephew of S. U is father-in-law of P. U is in the 1st generation. P is not a female member. S is not sibling of M.

4. Which of the following statements is true?
I. M is the sister of P.
II. F is the father of Q.
III. There are three married couples in the family.
(*a*) Only I (*b*) Only III
(*c*) Both I and III (*d*) Both II and III
(*e*) Only II

5. How is U related to T?
(*a*) Father (*b*) Paternal Grandfather
(*c*) Maternal Grandfather (*d*) Father-in-law
(*e*) Cannot be determined

6. If B is the sister of U, then how many female members are there in the family?
(*a*) Five (*b*) Seven
(*c*) Six (*d*) Four
(*e*) Can't be determined

Directions (7-11): Study the following information carefully and answer the questions given below.

Nine employees - David, Emma, Felix, Grace, Hannah, Isaac, Julia, Kevin, and Liam work in a company and were born in nine different years 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, and 1999, but not necessarily in the same order. Each of them has children of nine different ages 4, 5, 6, 7, 8, 9, 10, 11, and 12.

The one who was born in 1993 has a child who is 11 years old. Julia was born in a year that is divisible by both three and four. Hannah is the oldest. Grace was born in a year that is divisible by both three and two but not by four. David was born in a prime-numbered year and not after 1995. Julia's child has the third highest age among the children. The one who has a child of 7 years of age was the second last to be born among them. Isaac is the youngest among the workers and he has a child with the second lowest age among the children. Hannah's child has the highest age among the children. Emma was born in an odd-numbered year that is divisible by three. The child who is 4 years old has a parent who was born in a prime -numbered year. Liam and Kevin were born in even-numbered years after 1993. Kevin has a 6 years old chid and he was born in the fourth highest year among them. Liam has a child with an age of the highest one-digit number.

7. Who was born in a year that is divisible by both three and four, and what is his children's age?
(*a*) Julia,11 (*b*) Hannah,12
(*c*) Hannah,8 (*d*) David,11
(*e*) Julia,10

8. What was the birth year of Julia, and how old is Julia's child?
(*a*) 1992, 11 (*b*) 1992, 10
(*c*) 1991, 11 (*d*) 1995, 4
(*e*) 1996, 8

9. The one who has a child of 7 years old, was born in which of the following year?

(*a*) Three years after 1991 (*b*) Three years after 1996

(*c*) Two years after 1996 (*d*) Two years before 1995

(*e*) Two years before 1993

10. What is the age of the child of the one who was born in the year 1994?

(*a*) 4 years (*b*) 5 years

(*c*) 6 years (*d*) 7 years

(*e*) 8 years

11. In which year was Felix born?

(*a*) Two years before 1999 (*b*) One year before 1992

(*c*) Two years after 1993 (*d*) Three years before 1998

(*e*) Five years after 1994

12. The question given below consists of two statements numbered I and II. You have to decide whether the data provided in the statements is sufficient to answer the question. Read all the statements and answer the question.

Eight persons - P, Q, R, S, T, U, V and W live in an eight-storey building, but not necessarily in the same order. The bottommost floor is numbered as 1 and the topmost floor is numbered as 8.

Who lives exactly between T and U?

Statement I: Two persons live between R and P. W lives two floors above P. Q lives just above W. As many persons live above Q as below V. U lives just above S.

Statement II: Three persons live between Q and U. V live two floors below S. S lives just below U. Four persons live between R and W, who lives adjacent to Q's floor. At least 2 persons live between T and S.

(*a*) Data given in statement I alone is sufficient to answer the question.

(*b*) Data given in statement II alone is sufficient to answer the question.

(*c*) Data given in either statement I or statement II alone is sufficient to answer the question.

(*d*) Data given in both the statement I and statement II together are sufficient to answer the question.

(*e*) Data given in both the statement I and statement II together are not sufficient to answer the question.

13. The question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a 'strong' argument and which is a 'weak' argument.

Statement: Should consumers buy more expensive cold-pressed oils over cheaper refined cooking oils?

Arguments:

I. No, because cold-pressed oils are mostly produced locally, whereas refined oils are imported from other countries.

II. Yes, because cold-pressed oils are less processed and much healthier than refined cooking oils.

(*a*) Only argument I is strong (*b*) Only argument II is strong

(*c*) Either I or II is strong (*d*) Neither I nor II is strong

(*e*) Both I and II are strong

14. In the question given below, a passage/statement is followed by three statements which may or may not strengthen/weaken the assertion made in the passage. Answer the questions as per the individual direction given.

Automobile major Mahindra & Mahindra Ltd. plans to set up an electric vehicles manufacturing facility in Pune, Maharashtra. The company, through its subsidiary, will make investments of approximately Rs. 10,000 crore over a period of 7-8 years for setting up the factory. It also plans to hire the staff locally after the completion of the project.

Which of the following, if true, would strengthen the argument made in the above passage?

I. The electric vehicles market, though still in its infancy in India, is expected to grow vigorously in about a decade as conventional vehicles are phased out.

II. Maharashtra government's new industrial promotion plan has provisions for providing 5-years tax relief for companies establishing new factories.

III. While Maharashtra's literacy rate is marginally above the national average, it has a shortage of the technical workforce required in the automobile industry.

(*a*) Only I and II (*b*) Only I and III

(*c*) Only II and III (*d*) Only II

(*e*) All I, II and III

15. The question given below consists of two statements numbered I and II. You have to decide whether the data provided in the statements is sufficient to answer the question. Read all the statements and answer the question.

A few cars are parked at a certain distance from one another. What is the direction of Car K with respect to Car P?

Statement I: L is 30m north of O. N is west of L. P is 18m south of N. K is to the southwest of N.

Statement II: N is 15m west of L. O is 15m east of M. P is north of M. K is to the west of O.

(*a*) Data given in both statement I and II together are not sufficient to answer the question.

(*b*) Data given in statement II alone is sufficient to answer the question, while data given in statement I alone is not sufficient to answer the question.

(*c*) Data given in statement I alone is sufficient to answer the question, while data given in statement II alone is not sufficient to answer the question.

(*d*) Data given in both statement I and II together are necessary to answer the question.

(*e*) Data given in either statement I or statement II alone is sufficient to answer the question.

Directions (16-19): In the following questions, assuming the given statements to be true, find which among the given five conclusions is/are definitely true and then give your answer accordingly.

16. Statements: $A \geq F \geq M$; $P = S > R = Q < M$; $P \leq N \leq Z$

Conclusions:

I. $A > P$

II. $Z \leq Q$

III. $F \geq N$

IV. $R < A$

V. $Q < Z$

(*a*) Only IV and V (*b*) Only II and IV

(*c*) Only I, II and V (*d*) Only I and IV

(*e*) Only II, III and V

17. Statements: $E \geq S = R$; $M \leq K < R$; $X = V \leq P = M \geq Z$

Conclusions:

I. $E > P$

II. $K \geq X$

III. $Z < S$

IV. $R \leq V$

V. $K > E$

EXPLANATION

1. (*a*) Conclusion I is directly supported by the statement — the policy aims at saving infrastructure costs.

Conclusion II is not stated or implied. Productivity varies and is not generalized in the statement.

So, only conclusion I follows.

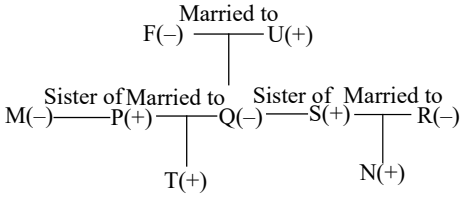
2. (*c*) The statement emphasizes transparency, less paperwork, and standardization, all pointing to a more efficient and uniform system.

3. (*c*) Assumption I is implicit because cashback incentives aim to motivate people toward digital transactions.

Assumption II is implicit as the purpose is to reduce dependence on cash, showing it's less desirable.

So, both I and II are implicit.

Solutions (4-6):



4. (*c*) Statement I: M is the sister of P – True
Statement II: F is the father of Q. – False
Statement III: There are three married couples in the family. – True

5. (*c*) U is maternal grandfather of T.

6. (*a*) There are five female members in the family.

Solutions (7-11):

Year	Employee	Age of Children
1991	Hannah	12
1992	Julia	10
1993	David	11
1994	Kevin	6
1995	Emma	8
1996	Liam	9
1997	Felix	4
1998	Grace	7
1999	Isaac	5

7. (*e*) The year that is divisible by both three and four is 1992. Julia was born in that year and he has a child of 10 years old.

8. (*b*) Julia was born in the year 1992, and he has a child of 10 years old.

9. (*c*) The one who has a child of 7 years old, was born in 1998, that was two years after 1996.

10. (*c*) The age of the child of the one who was born in the year 1994 is 6 years.

11. (*a*) The Felix was born in 1997, that was two year before 1999.

12. (*c*) From statement I alone, we get:

Floor	Person
8	Q
7	W
6	T
5	P
4	U
3	S
2	R
1	V

P lives exactly between T and U.
So, data given in the statement I alone is sufficient to answer the given question.
From statement II alone, we get:

Floor	Person
8	Q
7	W
6	T
5	P
4	U
3	S
2	R
1	V

P lives exactly between T and U.

So, data given in the statement II alone is sufficient to answer the given question.

So, data given in either statement I or statement II alone is sufficient to answer the given question.

13. (*b*) The statement asks whether consumers should prefer cold-pressed oils over refined cooking oils. II is a strong argument, as it explains that cold-pressed oils are much healthier than their refined counterparts.

14. (*a*) The passage tells us how the company plans to establish an electric vehicles plan in Maharashtra over the next 7-8 years.

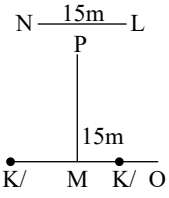
I will strengthen the company's argument as it tells us how the electric vehicle market will expand over the next ten years.

II will also strengthen the company's argument as it tells us how the company will benefit from Maharashtra's 5-years tax relief.

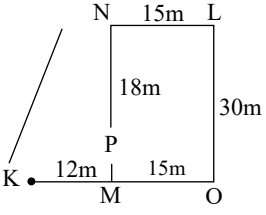
III tells us how there is a talent shortage in Maharashtra, and will weaken the company's argument about hiring workers for its Pune plant locally.

15. (*d*) From statement I alone, we cannot determine the position of Car K with respect to Car P.

From statement II:



From statement II alone, we cannot determine the position of Car K with respect to Car P.
Combining statement I and II, we get:



From statement I and II together, we get Car K is in the southwest of Car P.
Therefore, data given in both statements I and II together are necessary to answer the question.

16. (*a*) On combining, we get,

$A \geq F \geq M > Q = R < S = P \leq N \leq Z$

Conclusions:

I. $A > P$: False (As, $A \geq F \geq M > Q = R < S = P$, so, the relation between A and P cannot be determined)

II. $Z \leq Q$: False (As, $Q = R < S = P \leq N \leq Z$, so, $Q < Z$)

III. $F \geq N$: False (As, $F \geq M > Q = R < S = P \leq N$, so, the relation between F and N cannot be determined)

IV. $R < A$: True (As, $A \geq F \geq M > Q = R$, so, $A > R$)

V. $Q < Z$: True (As, $Q = R < S = P \leq N \leq Z$, so, $Q < Z$)

Therefore, only conclusions IV and V are definitely true.

PAPER
2

IBPS RRB PO Prelims Solved Paper 2024

REASONING ABILITY

Directions (1-5): Study the following information carefully and answer the questions given below:

Fourteen persons sit in two parallel rows. Aarav, Bhavya, Charu, Divya, Esha, Farhan, Gaurav sit in row-1 facing north and Priya, Qasim, Rahul, Sneha, Tanya, Utkarsh, Vikram sit in row-2 facing south such that the persons sitting in row-1 face the persons sitting in row-2.

Vikram is the only immediate neighbour of Sneha. Tanya sits second to the left of Vikram. Two persons sit between Tanya and the one who faces Farhan. Aarav sits exactly between Bhavya and Charu, who sits diagonally opposite Rahul. Aarav does not face Vikram. Priya faces Divya. Gaurav faces the one who sits just to the right of Utkarsh. Esha does not face Tanya.

1. Who sits second to the right of the one who faces Bhavya?

(*a*) Priya (*b*) Qasim (*c*) Rahul (*d*) Sneha

(*e*) Utkarsh

2. Four of the following five are alike in a certain way and hence form a group. Which of the following does not belong to that group?

(*a*) Vikram (*b*) Aarav (*c*) Utkarsh (*d*) Gaurav

(*e*) Farhan

3. The number of persons sitting between Qasim and Rahul is the same as the number of persons sitting to the left of _____.

(*a*) Gaurav (*b*) Divya (*c*) Utkarsh (*d*) Charu

(*e*) Vikram

4. If Utkarsh is related to Qasim in a certain way, and Bhavya is related to Farhan in the same way, to whom is Aarav related?

(*a*) Esha (*b*) Divya (*c*) Bhavya (*d*) Farhan

(*e*) Charu

5. Which of the following statements is true?

(*a*) Priya sits diagonally opposite Farhan.

(*b*) More than one person sits between Divya and Gaurav.

(*c*) Priya does not sit just to the left of Utkarsh.

(*d*) Farhan sits at one of the extreme ends.

(*e*) None is true

Directions (6-8): In these questions, the relationship between different elements is shown in the statements. The statements are followed by conclusions. Study the conclusions based on the given statements and select the appropriate answer:

(*a*) If only conclusion I is true.

(*b*) If only conclusion II is true.

(*c*) If either conclusion I or II is true.

(*d*) If neither conclusion I nor II is true.

(*e*) If both conclusions I and II are true.

6. Statements: $A > B = C \geq D < E, F \leq D > G$

Conclusions:

I. $A > E$

II. $G < A$

7. Statements: $P = U \leq V > W < X \leq Y, Z < Y = A$

Conclusions:

I. $W < A$

II. $W \geq Y$

8. Statements: $P \geq Q \geq R = S > T \leq U < V \leq W$

Conclusions:

I. $Q < S$

II. $U < R$

9. In the number '657412862', how many pairs of the digits have the same number of digits between them (both forward and backward direction) in the number series?

(*a*) Four (*b*) Two (*c*) One (*d*) Three

(*e*) More than four

Directions (10-12): Study the following information carefully and answer the questions given below:

B is the only daughter of C, who is the mother-in-law of F. D is the paternal grandfather of B's nephew. D has two sons, one daughter and no siblings. J is the sister-in-law of E. F is the mother of K, who is a married male. H is the uncle of E, who is not a daughter of G. A is the aunt of G, who is a sibling of B and H.

10. How is B related to K?

(*a*) Mother (*b*) Aunt (*c*) Uncle (*d*) Mother-in-law

(*e*) None of these

11. Which of the following is true?

(*a*) G is the daughter of D. (*b*) K is the son of J.

(*c*) H is the A's nephew. (*d*) D is the F's father.

(*e*) All are true

12. Four of the following five are alike in a certain way and hence form a group. Which of the following does not belong to that group?

(*a*) K (*b*) E (*c*) A (*d*) H

(*e*) D

Directions (13-17): Study the following information carefully to answer the given questions:

Ten females Nisha, Oorja, Pooja, Qamra, Riya, Sneha, Tanya, Urvi, Vidya, and Warda, are living in a five-story building such as ground floor is numbered as 1, the floor above it is numbered 2, and the top floor is numbered as 5. Each of the floor has 2 flats in it viz. flat-X and flat-Y. Flat-X of floor-2 is immediately above flat-X of floor-1 and immediately below flat-X of floor-3 and so on. In the same way flat-Y of floor-2 is immediately above flat-Y of floor-1 and immediately below flat-Y of floor-3 and so on. Flat-X is in the west of flat-Y.

30. The number of students born between T and V is the same as the number of students born between _____ and _____.

(*a*) P, S (*b*) X, V (*c*) R, W (*d*) Q, P

(*e*) None of these

31. Who was born two months after T?

(*a*) X (*b*) Q (*c*) R (*d*) S

(*e*) None of these

32. Find the odd one out:

(*a*) ACGM (*b*) BDHN (*c*) CEIP (*d*) DFJP

(*e*) EGKQ

Directions (33-35): Study the given information carefully to answer the given questions.

There are seven students – K, L, M, N, X, Y, and Z, of different heights. L is taller than N but shorter than M. Y is taller than L, but not the tallest. Only four students are shorter than Z. Z is shorter than M. X is shorter than L, but not the shortest. N is neither the shortest nor 3rd shortest. The third -highest person's height is 180 cm.

33. Who among the following is the fourth shortest person?

(*a*) Y (*b*) N (*c*) L (*d*) Z

(*e*) None of these

34. If the Y's height is 40 cm more than Z, and the difference in height between X and Y is 100 cm, then what is the possible height of L?

(*a*) 194 cm (*b*) 118 cm (*c*) 180 cm (*d*) 135 cm

(*e*) 119 cm

35. How many students are shorter than the one who is just taller than X?

(*a*) Three (*b*) One (*c*) None (*d*) Two

(*e*) None of these

Directions (36-40): Study the following information carefully and answer the questions given below.

Seven employees– Mohit, Nandini, Ojas, Priya, Qasim, Rohan, and Sneha, sit in a row and all of them facing towards the north direction. Each of them likes a different fruits, viz. Kiwi, Papaya, Cherry, Strawberry, Guava, Pomegranate, and Blueberry. The information given is not necessarily in the same order.

Rohan sits third to the right of Ojas, who likes Cherry. Rohan sits second to the left of Qasim. The one who likes Papaya sits at one of the extreme ends of the row. Priya sits third to the right of the one who likes Guava. Only two employees sit between Nandini and Qasim. Rohan doesn't like Blueberry. Sneha sits fourth to the left of Rohan. The one who likes Kiwi sits second to the right of Nandini, who likes neither Blueberry nor Pomegranate. Sneha doesn't sit to the right of the one who likes Papaya.

36. Which of the following fruits does Priya like?

(*a*) Papaya (*b*) Pomegranate

(*c*) Kiwi (*d*) Guava

(*e*) None of these

37. Who among the following likes Blueberry?

(a) Sneha (b) Mohit (c) Qasim (d) Priya

(e) None of these

38. Which of the following pairs sit at the extreme ends?

(*a*) Mohit, Nandini (*b*) Qasim, Priya

(*c*) Qasim, Nandini (*d*) Mohit, Qasim

(*e*) None of these

39. Which of the following is true?

I. Priya sits 2nd to the right of the one who likes Cherry.

II. Ojas and Mohit are immediate neighbours.

III. Sneha sits 2nd to the left of the one who likes Guava.

(*a*) Only I (*b*) Both II and III

(*c*) Only III (*d*) Both I and II

(*e*) Only II

40. What is the position of the one who likes Kiwi to the one who likes Papaya?

(*a*) 2nd to the right (*b*) Immediate right

(*c*) 4th to the right (*d*) 2nd to the left

(*e*) Immediate left

QUANTITATIVE APTITUDE

Directions (41-46): What will come in the place of the question mark (?) in the following number series?

41. 461, ?, 1020, 1145, 1209, 1236

(*a*) 773 (*b*) 1090 (*c*) 586 (*d*) 804

(*e*) 1261

42. 150, 133, 120, 109, 102, ?

(*a*) 97 (*b*) 103 (*c*) 85 (*d*) 101

(*e*) 80

43. 34, ?, 49, 69, 109, 189

(*a*) 34 (*b*) 47 (*c*) 39 (*d*) 32

(*e*) 38

44. 3.5, 21, 105, 420, ?, 2520

(*a*) 1260 (*b*) 1050 (*c*) 600 (*d*) 750

(*e*) 1200

45. 18, 19, 40, 123, ?, 2485

(*a*) 500 (*b*) 496 (*c*) 502 (*d*) 406

(*e*) 310

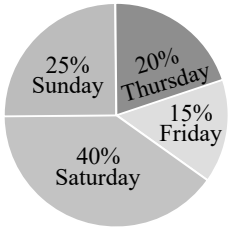
46. 76, 114, 171, 247, ?, 456

(*a*) 342 (*b*) 320 (*c*) 356 (*d*) 328

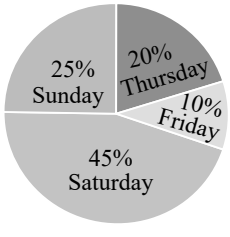
(*e*) 364

Directions (47-52): The pie chart (I) shows the percentage distribution of the total number of orders delivered by Flipkart and Amazon together on four different days. The pie chart (II) shows the percentage distribution of the total number of orders delivered by Flipkart on these days. Read the following pie charts carefully and answer the questions given below.

(I) Total orders delivered by Filpkart and Amazon together = 1440



(II) Total orders delivered by Flipkart = 1080



EXPLANATION

Solutions (1-5):

Sneha Vikram Qasim Tanya Utkarsh Priya Rahul

Row-2

Row-1

Charu Esha Aarav Gaurav Bhavya Divya Farhan

1. (*b*) Qasim sits second to the right of the one who faces Bhavya.

2. (*e*) Farhan sits at the end of the row.

3. (*a*) The number of persons sitting between Qasim and Rahul is the same as the number of persons sitting to the left of Gaurav.

4. (*c*) As, Utkarsh sits second to the left of Qasim.
Similarly, Aarav sits second to the left of Bhavya.

5. (*d*) Farhan sits at one of the extreme ends.

6. (*b*) I. A > E (False) {∵ A > C ≥ D < E}
II. G < A (True) {∵ A > C ≥ D > G}
So, only conclusion II is true.

7. (*a*) I. W < A (True) {∵ W < X ≤ Y = A}
II. W ≥ Y (False) {∵ W < X ≤ Y }
So, only conclusion I is true.

8. (*d*) I. Q < S (False) {∵ Q ≥ R = S}
II. U < R (False) {∵ R = S > T ≤ U}
So, neither conclusion I nor II is true.

9. (*d*) 6 5 7 4 1 2 8 6 2

So, three pairs – 12, 24, 56.

Solutions (10-12):

A (–) — C (–) = D (+)
|
F (–) = G (+) — B (–) — H (+)
|
E (+) — K (+) = J (–)

10. (*b*) B is the aunt of K.

11. (*c*) H is the A's nephew.

12. (*c*) Except A all are males.

Solutions (13-17):

Floor	Flat-X	Flat-Y
5	Qamra	Pooja
4	Sneha	Urvi
3	Nisha	Warda
2	Vidya	Tanya
1	Riya	Oorja

13. (*c*) Vidya lives in flat-X of the 2nd floor.

14. (*a*) Sneha and Tanya lives on an even numbered floor.

15. (*b*) Riya lives in flat-X, of floor 1.

16. (*b*) Three floors are between Qamra and Oorja, who lives just below Tanya's flat.

17. (*c*) All live in flat-Y except Sneha.

18. (*a*) Meaningful word formed is CART.
So, 'A' will be the second letter.

Solutions (19-22):

Word	Code
happy/not	xa/pb
smart	qr
strong	wx
quick	uv
brave	st
clever	mn
agile	yz

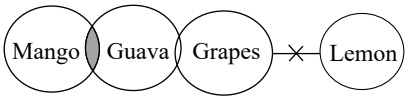
19. (*b*) "brave" is coded as "st".

20. (*e*) "happy" is coded as either xa or pb.

21. (*c*) "smart" is coded as "qr".

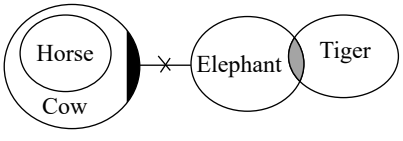
22. (*a*) Possible code for "happy strong" is "xa wx".

23. (*b*)



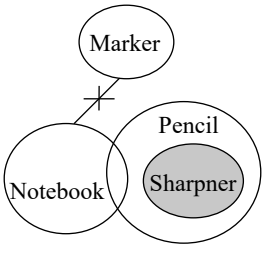
So, only conclusion II follows.

24. (*a*)



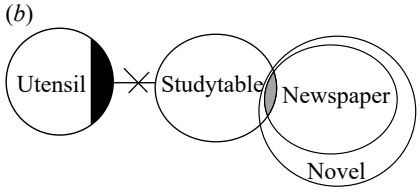
So, only conclusion I follows.

25. (*a*)



So, only conclusion I follows.

26 (*b*)



So, only conclusion II follows.

Solutions (27-31) :

Months	Students
January	P
March	U
April	R
May	T
July	S
August	X
September	Q
October	W
December	V

27. (*e*) X was born in August.

28. (*a*)Three students were born between U and X.

29. (*b*) W was born in October.

30. (*c*) The number of students born between T and V is 4 that same as the number of students born between R and W.

31. (*d*) S was born two months after T.

32. (*c*) As, A $\xrightarrow{+2}$ C $\xrightarrow{+4}$ G $\xrightarrow{+6}$ M
And, B $\xrightarrow{+2}$ D $\xrightarrow{+4}$ H $\xrightarrow{+6}$ N
And, D $\xrightarrow{+2}$ F $\xrightarrow{+4}$ J $\xrightarrow{+6}$ P
And, E $\xrightarrow{+2}$ G $\xrightarrow{+4}$ K $\xrightarrow{+6}$ Q
But, C $\xrightarrow{+2}$ E $\xrightarrow{+4}$ I $\xrightarrow{+7}$ P (Odd one)

Solutions (33-35):

M > Y > Z (180 cm)> L > X > N > K

33. (*c*) L is the fourth shortest person.

34. (*d*) X's height = (180 + 40) – 100 = 120 cm
So, L's height will be between 180 cm and 120 cm.
The possible height of L is 135 cm.

35. (*a*) Three students are shorter than L, who is just taller than X.

Solutions (36-40):

Sneha Ojas Mohit Nandini Rohan Priya Qasim

Blueberry Cherry Guava Strawberry Pomegranate Kiwi Papaya

CHAPTER

9

Ages and Average

AVERAGE

We're all familiar with the idea of average to some extent. One of the parts with the simplest questions is the average quantitative aptitude section, but occasionally the questions are framed in a tricky manner, so it is essential to be fully aware of all the important concepts.

⇒ **Average:** The average is defined as the mean value which is equal to the ratio of the sum of all the observations of a given set of values to the total number of observations present in the set.

$$\Rightarrow \text{Average} = \frac{\text{Sum of all observations}}{\text{Number of observations}}$$

How to Calculate Average?

We can quickly calculate the average for a given set of values. We just have to add all the values and divide the outcome by the number of given values.

Average can be calculated using three simple steps. They are:

Step 1: Sum of Numbers:

The first step in finding the average of numbers is to find the sum of all the given numbers.

Step 2: Number of Observations:

Next, we have to count how many numbers are in the given dataset.

Step 3: Average Calculation:

The final step in calculating the average is to divide the sum by the number of observations.

Example: An average of 31, 35, 41, 43, and 45

$$\Rightarrow \text{Here, average} = \frac{\text{Sum of number}}{\text{Total number of terms}}$$

⇒ Sum of all the number = (31 + 35 + 41 + 43 + 45) = 195

⇒ Number of terms = 5

$$\Rightarrow \text{Average} = \frac{195}{5} = 39$$

Types of Questions based on Averages

Let us see different types of questions that may come in the average section one by one:

1. **Mathematical Based on Averages:** Questions of this type are mathematically based, which may or may not be true in the real world.
2. **Real-life Based on Averages:** Questions of this type are real-life based, which is always based on real-world situations.

Averages Formula

Students can use the important average formulas given below to solve questions based on averages:

- Average of first n natural numbers = $\frac{(n+1)}{2}$
- Average of squares of first n natural numbers = $\frac{(n+1)(2n+1)}{6}$
- Average of cubes of first n natural numbers = $\frac{n(n+1)^2}{4}$
- Average of first n even numbers = $n + 1$
- Average of squares of first n even numbers = $\frac{2(n+1)(2n+1)}{3}$
- Average of cube of first n even numbers = $2n(n + 1)^2$
- Average of first n odd numbers = n
- Average of squares of first n odd numbers = $\frac{(2n+1)(2n-1)}{3}$
- Average of cube of first n odd numbers = $n(2n^2 - 1)$

Some Important Points:

1. If the value of each number is increased by the same value 'a', then the average of all numbers will also increase by 'a'.
2. If the value of each number is decreased by the same value 'a', then the average of all numbers will also decrease by 'a'.
3. If the value of each number is multiplied by the same value 'a', then the average of all numbers will also get multiplied by 'a'.
4. If the value of each numbers is divided by the same value 'a', then the average of all numbers will also get divided by 'a'.

AVERAGE OF A GROUP CONSISTING TWO DIFFERENT GROUPS WHEN THEIR AVERAGE ARE KNOW

Let group X contains m quantities and their average is x and group Y contains n quantities and their average is y, then Average of group Z containing these $(m + n)$ quantities = $\frac{(mx+ny)}{(m+n)}$

Weighted Average

If we have two or more groups of members whose individual averages are known, then the combined average of all the members of all the groups is known as weighted average. Thus if there are k groups having member of number $n_1, n_2, n_3, \ldots\ldots n_k$ with averages $A_1, A_2, A_3 \ldots\ldots A_k$ respectively then weighted average

$$A_w = \frac{n_1A_1 + n_2A_2 + n_3A_3 + \ldots + n_kA_k}{n_1 + n_2 + n_3 + \ldots + n_k}$$

Average Speed:

Average speed is define as total distance travelled divided by total time taken.

$$\text{Average speed} = \frac{\text{Total distance travelled}}{\text{Total time taken}}$$

Here, $n = 26$, $a = 300$, $b = 750$ and $c = 250$

According to formula,

Number of non-officers

$$\Rightarrow = \frac{n(a-b)}{(c-a)} = \frac{26(300-750)}{(250-300)} = \frac{26\times 450}{50} = 234$$

SHORTCUT TO FIND AVERAGE OR CHANGE IN AVERAGE FROM A SET OF VALUES

Example: The average of a batsman in 16 innings is 36. In the next innings, he is scoring 70 runs. What will be his new average?

(*a*) 44 (*b*) 38

(*c*) 40 (*d*) 48

(*e*) None of these

Solution: Conventionally solving: New average

$$= \frac{\text{(Old sum + New Score)}}{\text{Total number of innings}} = \frac{(16\times 36)+70}{16+1} = 38$$

Shortcut Technique

Step 1: Take the difference between the new score and the old average = 70 – 36 = 34

Step 2: This is 34 extra runs which is spread over 17 innings. So, the innings average will increase by 34/17 = 2

Step 3: Hence, the average increases by 36 + 2 = 38.

Here are a few more average questions and their solutions using the same technique.

SOLVED EXAMPLES

1. Find the average of the first 55 natural numbers.

(*a*) 66 (*b*) 65

(*c*) 28 (*d*) 26

(*e*) None of these

Sol. (*c*) Natural numbers = 1, 2, 3,4 ... 55

Sum of 55 natural terms

= 1 + 2 + 3 + 4 + ... + 55

= (1 + 2 + 3 + 4 ... + 55)

$$= 55\times\frac{55+1}{2}$$

$$\Rightarrow \left(\text{Sum of first } n \text{ natural numbers} = \frac{n(n+1)}{2}\right)$$

= 55 × 28 = 1540

Required average = $\frac{1540}{55} = 28$

2. The average of 13 consecutive numbers is 7. Then find the largest of these numbers?

(*a*) 3 (*b*) 4

(*c*) 8 (*d*) 7

(*e*) None of these

Sol. (*e*) Given, Average of 13 consecutive numbers is 7

So, sum of 13 consecutive numbers = 7 × 13 = 91

Let, the numbers be x, $(x + 1)$, $(x + 2)$, $(x + 3)$, $(x + 4)$, $(x + 5)$, $(x + 6)$, $(x + 7)$, $(x + 8)$, $(x + 9)$, $(x + 10)$, $(x + 11)$, $(x + 12)$

So, $x + (x + 1) + (x + 2) + (x + 3) + (x + 4) + (x + 5) + (x + 6) + (x + 7) + (x + 8) + (x + 9) + (x + 10) + (x + 11) + (x + 12) = 91$

$\Rightarrow 13x + 78 = 91$

$\Rightarrow 13x = 13$

$\Rightarrow x = 1$

Thus, largest number = $x + 12 = 13$

3. The average of 30 results is 20 and the average of other 20 results is 30. What is the average of all the results?

(*a*) 24 (*b*) 48

(*c*) 25 (*d*) 50

(*e*) 54

Sol. (*a*) Required average = $\frac{30\times 20+20\times 30}{30+20} = \frac{600+600}{50}$

$= \frac{1200}{50} = 24$

4. A person covers 9 km with a speed of 3 km/hr, 25km with a speed of 5 km/hr and 30 km with a speed of 10 km/hr. Find out the average speed of a person.

(*a*) $5\frac{9}{11}$ km/hr (*b*) $11\frac{5}{9}$ km/hr

(*c*) $9\frac{5}{11}$ km/hr (*d*) $5\frac{5}{11}$ km/hr

(*e*) None of these

Sol. (*a*) Here, P = 9 km, Q = 25 km, R = 30 km

x = 3 km/hr, y = 5 km/hr and z = 10 km/hr

Required average speed

$$= \frac{P+Q+R}{\frac{P}{x}+\frac{Q}{y}+\frac{R}{z}} = \frac{9+25+30}{\frac{9}{3}+\frac{25}{5}+\frac{30}{10}} = \frac{64}{3+5+3}$$

$= \frac{64}{11} = 5\frac{9}{11}$ km/hr

5. If the average marks scored by 238 girls in a class is 109 and the average marks scored of 136 boys of the same class is 142, then find the average marks scored by the whole class?

(*a*) 118 (*b*) 124

(*c*) 116 (*d*) 121

(*e*) None of these

Sol. (*d*) Total marks of the class

= 238 × 109 + 136 × 142 = 25942 + 19312

= 45254

Required average = $\frac{45254}{238+136} = \frac{45254}{374} = 121$

EXERCISE

1. Find the average of the first 50 positive even integers.
(*a*) 49 (*b*) 50 (*c*) 51 (*d*) 25
(*e*) None of these

2. What is the average of all numbers between 100 and 300 which are divisible by 11?
(*a*) 200.5 (*b*) 203.5 (*c*) 201.5 (*d*) 202.5
(*e*) None of these

3. The average of 35 numbers is 60. The average of the first 18 numbers is 67 and average of the last 18 numbers is 55. Find the 18th number?
(*a*) 86 (*b*) 96 (*c*) 90 (*d*) 78
(*e*) 84

4. The average weight of $(x + 2)$ persons is increased by 4.5 kg when one of them who weighs $(2x + 6)$ kg is replaced by a new man. If the weight of the new man is 80 kg, then find the value of x.
(*a*) 10 (*b*) 12 (*c*) 11 (*d*) 9
(*e*) None of these

5. A lift has a weight limit of 800 kg. The heaviest and lightest weight of the people inside the lift are 105 kg and 58 kg respectively. Find the maximum possible number of people in the lift.
(*a*) 12 (*b*) 13 (*c*) 15 (*d*) 18
(*e*) None of these

6. The average income of 65 workers is ₹5680, out of which the average income of 31 workers is ₹2356 and that of 23 workers is ₹4589. What is the average income of the remaining workers? (value in approximate)
(*a*) ₹19832 (*b*) ₹19732
(*c*) ₹17329 (*d*) ₹18329
(*e*) None of these

7. A car travels a certain distance from Moti Nagar to Mohan Nagar at the speed of 40 km/hr and while coming back from Mohan Nagar to Moti Nagar the speed of the car is 80 km/hr. What is the average speed of the car?
(*a*) 53.33 km/hr (*b*) 57.33 km/hr
(*c*) 55.33 km/hr (*d*) 59.33 km/hr
(*e*) 61.33 km/hr

8. The average weight of $(m + 4)$ persons is increased by 5 kg when one of them who weighs $(2m + 3)$ kg is replaced by a new person. If the weight of a new person is 65 kg, then find the total number of persons ?
(*a*) 10 (*b*) 6 (*c*) 14 (*d*) 8
(*e*) 12

9. What is the weight of B if the average weight of A, B, and C is 55 kg, the average weight of A and B is 45 kg, and the average weight of B and C is 50 kg?
(*a*) 25 kg (*b*) 35 kg (*c*) 40 kg (*d*) 55 kg
(*e*) None of these

10. In a class, the recorded marks for a student were mistakenly entered as 80 instead of 70. As a result of this error, the overall average marks for the class increased by 1. How many students are enrolled in the class?
(*a*) 20 (*b*) 14 (*c*) 10 (*d*) 19
(*e*) None of these

11. If the average of a set of 45 numbers is initially calculated as 170, but it is discovered that one of the numbers (65) was recorded incorrectly as 95, what is the revised average (approx.) of the set?
(*a*) 169.66 (*b*) 170.33 (*c*) 169.33 (*d*) 170.66
(*e*) None of these

12. Average weight of the males in a group is 78 kg and the females are 65 kg. The ratio of the number of females to the total number of persons in the group is 6:13. Find the average weight of the group?
(*a*) 76 (*b*) 65 (*c*) 72 (*d*) 78
(*e*) 70

13. In a class, the number of boys is 10 more than that of girls. The average weight of a boy and a girl is 48 kg and 32 kg, respectively and the average weight of each student in the class is 41 kg. Find the total number of students (boys + girls) in the class.
(*a*) 60 (*b*) 80 (*c*) 40 (*d*) 90
(*e*) None of these

14. The average age of P, Q and R is 28 years. If S is included in the group, then the average age becomes 26 years. If the average age of P, Q and S is 27 years, then what is the age of R?
(*a*) 22 (*b*) 23 (*c*) 24 (*d*) 25
(*e*) None of these

15. The average weight of a group of students is 45 kg. If the average weight of 35 students in the group is 42 kg, and the average weight of the remaining students is 50 kg, how many students are there in the group?
(*a*) 55 (*b*) 57 (*c*) 56 (*d*) 59
(*e*) 50

16. The average height of a group of 25 buildings is 70 feet. If two more buildings whose heights are 'y' feet and '$y + 5$' feet are included in the group, the average height becomes 83 feet. What is the height of the second new building ?
(*a*) 248 (*b*) 242 (*c*) 214 (*d*) 240
(*e*) 265

17. The average marks obtained by 150 candidates in an examination is 30. The average marks obtained by passed candidates are 42 while average marks obtained by failed candidates are 20. Find the number of candidates who passed the exam?
(*a*) 80 (*b*) 50 (*c*) 70 (*d*) 65
(*e*) 60

18. A bowler has a bowling average of 32.35. He takes 5 wickets for 20 runs and his bowling average decreased by 0.35. Find the number of wickets taken by him before the last match.
(*a*) 405 (*b*) 395 (*c*) 400 (*d*) 350
(*e*) 500

19. In a family with two grandparents, four parents, and six grandchildren, the average age of the grandparents is 60 years, the average age of the parents is 30 years, and the average age of the grandchildren is 5 years. What is the average age of the entire family?
(*a*) $37\frac{5}{7}$ years (*b*) $39\frac{6}{7}$ years
(*c*) $38\frac{4}{7}$ years (*d*) $35\frac{3}{7}$ years
(*e*) None of these

20. If the average temperature of a town was 90 degrees for the first four days of a month and the average temperature for the first, second, third, and fifth days was 96 degrees, and the temperatures of the fourth and fifth days were in the ratio 13 : 17, what is the temperature on the fifth day?
(*a*) 102 degree (*b*) 94 degree
(*c*) 92 degree (*d*) 96 degree
(*e*) None of these

39. Raghav, a math student, finds the average of twenty 2-digit numbers. While copying numbers, by mistake, he writes one number with its digits interchanged. As a result, his answer is 7.2 less than the correct answer. Find the difference of the digits of the number, in which he made a mistake.

(*a*) 16 (*b*) 18 (*c*) 14 (*d*) 10

(*e*) None of these

40. The average weight of five friends P, Q, R, S, and T is $(x + 6)$ kg while the average weight of R and T is $(x - 6)$ kg. If the weight of another person U is also added, then the average weight of all of them is reduced by 5 kg. Find the value of 'x' if the average weight of P, Q, S and U is 94.5 kg.

(*a*) 74 (*b*) 80 (*c*) 84 (*d*) 90

(*e*) 94

41. A, B, C, D and E are five people. The weight of A, B and C is 90%, 112% and 94% respectively of the average weight of all five. The ratio of weight of D and E is 6 : 11. The difference between the weight of D and E is 75 kg. What is the average weight of all the five persons?

(*a*) 84 kg (*b*) 127 kg (*c*) 90 kg (*d*) 125 kg

(*e*) 92 kg

42. Average marks of a group of students is 48. Out of these, 3 students with marks 43, 68 and 51 are removed and a new student with a score of 84 is added to the list. If the number of students in the group was 8, then find the percentage increase in the average marks with respect to the initial average?

(*a*) 6.25% (*b*) 5.75% (*c*) 8.25% (*d*) 6.75%

(*e*) None of these

43. The average marks in Quantitative Aptitude scored by the aspirants in RRB PO PRELIMS 2022 were 25.5. If four of these aspirants, who actually scored 18, 12, 13.5, and 12.5 marks in the exam had been excluded, then the average marks for the whole aspirants would have been 27.5, Find the number of aspirants appearing in the exam?

(*a*) 26 (*b*) 29 (*c*) 27 (*d*) 25

(*e*) None of these

44. The average of eleven numbers is $(x - 2)$. The average of the first four numbers is $(x + 8)$ and that of the next four numbers is $(x - 7)$. The 9th number is three times the 11th number and the 10th number is 6 less than the 11th number. If the average of the 9th and 11th numbers is 52, then find the value of $(2601 - x^2)$.

(*a*) 103 (*b*) 105 (*c*) 101 (*d*) 107

(*e*) None of these

45. The average number of boys in classes 'A' and 'B' together is 46 and class 'A' has 8 less boys than class 'B'. The average weight of a boy in class 'A' is 45 kg and the total weight of all boys in class 'B' is 410 kg more than the total weight of all boys in class 'A'. Find the average weight of a boy in class 'B'.

(*a*) 40 kg (*b*) 48 kg (*c*) 46 kg (*d*) 44 kg

(*e*) None of these

46. In Ashes Test cricket series, Wasim scored an average of 120 runs per match in the first 3 matches and an average of 140 runs per match in the last four matches. What is Wasim's average runs for the first match and the last two matches if his average runs per match for all the five matches is 122 and total number of matches are 5?

(*a*) 120 (*b*) 200 (*c*) 150 (*d*) 100

(*e*) 175

47. Average weight of 15 monkeys sitting on a tree is 35 kg. Average weight of the first 6 monkeys is 28 kg and the average of the last 6 monkeys is 40 kg. Weight of the 7th monkey is 2.32 kg more than the 8th monkey and 1.15 kg less than the weight of the 9th monkey. Find the average weight of the 7th and 9th monkey?

(*a*) 38.995 kg (*b*) 39.965 kg

(*c*) 36.965 kg (*d*) 39.665 kg

(*e*) 37.665 kg

48. Johnny went to the Post Office from his house at the speed of 60 kmph while returning from Post Office to his house he covered the half of the distance at the speed of 10 kmph, but suddenly he realized that he was getting late so he increased the speed and reached the house by covering rest half of the distance at the speed of 30 kmph. The average speed of the Johnny in the whole length of journey is?

(*a*) 34 kmph (*b*) 14 kmph

(*c*) 16 kmph (*d*) 24 kmph

(*e*) 28 kmph

49. The average salary of the entire workforce in a company is ₹500. If the average salary of 25 managers is ₹550 and the average salary of the remaining workers is ₹470, how many workers are there in the company? (close to nearest integer)

(*a*) 67 (*b*) 57 (*c*) 47 (*d*) 37

(*e*) 77

50. MP's from 5 different parties A, B, C, D and E are present in the Parliament. The average number of MP's from parties A and C is 100 and that from parties B and E is 90. The number of MP's from party B is 50 more than that of party C. The total number of MP's from parties A and E is 230. The number of MP's of party D is 20 more than that of party B. Find the total number of MP's from parties A, E and D.

(*a*) 270 (*b*) 540 (*c*) 280 (*d*) 400

(*e*) 350

51. A trader bought some oranges from different places and at different prices. Average price of all oranges is 50 ₹piece. During his journey from market to village 100 oranges were rotten. Due to this he decided to fi*x* the price of oranges to 60 rupees/piece instead of 90 rupees/piece. Due to this the average price of oranges becomes 45 ₹piece. How many dozen oranges he buys from the market.

(*a*) 50 (*b*) 60 (*c*) 30 (*d*) 40

(*e*) None of these

Answer keys
(Scan QR code for Detailed Explanation)

1. (*c*)	**2.** (*b*)	**3.** (*b*)	**4.** (*a*)	**5.** (*b*)	**6.** (*c*)	**7.** (*a*)	**8.** (*a*)	**9.** (*a*)	**10.** (*c*)
11. (*c*)	**12.** (*c*)	**13.** (*b*)	**14.** (*b*)	**15.** (*c*)	**16.** (*a*)	**17.** (*e*)	**18.** (*c*)	**19.** (*e*)	**20.** (*a*)
21. (*a*)	**22.** (*e*)	**23.** (*a*)	**24.** (*e*)	**25.** (*c*)	**26.** (*d*)	**27.** (*a*)	**28.** (*c*)	**29.** (*a*)	**30.** (*a*)
31. (*e*)	**32.** (*b*)	**33.** (*a*)	**34.** (*b*)	**35.** (*c*)	**36.** (*b*)	**37.** (*a*)	**38.** (*d*)	**39.** (*a*)	**40.** (*d*)
41. (*d*)	**42.** (*a*)	**43.** (*c*)	**44.** (*c*)	**45.** (*c*)	**46.** (*d*)	**47.** (*b*)	**48.** (*d*)	**49.** (*a*)	**50.** (*e*)
51. (*a*)									

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I, Mayank Shukla, an experienced educator, author, and mentor in Quantitative Aptitude, have studied all major competitive exams such as IBPS, SBI, RBI, and SSC. Over the years, I have guided lakhs of students, many of whom successfully cleared their banking exams. This book reflects my years of experience and is designed in a clear, structured format to help you prepare faster and move closer to your goal. I hope it becomes a valuable companion in your preparation journey. Enjoy learning!

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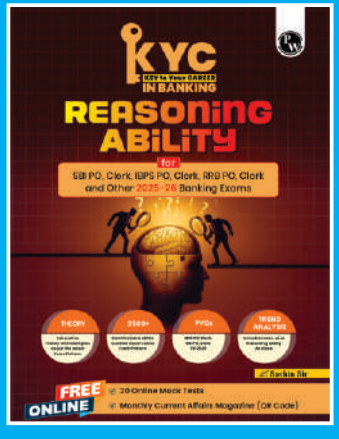

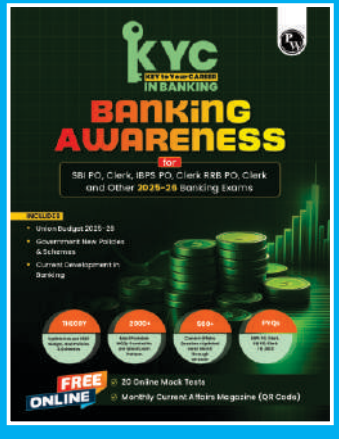

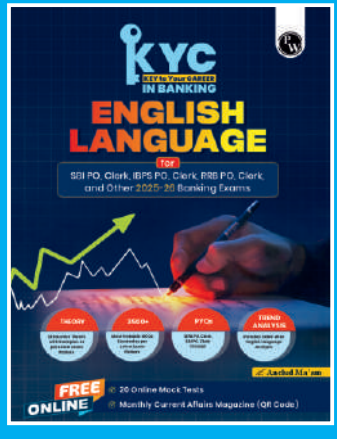

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