DI Test 3 & 5

SET 1: Answer the questions based on the information given below. There are 3 families 'A', 'B' and 'C'. Each family consists of only 4 members namely, father, mother, son and daughter. The table given below gives the information regarding the ages of each of the 4 members in these 3 families. Some of the data in the table are missing. You have to find the missing data and answer the questions that follow.

Note:- Any ratio written as 'Ratio of ages of father/mother/son and mother/son/daughter, in family 'A' and 'B', respectively' means '(Age of father/mother/son in family 'A'):(Age of mother/son/daughter in family 'B')'

	Ratio of present ages of father and mother, respectively	Ratio of present ages of the mother and son, respectively	3 years hence from now, ratio of ages of the son and the daughter, respectively	Difference between the ages of the son and the daughter
In family 'A' only	9:7	__	3:2	__
In family 'A' and 'B', respectively	3:4	5:3	__	3 years
In family 'C' only	__	5:2	__	__
In family 'B' and 'C', respectively	4:5	15:7	_:3	6 years

Additional information: i) 4 years ago from now, the ratio of ages of the father and the son, in family 'C' was 10:3, respectively. **ii)** 6 years ago from now, the age of the father is family 'C' was twice of that in family 'A'. **iii)** The average present age of the daughters in families 'A' and 'C' together is equal to the present age of the daughter in family 'B'. **iv)** The average age of a person in family 'C' is not more than 52 years. **v)** 3 years ago from now, the age of the daughter in family 'B' was at least 30% of the age of the son in family 'C'.

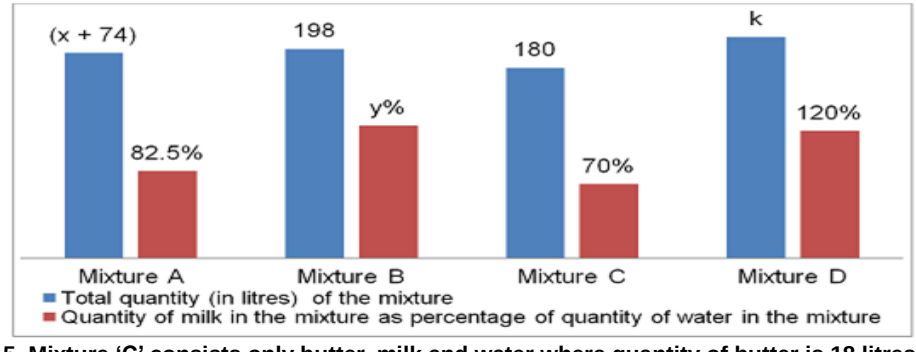
1. When the father in family 'C' is celebrating his 85th birthday, the age of the son in family 'A' will be how much percent more than the age of the daughter in family 'A'?
A.65% B.70% C.60% D.50% E.75%

2. How many years hence from now, will the age of the mother in family 'A' be 20% more than the age of the son in family 'C'? A.7 years B.12 years C.9 years D.5 years E.8 years

3. What is the difference between the present average age of the fathers in families 'B' and 'C' and the present average age of the mothers in families 'B' and 'C'?
A.3 years B.12 years C.8 years D.5 years E.10 years

4. If family 'B' had one more daughter then the present average age of each member in the family would be 32 years. Find the present age of that daughter.
A.15 years B.11 years C.20 years D.8 years E.9 years

SET 2: Answer the questions based on the information given below. The bar graph given below gives the information about total quantity of 4 different mixtures and also the quantity of milk as percentage of the quantity of water in the respective four mixtures. Note: The given 4 mixtures are not necessarily mixtures of only milk and water and may also contain other ingredients as specified by the question



5. Mixture 'C' consists only butter, milk and water where quantity of butter is 18 litres more than quantity of water. If half of mixture 'C' is replaced with 6 litres of water, then what will be the proportion of water in the resultant mixture? A.(2/7) B.(4/9) C.(3/8) D.(5/8) E.(5/9)

6. Mixture 'A' consists only honey, milk and water where ratio of quantities of honey and milk is 8:11, respectively. If quantity of honey and milk are increased by 7.4 litres and 10%, respectively, then sum of quantity of honey and milk would become 60% more than that of water. Find the value of 'x'. A.166 B.120 C.128 D.144 E.136

7. Mixture 'B' consists only of milk and water where quantity of milk is 110 litres. Find the value of 'y'. A.80 B.75 C.110 D.90 E.125

8. Mixture 'D' consist only milk and water. 46 litres of mixture 'E' contains 260% more milk than water in it. If mixtures 'D' and 'E' are completely mixed, then ratio of quantity of water to that of milk in resultant mixture will be 7:10. Find the value of 'k'. A.209 B.198 C.224 D.236 E.189

SET 3: Study the following table and answer the following questions.
Expenditures of a Family per annum over the given years.

Year		Expenditure (In Rupees)			
	Salary	Children's studies	Savings	Loan interest	Food and Shopping
2000	2 Lakh	32000	50000	4000	20000
2001	2.5 Lakh	33000	65500	6000	25000
2002	3 Lakh	36000	70000	7000	28000
2003	3.5 Lakh	40000	75000	8500	30000
2004	4 Lakh	42000	78500	9000	34000

9. What is the average amount of interest per year which the family had to pay during this period?
A) 6500 B) 6900 C) 7250 D) 7300 E) None

10.The amount of food and shopping spend by the family during the year 2004 is approximately what percent of that of the salary during that year? A) 6.5% B) 7% C) 8.5% D) 9% E) None

11.Total expenditure on all the items in 2000 was approximately what percent of the total expenditure in 2002? A) 75 % B) 82% C) 78% D) 69% E) None

12.The difference between the expenditure of the family over these items during the year 2001 and 2003? A) Rs 22000 B) Rs 27500 C) Rs 26000 D) Rs 24000 E) None

13.The ratio between the total expenditure on loan for all the years and the total expenditure on Children's studies for all the years respectively is approximately?
A) 29:125 B) 32:147 C) 23:122 D) 25:133 E) None

SET 4: Study the following information carefully and answer the questions given below.
Two surveys were conducted on the same no. of people about the no. of people who like to travel by sea, hill, or forest and the no. of people who like to travel by bus, train, and plane. The ratio of people who like only forests and only seas is 9:7. The no. of people who like only hills is eight times the no. of people who like all hills, the sea, and the forest. The no. of people who like to travel by bus, train, and plane is two less than the no. of people who like to travel by hill, sea, and forest. The no. of people who like only forests is five more than the no. of people who like only hills. The no. of people who both train and bus but not plane is the same as the no. of people who like both forests and hills but not the sea. The total no. of people who like Hill is 62. The no. of people who like only buses is five less than the no. of people who like only the sea. The no. of people who like only planes is two more than the no. of people who like only hills. The no. of people who like only trains is 10 more than 5 times of the no. of people who like both planes and buses but not trains. The no. of people who like all three modes of transportation (bus, train, and plane) is 3. The no. of people who like both buses and planes but not trains is three more than the no. of people who like all three: forest, sea, and hill. The no. of people who like both trains and planes but not buses is the same as the no. of people who like both forests and seas but not hills. The no. of people who like both sea and hill but not forest is the same as the no. of people who like both bus and plane but not train. The total no. of people like Plane is 60.

14. Find the ratio between the total number of people who like forests and seas to the total number of people who like trains and buses. 1.147:157 2.121:129 3.121:119 4.112:129 5.None of these

15. If 'x' is the percentage of the number of people who like bus and train but not plane to the number of people who like bus and plane but not train. Find the value approximate value 5x+9.65?
1.548 2.546 3.572 4.552 5.None of these

16. If 'm' is equal to the total number of people who like train and Bus together and 'n' is equal to the difference between the number of people who like only plane and only bus. So, find m^2+n^2=?
1.11595 2.11594 3.11593 4.11592 5.11591

17. If 't' is equal to the total number of people who like both sea and hill but not forest and 's' is equal to the total number of people who like train and plane but not bus. Find the value $(t*s)^2$=?
1.3254 2.3684 3.3247 4.3136 5.3524

{1 – 4}
Solution
Let the present age of the father in family 'A' = '9x' years
Then, present age of the mother in family 'A' = 9x X (7/9) = '7x' years
Present age of the mother in family 'B' = 9x X (4/3) = '12x' years
Let the present age of the father in family 'B' = '4y' years
Then, present age of the mother in family 'C' = 4y X (5/4) = '5y' years
Present age of the son in family 'C' = 5y X (2/5) = '2y' years
According to the data,
(12x:2y) = (15:7)
Or, 84x = 30y
So, x:y = 30:84 = 5:14
Present age of the son in family 'B' = 7x X (3/5) = '4.2x' years
4 years ago from now, age of the son in family 'C' = (2y - 4) years
4 years ago from now, age of the father in family 'C' = (2y - 4) X (10/3) = {(20y - 40)/3} years
6 years ago from now, age of the father in family 'C' = {(20y - 40)/3} - 2 = {(20y - 40 - 6)/3} = {(20y - 46)/3} years
6 years ago from now, age of the father in family 'A' = (9x - 6) years
According to the data,
{(20y - 46)/3} = (9x - 6) X 2 = (18x - 12)
Or, 20y - 46 = 54x - 36
Or, 54x - 36 = 20 X (14/5)x - 46
Or, 54x - 36 = 56x - 46
Or, 2x = 10
So, x = 5
So, y = 14
3 years hence from now, let the age of the son in family 'A' = '3z' years
Then, 3 years hence from now, age of the daughter in family 'A' = 3z X (2/3) = '2z' years
So, present ages of the son and daughter in family 'A' are (3z - 3) years and (2z - 3) years, respectively
So, present age of the daughter in family 'B' is either '3z' years or (3z - 6) years
Similarly, present age of the daughter in family 'C' is (21 - 6) or (21 + 6) years
Maximum possible age of all members in family 'C' = 52 X 4 = 208
So, maximum possible age of the daughter in family 'C' = 208 - (84 + 70 + 28) = 26 years
So, present age of the daughter in family 'C' = 21 - 6 = 15 years
So, present age of the daughter in family 'B' = {(2z - 3) + 15} ÷ 2 = (z + 6) years
Case I:
Or, z + 6 = 3z
Or, z = (6/2) = 3
So, present age of the daughter in family 'B' = 9 years
3 years ago from now, age of the son in family 'C' and daughter in family 'B' is 25 years and 6 years, respectively
But (6/25) X 100 = 24% < 30%
So, case I is not true.
Case II:
z + 6 = 3z - 6
So, z = (12/2) = 6
And so, present age of the daughter in family 'B' = 18 - 6 = 12 years
3 years ago from now, age of the son in family 'C' and daughter in family 'B' is 25 years and 9 years, respectively
We have, (9/25) X 100 = 36% > 30%
So, case II is true.

Family	Present age of the father	Present age of the mother	Present age of the son	Present age of the daughter
'A'	45	35	15	9
'B'	56	60	21	12
'C'	84	70	28	15

1.Solution
Number of years to the 85th birthday of the father in family 'C' = 85 - 84 = 1
So, required percentage = (15 + 1 - 9 + 1) ÷ (9 + 1) X 100 = 60%
Hence, option c.
2.Solution
Let the required number of years = 'y' years
So, (35 + y) = (28 + y) X 1.2
Or, 35 + y = 33.6 + 1.2y
Or, 1.4 = 0.2y
Or, y = 1.4 ÷ 0.2 = 7
Hence, option a.
3.Solution
Average of the present age of the fathers in families 'B' and 'C' = (56 + 84) ÷ 2 = 70 years
Average of the present age of the mothers in families 'B' and 'C' = (60 + 70) ÷ 2 = 65 years
So, required difference = 70 - 65 = 5 years
Hence, option d.
4.Solution
Sum of present ages of all 5 members of family 'B' = 32 X 5 = 160 years
So, present age of the other daughter = 160 - (56 + 60 + 21 + 12) = 11 years
Hence, option b.
{5 – 8}
5.Solution
Let the original quantity of water in mixture ‘C’ = ‘10y’ litres
Then, original quantity of milk in mixture ‘C’ = 10y × 0.7 = ‘7y’ litres
Original quantity of butter in mixture ‘C’ = (10y + 18) litres
So, original quantity of entire mixture ‘C’ = 10y + 7y + 10y + 18 = (27y + 18) litres
So, 27y + 18 = 180
Or, y = (180 – 18) ÷ 27 = 6
So, original quantity of water, milk and butter in mixture ‘C’ is 60 litres, 42 litres and 78 litres, respectively.
If half of mixture ‘C’ is replaced with 6 litres of water,
Then quantity of water in resultant mixture = 60 ÷ 2 + 6 = 36 litres
Total quantity of the mixture = 180 ÷ 2 + 6 = 96 litres
So, required proportion = (36/96) = (3/8)
Hence, option c.
6.Solution
Let the quantity of water in mixture ‘A’ = ‘40y’ litres
Then, quantity of milk in mixture ‘A’ = 40y × 0.825 = ‘33y’ litres
Quantity of honey in mixture ‘A’ = 33y × (8/11) = ‘24y’ litres
Increased quantity of honey = (24y + 7.4) litres
Increased quantity of milk = 33y × 1.1 = ‘36.3y’ litres
Sum of quantity of milk and honey = 24y + 36.3y + 7.4 = (60.3y + 7.4) litres
So, 60.3y + 7.4 = 40y × 1.6 = 64y
Or, 3.7y = 7.4
So, y = 7.4 ÷ 3.7 = 2

Therefore, original quantities of water, milk and honey in mixture 'A' is 80 litres, 66 litres and 48 litres, respectively.
So, 80 + 66 + 48 = x + 74
Or, 194 = x + 74
So, x = 194 – 74 = 120
Hence, option b.

7.Solution
Quantity of milk in mixture 'B' = 110 litres
So, quantity of water in mixture 'B' = 198 – 110 = 88 litres
So, y = (110/88) × 100 = 125
Hence, option e.

8.Solution
Let the quantity of water in mixture 'D' = '5y' litres
Then, quantity of milk in mixture 'D' = 5y × 1.2 = '6y' litres
Let the quantity of water in mixture 'E' = 'z' litres
Then, quantity of milk in mixture 'E' = z + z × 2.6 = '3.6z' litres
According to the question,
z + 3.6z = 46
Or, 4.6z = 46
Or, z = 46 ÷ 4.6 = 10
So, quantity of water and milk in mixture 'E' is 10 litres and 36 litres, respectively.
We have, {(5y + 10)/(6y + 36)} = (7/10)
Or, 50y + 100 = 42y + 252
Or, 8y = 152
So, y = (152/8) = 19
So, total quantity of mixture 'D' = k = 5y + 6y = 11y = 11 × 19 = 209 litres
Hence, option a.

{9 – 13}

9.Option B
Solution:
Average =(4000+6000+7000+8500+9000)/5
=34500/5=6900.

10.Option C
Solution:
4,00,000 == 100
34000 ?==> 8.5%.

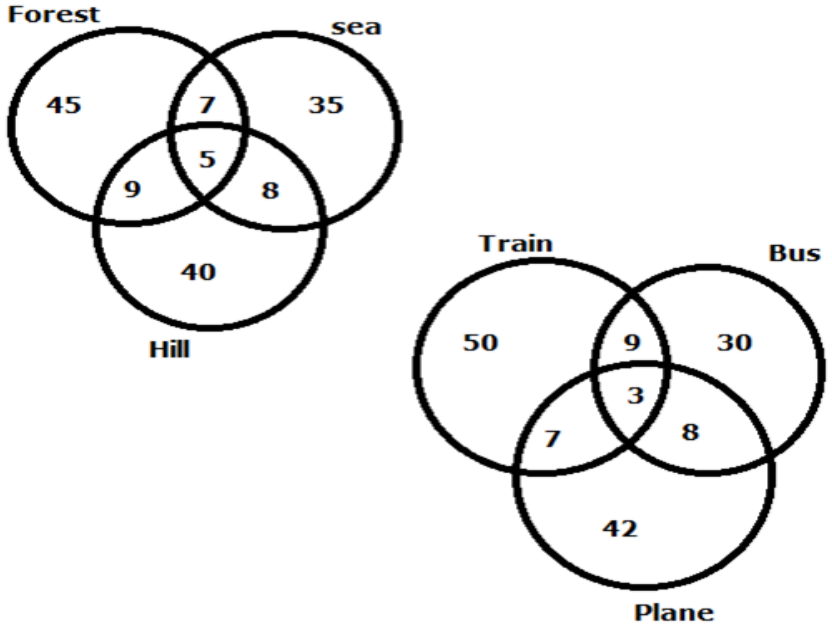
11.Option A
Solution:
Total expenditure in 2000 =32000+50000+4000+20000=106000.
Total expenditure in 2002 = 36000+70000+7000+28000=141000.
141000 == 100
106000 ? ==> 75%

12.Option D
Solution:
Total expenditure in 2001 =33000+65500+6000+25000= 129500
Total expenditure in 2003 = 40000+75000+8500+30000= 153500
Difference =153500-129500=24000.

13.Option C
Solution:
Loan =4000+6000+7000+8500+9000 =34500
Children's studies =32000+33000+36000+40000+42000=183000
Ratio 345 :1830==> 23:122.

{14 – 17}

Solution
Number of people like all three of bus, train and plane is 3.
Number of people like all three of Hill, forest and sea is 3+2=5
Number of people like only Hill is 5*8=40
Number of people like only forest is 40+5=45
Number of people like only Sea is 45*7/9=35
Number of people like only Bus is = 35-5=30
Number of people who like only Bus and plane but not train is 5+3=8=number of people who like both sea and hill but not forest
Number of people who like only plane is 40+2=42
Number of people who like only train is = 8*5+10=50
Number of people who like both train and plane not bus is
=60-3-8-42=7 = Number of people who like both forest and sea but not Hill
Number of people who like both who like both forest and hill but not Sea is = 62-5-8-40=9=Number of people who like both train and Bus but not plane.



14. Answer: C
Required ratio = [45+7+5+9+35+7+5+8]: [50+9+7+3+30+8+3+9]
=121:119

15. Answer: C
So, x = [9/8] *100=112.5
So, 5*112.5+9.65=572.15=572

16. Answer: C
So, m= [50+9+7+3+30+8] =107
So, n=42-30=12
So, (107*107) + (12*12) =11593

17. Answer: D
So, t=8 and s=7
So, t*s=8*7=56
Required value = 56*56=3136