

MIXTURES AND ALLEGATIONS

1. In what ratio must a shopkeeper mix two types of rice worth Rs. 50 kg and Rs. 70 kg, so that the average cost of the mixture is Rs. 65 kg? **1:3**

2. A container contains 50 litres of milk. From this container, 10 litres of milk was taken out and replaced by water. This process is repeated one more time. How much milk is now left in the container? **32 L**

3. In what ratio must two kinds of sugar at Rs. 1.15 and Rs. 1.24 per kg be mixed so that by selling at Rs. 1.50 per kg, 25% may be gained? **1.2**

4. How much water be mixed in 36 litre of milk worth Rs. 5.00 per litre, so that value of mixture is Rs. 3.60 per litre? **14**

5. How many kg of Sugar at 50 P per kg must a man mix with 25 kg of sugar at 34P per kg so that by selling the mixture at 44P per kg he gains 10% on the outlay?

6. How much sugar at Rs. 9.5 a kg should be added to 17 kg of tea at Rs. 20 a kg so that the mixture be worth Rs. 13 a kg.?

7. A hospital uses a mixture of salt and water at Rs. 7.62/litre. This mixture contains 5 % salt. Another mixture containing 75 % water costs Rs. 7.82/litre. How much does the patient pay if he buys 5 litres of mixture containing 18% salt?

8. A vessel is full of mixture of spirit and water in which there is 20 per cent of spirit. 5 litres are drawn off and the vessel is filled up with water. If the spirit is now 12 %, find the total quantity in the vessel (in ltrs).

9. An alloy of copper and nickel contains 65 % copper. A second alloy contains copper and nickel in the ratio 17 : 3. In what ratio should the two alloys be mixed so that the new mixture contains 4 times as much copper as nickel?

10. A Mixture contain 88% of sulphur, another mixture contain 70% of sulphur. In order to get 84% of sulphur, in what ratio these two must be mixed.

11. In what ratio water be mixed with juice costing Rs. 12 per liter to obtain a mixture worth of Rs. 8 per litre?

12. In what proportion must water be mixed with milk to gain 40 % by selling it at cost price ?

13. 400 gm spirit solution has 30 % spirit in it , what is the ratio of spirit should be added to make it 80 %.in the solution ?

14. One alloy contains silver and copper in the ratio 5:1 and the other contains in the ratio 7:2 respectively. What weights of the 2 must be melted together, so as to make a 5 lb mass with 80% silver?

15. Box A contains wheat worth Rs.30 per kg and box B contains wheat worth Rs.40 per kg. If both A and B are mixed in the the ratio 4:7 then the price of mixture per kg is

PARTNERSHIP



LOGARITHM

1. Express $5^3 = 125$ in logarithm form
2. Express $\log_{10} 1 = 0$ in exponential form.
3. Find the log of 32 to the base 4.
4. If $\log_a m = n$, express a^{n-1} in terms of a and m.
5. Find x if $\log_5(x-7) = 1$.
6. Solve for x if $\log(x-1) + \log(x+1) = \log_2 1$
7. Express $\log(75/16) - 2\log(5/9) + \log(32/243)$ in terms of log 2 and log 3.
8. $2\log(15/18) - \log(25/162) + \log(4/9) = \log x$; find x
9. Find the value of x, if $\log(x+5) + \log(x-5) = 4\log 2 + 2\log 3$
10. Solve for x, if $(\log 225/\log 15) = \log x$

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PROBLEMS

1. A man buys a cycle for Rs. 1400 and sells it at a loss of 15%. What is the selling price of the cycle?

- a. Rs. 1090 b. Rs. 1160 c. Rs. 1190 d. Rs. 1202

2. A man bought a horse and a carriage for Rs. 3000. He sold the horse at a gain of 20% and the carriage at a loss of 10%, thereby gaining 2% on the whole. Find the cost of the horse.

- a. 2200 b. 1800 c. 1000 d. 1200 e. None

3. When a plot is sold for Rs. 18,700, the owner loses 15%. At what price must that plot be sold in order to gain 15%?

- a. Rs.21,000 b. Rs.22,500 c. Rs.25,300 d. Rs.25,800

4. A shopkeeper sells one transistor for Rs. 840 at a gain of 20% and another for Rs. 960 at a loss of 4%. His total gain or loss percent is:

- a. 5.88 % loss b. 5.88 % gain c. 6.25 % gain d. None

5. Even after reducing the marked price of a transistor by Rs 32, a shopkeeper makes a profit of 15%. If the cost price be Rs 320, what percentage of profit would he have made if he had sold the transistor at the marked price?

- a. 15% b. 10% c. 20% d. 25% e. None of these

6. A trader has 50 kg of rice, a part of which he sells at 14% profit and rest at 6% loss. On the whole his loss is 4%. What is the quantity sold at 14% profit and that at 6% loss?

- a. 5 and 45 kg b. 10 and 40 kg c. 15 and 35 kg
d. 20 and 30 kg e. None

7. A milkman purchases the milk at Rs. x per litre and sells it at Rs. 2x per litre still he mixes 2 litres water with every 6 litres of pure milk. What is the profit percentage?

- a. 116% b. 166.66% c. 60% d. 100% e. None

8. If the cost price is 25% of selling price. Then what is the profit percent.

- a. 150% b. 200% c. 300% d. 350% e. None

9. With the money I have , I can buy 50 pens or 150 pencils. I kept 10% aside for taxi fare. With the remaining , I purchased 54 pencils and P pens. What is the value of P?

- a. 32 b. 30 c. 27 d. None of these

10. If the cost price of 12 pens is equal to the selling price of 8 pens, the gain percent is ?

- a. 12% b. 30% c. 50% d. 60% e. None

11. The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

- a.16 b.19 c.12 d.22 e. None

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12. The price of a jewel, passing through three hands, rises on the whole by 65%. If the first and second sellers earned 20% and 25% profit respectively, find the percentage profit earned by the third seller.

- a. 10% b. 22% c. 18% d. 12% e. None

13. A shopkeeper purchased 150 identical pieces of calculators at the rate of Rs 250 each. He spent an amount of Rs. 2500 on transport and packaging. He fixed the labeled price of each calculator at Rs 320. However, he decided to give a discount of 5% on the labeled price. What is the percentage profit earned by him?

- a. 14% b. 15% c. 16% d. 25% e. None

14. A man buys oranges at Rs 5 a dozen and an equal number at Rs 4 a dozen. He sells them at Rs 5.50 a dozen and makes a profit of Rs 50. How many oranges does he buy?

- a. 30 dozens b. 40 dozens c. 50 dozens d. 60 dozens

15. A Shopkeeper sells two articles at Rs.1000 each, making a profit of 20% on the first article and a loss of 20% on the second article. Find the net Profit or loss that he makes?

- a. 4% b. 5% c. 6% d. 8% e. None

16. Anil bought a T.V with 20% discount on the labeled price . Had he bought it with 25% discount, he would have saved Rs. 500. At what price did he buy the T.V?

- a. 16000 b. 12000 c. 10000 d. Rs. 5000

17. A shopkeeper sells one-third of his goods at a profit of 10%, another one-third at a profit of 20%, and the rest at a loss of 6%.What is his overall profit percentage ?

- a. 6% b. 8% c. 10% d. 12% e. None

18. Nani purchased 20 dozens of apples at the rate of Rs. 375 per dozen. He sold each one of them at the rate of Rs. 33. What was his percentage profit?

- a. 3.5 b. 4.5 c. 5.6d. 6.5 e. None

19. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?

- a.125% b.150% c.70% d. 95% e. None

20. At what percentage above the C.P must an article be marked so as to gain 52% after allowing a customer a discount of 5%?

- a. 50%b. 45% c. 40% d. 60% e. None

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NOTE: When you have the word "only" in your question. Please ensure the sex of the people involved in your relationship. If the statement "The only daughter of the father" is spoken by a female then the answer is "yourself" else you are a man and the answer is "sister".

PROBLEMS

1) Introducing Priyanka, Shalini says that her mother is the only daughter of my mother. How is Shalini related to Priyanka ?

- (A) Mother (B) Sister (C) Daughter
(D) Aunt (E) None of these

2) Pointing to a photograph, Rajesh said, "she is the mother of my mother's mother's daughter". How is Rakesh related to the woman in the photograph?

- (A) Son (B) Nephew (C) Maternal grand son
(D) Brother (E) None of these

3) Pointing to a lady in the photograph Kiran said, "She is the daughter of the daughter of the only son of my grand father." How is the lady related to Kiran ?

- (A) Sister (B) Maternal aunt
(C) Niece (D) Cousin (E) None of these

4) Pointing to Manju, Deepak said, "She is the wife of the only son of my father's father." How is Manju related to Deepak?

- (A) Mother (B) Sister (C) Aunt
(D) Sister-in-law (E) None of these

5) A lady pointing to a man in photograph says, "The father of his brother is the only son of my maternal grand father." How is the man related to that lady?

- (A) Husband (B) Son
(C) Father (D) Maternal uncle
(E) None of these

6) A lady pointing to a man in a photograph says, "The sister of the son of this man is my mother-in-law." How is the husband of the lady related to the man in the photograph?

- (A) Maternal grand son (B) Nephew (C) Son
(D) Maternal grand father (E) None of these

7) Radhika says, "Rajeev's grand father is the only son of my father." How is Radhika related to Rajeev ?

- (A) Daughter (B) Sister (C) Niece (D) Grand mother
(E) None of these

8) Introducing a man, a woman says, "He is the only son of my mother's mother." How is the man related to the woman?

- (A) Uncle (B) Father (C) Maternal uncle
(D) Uncle (E) None of these

9) Pointing a woman, Mohit says, "The only son of her mother is my father." How is Mohit related to the woman ?

- (A) Nephew (B) Brother (C) Son (D) Grandson (E) None

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10) Pointing to Kamala, Arjun says, "She is the only daughter of my father-in-law." How is Kamala related to Arjun ?

- (A) Daughter (B) Niece (C) Wife
- (D) Daughter-in-law (E) None of these

11) Pointing to a man Sneha says, "He is the only son of my father's father." How is Sneha related to the man ?

- (A) Mother (B) Grand daughter (C) Niece
- (D) Sister (E) None of these

12) Pointing to a lady in photograph, Madhuraj said, "Her mother is the only daughter of my mother's mother." How is Madhuraj related to the lady?

- (A) Nephew (B) Uncle (C) Maternal uncle (D) Brother
- (E) None of these

13) If $P \times Q$ means— P is the brother of Q', $P \div Q$ means P is the son of Q' and $P - Q$ means P is the sister of Q', then which of the following relations will show that Q is the maternal uncle of P ?

- (A) $Q \times R \div P$ (B) $Q \div R - P$ (C) $P \times R - Q$
- (D) $P + R - Q$ (E) None of these

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14) A lady pointing to a woman in a photograph says, "She is the only daughter of my father-in-law." How is the woman related to the lady?

- (A) Mother (B) Sister (C) Friend
- (D) Aunt (E) None of these

15) A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to C?

- (a) Father (b) Brother
- (c) Grand father (d) Uncle (e)None

16) Smitha introduced a boy as the son of the daughter of the father of her uncle. The boy is Smitha's

- (a) Brother (b) Son (c) Uncle
- (d) Son-in-law (e)None

17) Pointing to a man, a woman said: "His mother is the only daughter of my mother." How is the woman related to the man?

- (a) Mother (b) Daughter (c) Sister
- (d) Grand mother (e)None

18) Ram has a brother Shyam. Ram is the son of Ramesh. Suresh is Ramesh's father. How Shyam is related to Suresh?

- (a) Son (b) Grandson (c) Brother
- (d) Grand father (e)None

19) C is A's father's nephew. D is A's cousin but not the brother of C. How is D related to C?

- (a) Father (b) Sister (c) Mother (d) Aunt (e)None

20) A is the father of C and D is the son of B. E is the brother of A. If C is the sister of D, how is B related to E?

- (a) Daughter (b) Brother-in-law
- (c) Husband (d) Sister-in-law (e)None

21) Q's mother is the sister of P and daughter of M. S is the daughter of P and sister of T. How is M related to T?

- (a) Grand mother (b) Father
- (c) Grand Father (d) None of these

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Directions (22-24) :

- (i) A is the son of B.
- (ii) C, who is the sister of B has a son D and a daughter E.
- (iii) F is the maternal uncle of D.

22) How is A related to D?

- (a) Cousin (b) Nephew
- (c) Uncle (d) Brother (e) None

23) How is E related to F?

- (a) Sister (b) Daughter
- (c) Niece (d) Wife (e) None

24) How many nephews does F have?

- (a) None (b) One (c) Two
- (d) Three (e) cnbd

Directions: Read the following information and answer the question given below it .

A is the father of a C .But C is not his son .

E is the daughter of C .F is the spouse of A.

B is the brother of C. D is the son of B.

G is the spouse of B. H is the father of G.

25) Who is the grandmother of D?

- a) A b) C c) F d) H e) None

26) Who is the son of F?

- a) B b) C c) D d) E e) None

Directions: Read the following information and answer the question given below it.

- i) In a family of six persons A, B, C, D, E, and F, There are two married couples.
- ii) D is grandmother of A and E.
- iii) C is wife of B and mother of E.
- iv) F is the granddaughter of E.

27) What is C to A?

- a) Daughter b) grandmother c) mother
- d) cannot be determined e) none of these

28) How many male members are there in the family?

- a) two b) three c) four d) cannot be determined
- e) none of these

29) Which of the following is true?

- a) A is brother of F. b) A is the sister of F.
- c) D has two grandsons .
- d) B has two daughters e) None of these.

30) Who among the following is one of the couples?

- a) CD b) DE c) EB
- d) Cannot be determined e) None of these

Directions(31-35):

A \$ B means A is mother of B

A # B means A is father of B

A @ B means A is husband of B

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A%B means **A** is **daughter** of **B**

31) P @ Q \$ M # T indicates what relation of P with T?

- (a) Paternal grandmother
- (b) Maternal grandmother
- (c) Paternal grandfather
- (d) Maternal grandfather
- (e) None of these

32) Which of the following expressions indicates R is the sister of H?

- (a) H \$ D @ F # R
- (b) R % D @ F \$ H
- (c) R \$ D @ F
- (d) H % D @ F \$ R
- (e) None of these

33) If F @ D % K # H, then how F related to H

- (a) Brother-in-law
- (b) Sister
- (c) Sister-in-law
- (d) Cannot be determined
- (e) None of these

34) Which of the following expressions indicates H is the brother of N

- (a) H # R \$ D \$ N
- (b) N % F @ D \$ H # R
- (c) N % F @ D \$ H
- (d) N % F @ D % H
- (e) None of these

35) If G \$ M @ K, how is K related to G

- (a) Daughter-in-law
- (b) Mother-in-law
- (c) Daughter
- (d) Aunt
- (e) None of these

Directions (36-40):

P = Q means Q is the father of P

P * Q means P is the sister of Q

P ? Q means Q is the mother P

P \$ Q means P is the brother of Q

P @ Q means Q is son of P

P # Q means P is the daughter of Q

36) Which of the following is not correct?

- (a) R # S ? T means R is granddaughter of T
- (b) P = Q ? R means R is grandmother of p
- (c) L \$ M * O means O is sister of L
- (d) M * O @ P = Q means Q and O are husband and wife
- (e) All are correct

37) Which of the following is correct?

- (a) V # T * P means P is maternal uncle of V
- (b) D ? V # T means D is granddaughter of T
- (c) L @ M \$ R means R is paternal uncle of L
- (d) M @ R * D ? V means M is son of V
- (e) None is correct

38) Which of the following indicates A is grandfather of B?

- (a) M # A = N = B
- (b) B \$ L # Q # A
- (c) B # L # A
- (d) L * B = S \$ Q = A
- (e) None of these

39) Which of the following means F is paternal uncle of G?

- (a) G # L \$ F \$ N
- (b) N \$ F \$ L # G
- (c) G # M * F \$ L
- (d) L = F \$ Q @ G
- (e) None of these

40) S # M * B @ L = F ? Q reveals which of the following relations?

- (a) F and B are brother and sister
- (b) B is paternal uncle of S
- (c) L is grandmother of Q
- (d) M is maternal aunt of L
- (e) None of the above relations gets

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TIME SPEED AND DISTANCE

1. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

- A) 3.6
- B) 7.2
- C) 8.4
- D) 10

2. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in $1\frac{2}{3}$ hours, it must travel at a speed of:

- A) 300 kmph
- B) 360 kmph
- C) 600 kmph
- D) 720 kmph

3. A cyclist covers a distance of 800 meter in 4 minutes 20 seconds. What is the speed in km/hr of the cyclist?
A) 6.2 km/h B) 8.4 km/hr C) 11.05 km/hr D) 16.07 km/hr

4. A man walking at the rate of 6 km/hr crosses a bridge in 15 minutes. The length of the bridge is _____.
A) 1000 m B) 1250 m C) 1500 m D) 1800 m

6. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:

- A) 50km
- B) 56km
- C) 70km
- D) 80km

7. Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?

- A) 9
- B) 10
- C) 12
- D) 20

8. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. The duration of the flight is:

- A) 1 hour
- B) 2 hours
- C) 3 hours
- D) 4 hours

9. In what time will a railway train 60 m long moving at the rate of 36 kmph pass a telegraph post on its way?

- A) 9 sec
- B) 8 sec
- C) 7 sec
- D) 6 sec

10. Two trains each 250 m in length are running on the same parallel lines in opposite directions with the speed of 80 kmph and 70 kmph respectively. In what time will they cross each other completely?

- A) 10 sec
- B) 11 sec
- C) 12 sec
- D) 14 sec

11. A man completes a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

- A) 220km
- B) 224km
- C) 230km
- D) 234km

12. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

- A) 70kmph
- B) 75kmph
- C) 84kmph
- D) 87.5kmph

13. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, then the speed of the first train is:

- A) 5kmph
- B) 6kmph
- C) 6.25kmph
- D) 7.5kmph

14. A farmer travelled a distance of 61 km in 9 hours. He travelled partly on foot @ 4 km/hr and partly on bicycle @ 9 km/hr. The distance travelled on foot is:

- A) 14km
- B) 15km
- C) 16km
- D) 17km



15. A car travelling with _____ of its actual speed covers 42 km in 1 hr 40 min 48 sec. Find the actual speed of the car.

- A) 17 6/7 kmph B) 25 kmph C) 30 kmph D) 35 kmph

16. A man covered a certain distance at some speed. Had he moved 3 kmph faster, he would have taken 40 minutes less. If he had moved 2 kmph slower, he would have taken 40 minutes more. The distance (in km) is:

- A) 35 B) 36 2/3 C) 37 1/2 D) 40

17. How many seconds will a train 100 meters long take to cross a bridge 150 meters long if the speed of the train is 36 kmph?

- A) 18 B) 22 C) 25 D) 28

18. A train 100 meters long completely crosses a 300 meters long bridge in 45 seconds. What is the speed of the train is?

- A) 32 kmph B) 36 kmph C) 40 kmph D) 48 kmph

19. Two trains travelling in the same direction at 40 and 22 kmph completely pass off another in 1 minute. If the length of the first train is 125 m, what is the length of the second train?

- A) 125 m B) 150 m C) 175 m D) 185 m

20. A train leaves Delhi at 9 a.m. at a speed of 30 kmph. Another train leaves at 2 p.m. at a speed of 40 kmph on the same day and in the same direction. How far from Delhi, will the two trains meet?

- A) 300 km B) 400 km C) 600 km D) None

21. A train of 24 carriages, each of 60 meters length, when an engine also of 60 meters length is running at a speed of 60 kmph. In what time will the train cross a bridge 1.5 km long?

- A) 1 1/2 mins B) 3 mins C) 3 1/2 mins D) 7 mins

22. Two trains are moving at 50 kmph and 70 kmph in opposite directions. Their lengths are 150 m and 100 m respectively. The time they will take to pass each other completely is?

- A) 3 sec B) 4 1/2 sec C) 5 sec D) 7 1/2 sec

23. Two trains are moving in the same direction at 72 kmph and 36 kmph. The faster train crosses a man in the slower train in 27 seconds. Find the length of the faster train?

- A) 270 m B) 250 m C) 280 m D) 220 m

24. A train 125 m long passes a man, running at 5 km/hr in the same direction in which the train is going, in 10 seconds. The speed of the train is:

- A) 45 kmph B) 50 kmph C) 54 kmph D) 55 kmph

25. A train 125 m long passes a man, running at 5 km/hr in the same direction in which the train is going, in 10 seconds. The speed of the train is:

- A) 2 hours B) 3 hours C) 4 hours D) 5 hours

26. A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

- A) 8.5 kmph B) 9 kmph C) 10 kmph D) 12.5 kmph

27. A motorboat, whose speed is 15 km/hr in still water goes 30 km downstream and comes back in a total of 4 hours 30 minutes. The speed of the stream (in km/hr) is:

- A) 4 B) 5 C) 6 D) 10

28. In one hour, a boat goes 11 km/hr along the stream and 5 km/hr against the stream. The speed of the boat in still water (in km/hr) is:

- A) 3 kmph B) 5 kmph C) 8 kmph D) 9 kmph

29. A plane flies along the four sides of a square field at a speed of 200, 400, 600 and 800 km/hr. Then find the average speed of plane around the square field.

- A. 394

- B. 400

- C. 414

- D. 384

30. Laxman has to cover a distance of 6 km in 45 minutes. If he cover one half of the distance in 2/3rd time, what should be his speed to cover the remaining distance in the remaining time?

- A. 12 km/hr.

- B. 16 km/hr.

- C. 3 km/hr.

- D. 8 km/hr.

