

Questions 1 to 3 (1990) : GhoshBabu has a certain amount of property consisting of cash, gold coins and silver bars. The cost of a gold coin is Rs. 4000 and the cost of a silver bar is Rs. 1000. GhoshBabu distributed his property among his daughters equally. He gave to his eldest daughter gold coins worth 20% of the total property and Rs. 25000 in cash. The second daughter was given silver bars worth 20% of the remaining property and Rs. 50000 cash. He then gave each of the third and fourth daughters equal number of gold coins and silver bars both together accounting each for 20% of the property remaining after the previous distribution and Rs. 25000 more than what the second daughter had received in cash.

Q1. The amount of property in gold and silver possessed by GhoshBabu is
(a) 2,25,000
(b) 2,75,000
(c) Rs. 4,25,000
(d) None of these

Q2. Total property of GhoshBabu (in Rs.lakh) is
(a) 5.0
(b) 7.5
(c) 10.0
(b) 60
(d) 12.5.

Q3. If GhoshBabu had equal number of gold and silver bars, the number of silver bars he has is
(a) 90
(b) 60
(c) 75
(d) 55

Questions 4 to 8 (1991) : Read the following information and answer the questions that follows:
GhoshBabu deposited a certain sum of money in a bank in 1986. The bank calculated interest on the principal at 10 percent simple interest, and credited it to the account once a year. After the 1st year, GhoshBabu withdrew the entire interest and 20% of the initial amount. After the 2nd year, he withdrew the interest and 50% of the remaining amount. After the 3rd year, he withdrew the interest and 50% of the remaining amount. Finally after the 4th year, GhoshBabu closed the account and collected the entire balance of Rs. 11,000.

Q4. The initial amount in rupees, deposited by GhoshBabu was:
(a) 25,000
(b) 75,000
(c) 50,000
(d) None of these

Q5. The year, at the end of which, GhoshBabu withdrew the smallest amount was:
(a) First
(b) Second
(c) Third
(d) Fourth

Q6. The year, at the end of which, GhoshBabu collected the maximum interest was:
(a) First
(b) Second
(c) Third
(d) Fourth

Q7. The year, at the end of which, GhoshBabu withdrew the maximum amount was:
(a) First
(b) Second
(c) Third
(d) Fourth

Q8. The total interest, in rupees, collected by GhoshBabu was:
(a) 12,000
(b) 20,000
(c) 4,000
(d) 11,000

Q9 to 13 (1991) : Use the following information::
Prakash has to decide whether or not to test a batch of 1000 widgets before sending them to the buyer. In case he decides to test, he has two options: (a) Use test I ; (b) Use test II. Test I cost Rs. 2 per widget. However, the test is not perfect. It sends 20% of the bad ones to the buyer as good. Test II costs Rs. 3 per widget. It brings out all the bad ones. A defective widget identified before sending can be corrected at a cost of Rs. 25 per widget. All defective widgets are identified at the buyer's end and penalty of Rs. 50 per defective widget has to be paid by Prakash.

Q9. Prakash should not test if the number of bad widgets in the lot is:
(a) less than 100
(b) more than 200
(c) between 120 & 190
(d) Cannot be found out.

Q10. If there are 120 defective widgets in the lot, Prakash:
(a) should either use Test I or not test.
(b) should either use Test II or not test.
(c) should use Test I or Test II.
(d) should use Test I only.

Q11. If the number of defective widgets in the lot is between 200 and 400, Prakash:

- may use Test I or Test II
- should use Test I only.
- should use Test II only
- cannot decide.

Q12. If Prakash is told that the lot has 160 defective widgets, he should:

- use Test I only
- use Test II only.
- do no testing.
- either use Test I or do not test.

Q13. If there are 200 defective widgets in the lot, Prakash:

- may use either Test I or Test II
- should use Test I or not use any test
- should use Test II or not use any test.
- cannot decide.

Q14 to 17(1993) :

GhoshBabu has recently acquired four companies namely Arc – Net Technologies (ANT), Babu Anta Transport (BAT), Charles Anter Tailor (CAT) and Daud Akbar Transistors (DAT). When the results of the companies for the year 1992 – 93 were placed before him. He found a few interesting things about them. While the profits of CAT and DAT were the same, the sales of CAT were the same as those of BAT . Profits of ANT were 10% of its sales, where as the profits of BAT were 20% of its sales. While the total expenses of CAT were 5 times its profits, sales of DAT were 3 times its profits. The total expenses of CAT were Rs. 10,00,000, the total expenses of ANT were 10% less than those of CAT. Profits are defined as the difference between sales and total expenses.

Q14. Which company had the lowest sales?

- ANT
- BAT
- CAT
- DAT

Q15. Which company had the highest total expenses?

- ANT
- BAT
- CAT
- DAT

Q16. Which company had the lowest profits?

- ANT
- BAT
- CAT
- DAT

Q17. Which company had the highest profits.

- ANT
- BAT
- CAT
- DAT

Q18 TO 21 (1994): are based on the table and information given below. Answer the questions based on it.

Bankatlal works x hours a day and rests y hours a day. This pattern continues for 1 week, with an exactly opposite pattern next week, and so on for four weeks. Every fifth week he has a different pattern. When he works longer than he rests, his wage per hour is twice what he earns per hour when he rests longer than he works. The following are his daily working hours for the weeks numbered 1 to 13.

	1 st week	5 th week	9 th week	13 th week
Rest	2	3	4	-
Work	5	7	6	8

A week consists of six days and a month consists of 4 weeks.

Q18. If Bankatlal is paid Rs. 20 per working hour in the 1st week. What is his salary for the 1st month?

- Rs.1760
- Rs.1440
- Rs.1320
- Rs.1680

Q19. Referring to the data given in Q.187, Bankatlal's average monthly salary at the end of the first four months will be

- Rs.1780
- Rs.2040
- Rs.1830
- Rs.1680

Q20. The new manager Khushaldas stipulated that Rs.5 be deducted for every hour of rest and Rs. 25 be paid per hour starting 9th week, then what will be the change in Bankatlal's salary for the 3rd month? (Hourly deductions are constant for all weeks starting 9th week)

- Rs.540
- Rs.480
- Rs.240
- Rs.120

Q21. Using the data in the previous questions, what will be the total earning of Bankatlal at the end of sixteen weeks.

- Rs.7320
- Rs.7800
- Rs.8400
- Rs.9600

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Direction for questions 22 to 26 (1998): Answer the questions based on the following information. Krishna distributed 10-acre land to Gopal and Ram who paid him the total amount in the ratio 2 : 3. Gopal invested a further Rs. 2 lakh in the land and planted coconut and lemon trees in the ratio 5 : 1 on equal areas of land. There were a total of 100 lemon trees. The cost of one coconut was Rs. 5. The crop took 7 years to mature and when the crop was reaped in 1997, the total revenue generated was 25% of the total amount put in by Gopal and Ram together. The revenue generated from the coconut and lemon trees was in the ratio 3 : 2 and it was shared equally by Gopal and Ram as the initial amount spent by them were equal.

Colour	Rs./litre
RED	20
YELLOW	25
WHITE	15
ORANGE	22
PINK	18

- Q22. What was the total output of coconuts?
a. 24,000 b. 36,000 c. 18,000 d. 48,000
- Q23. What was the value of output per acre of lemon trees planted?
a. 0.24 lakh per acre b. 2.4 lakh per acre c. 24 lakh per acre d. Cannot be determined
- Q24. What was the amount received by Gopal in 1997?
a. Rs. 1.5 lakh b. Rs. 3 lakh c. Rs. 6 lakh d. None of these
- Q25. What was the value of output per tree for coconuts?
a. Rs. 36 b. Rs. 360 c. Rs. 3,600 d. Rs. 240
- Q26. What was the ratio of yields per acre of land for coconuts and lemons (in terms of number of lemons and coconuts)?
a. 3 : 2 b. 2 : 3 c. 1 : 1 d. Cannot be det

Directions for questions 27 to 29 (2003): Answer the questions on the basis of the information given below. Rang Barsey Paint Company (RBPC) is in the business of manufacturing paints. RBPC buys RED, YELLOW, WHITE, ORANGE, and PINK paints. ORANGE paint can be also produced by mixing RED and YELLOW paints in equal proportions. Similarly, PINK paint can also be produced by mixing equal amounts of RED and WHITE paints. Among other paints, RBPC sells CREAM paint, (formed by mixing WHITE and YELLOW in the ratio 70:30) AVOCADO paint (formed by mixing equal amounts of ORANGE and PINK paint) and WASHEDORANGE paint (formed by mixing equal amounts of ORANGE and WHITE paint). The following table provides the price at which RBPC buys paints.

- Q27. The cheapest way to manufacture AVOCADO paint would cost ?
(1) Rs.19.50 per litre.
(2) Rs.19.75 per litre.
(3) Rs.20.00 per litre.
(4) Rs. 20.25 per litre.
- Q28. WASHEDORANGE can be manufactured by mixing ?
(1) CREAM and RED in the ratio 14:10.
(2) CREAM and RED in the ratio 3:1.
(3) YELLOW and PINK in the ratio 1:1.
(4) RED, YELLOW, and WHITE in the ratio 1:1:2.
- Q29. Assume that AVOCADO, CREAM, and WASHEDORANGE each sells for the same price. Which of the three is the most profitable to manufacture?
(1) AVOCADO. (2) CREAM.
(3) WASHEDORANGE. (4) Sufficient data is not available.

Directions for questions 30 and 31 (2003): Answer the questions on the basis of the information given below. A certain perfume is available at a duty-free shop at the Bangkok international airport. It is priced in the Thai currency Baht but other currencies are also acceptable. In particular, the shop accepts Euro and US Dollar at the following rates of exchange: US \$1 = 41 Bahts and 1 Euro = 46 Bahts . The perfume is priced at 520 Bahts per bottle. After one bottle is purchased, subsequent bottles are available at a discount of 30%. Three friends S, R and M together purchase three bottles of the perfume . agreeing to share the cost equally. R pays 2 Euros. M pays 4 Euros and 27 Thai Bahts and S pays the remaining amount in US Dollars.

- Q30 How much does R owe to S in Thai Baht?
(1) 428 (2) 416 (3) 334 (4) 324
- Q31. How much does M owe to S in US Dollars?
(1) 3 (2) 4 (3) 5 (4) 6

Directions for questions 32 and 33 (2003): Answer the questions on the basis of the information given below. New Age Consultants have three consultants Gyani, Medha and Buddhi. The sum of the number of projects handled by Gyani and Buddhi individually is equal to the number of projects in which Medha is involved. All three consultants are involved together in 6 projects.

Gyaniworks with Medha in 14 projects. Buddhi has 2 projects with Medha but without Gyani, and 3 projects with Gyani but without Medha. The total number of projects for New Age Consultants is one less than twice the number of projects in which more than one consultant is involved.

Q32. What is the number of projects in which Gyani alone is involved?

- (1) Uniquely equal to zero. (2) Uniquely equal to 1.
(3) Uniquely equal to 4. (4) Cannot be determined uniquely.

Q33. What is the number of projects in which Medha alone is involved?

- (1) Uniquely equal to zero. (2) Uniquely equal to 1.
(3) Uniquely equal to 4. (4) Cannot be determined uniquely.

DIRECTIONS for Questions 34 to 37 (2004): Answer the questions on the basis of the information given below. Twenty one participants from four continents (Africa, Americas, Australasia, and Europe) attended a United Nations conference. Each participant was an expert in one of four fields, labour, health, population studies, and refugee relocation. The following five facts about the participants are given.

- (a) The number of labour experts in the camp was exactly half the number of experts in each of the three other categories.
(b) Africa did not send any labour expert. Otherwise, every continent, including Africa, sent at least one expert for each category.
(c) None of the continents sent more than three experts in any category.
(d) If there had been one less Australasian expert, then the Americas would have had twice as many experts as each of the other continents.
(e) Mike and Alfanzo are leading experts of population studies who attended the conference. They are from Australasia.

Q34. Which of the following numbers cannot be determined from the information given?

- (1) Number of labour experts from the Americas.
(2) Number of health experts from Europe.
(3) Number of health experts from Australasia.
(4) Number of experts in refugee relocation from Africa.

Q35. Which of the following combinations is NOT possible?

- (1) 2 experts in population studies from the Americas and 2 health experts from Africa attended the conference.
(2) 2 experts in population studies from the Americas and 1 health expert from Africa attended the conference.

- (3) 3 experts in refugee relocation from the Americas and 1 health expert from Africa attended the conference.
(4) Africa and America each had 1 expert in population studies attending the conference.

Q36. If Ramos is the lone American expert in population studies, which of the following is NOT true about the numbers of experts in the conference from the four continents?

- (1) There is one expert in health from Africa.
(2) There is one expert in refugee relocation from Africa.
(3) There are two experts in health from the Americas.
(4) There are three experts in refugee relocation from the Americas.

Q37. Alex, an American expert in refugee relocation, was the first keynote speaker in the conference. What can be inferred about the number of American experts in refugee relocation in the conference, excluding Alex?

- i. At least one ii. At most two
(1) Only i and not ii (2) Only ii and not i
(3) Both i and ii (4) Neither i nor ii

Answer questions 38 to 42 (2006): on the basis of the information given below.

Mathematicians are assigned a number called Erdős number, (named after the famous mathematician, Paul Erdős). Only Paul Erdős himself has an Erdős number of zero. Any mathematician who has written a research paper with Erdős has an Erdős number of 1. For other mathematicians, the calculation of his/her Erdős number is illustrated below:

Suppose that a mathematician X has co-authored papers with several other mathematicians. From among them, mathematician Y has the smallest Erdős number. Let the Erdős number of Y be y . Then X has an Erdős number of $y + 1$. Hence any mathematician with no co-authorship chain connected to Erdős has an Erdős number of infinity.

- In a seven day long mini-conference organized in memory of Paul Erdős, a close group of eight mathematicians, call them A, B, C, D, E, F, G and H, discussed some research problems. At the beginning of the conference, A was the only participant who had an infinite Erdős number. Nobody had an Erdős number less than that of F.

- On the third day of the conference F co-authored a paper jointly with A and C. This reduced the average Erdős number of the group of eight mathematicians to 3. The Erdős numbers of B, D, E, G and H remained unchanged with the writing of this

paper. Further, no other co-authorship among any three members would have reduced the average Erdős number of the group of eight to as low as 3.

- At the end of the third day, five members of this group had identical Erdős numbers while the other three had Erdős numbers distinct from each other.
- On the fifth day, E co-authored a paper with F which reduced the group's average Erdős number by 0.5. The Erdős numbers of the remaining six were unchanged with the writing of this paper.
- No other paper was written during the conference.

Q38. The person having the largest Erdős number at the end of the conference must have had Erdős number (at that time):

- (1) 5
- (2) 7
- (3) 9
- (4) 14
- (5) 15

Q39. How many participants in the conference did not change their Erdős number during the conference?

- (1) 2
- (2) 3
- (3) 4
- (4) 5
- (5) Cannot be determined

Q40. The Erdős number of C at the end of the conference was:

- (1) 1
- (2) 2
- (3) 3
- (4) 4
- (5) 5

Q41. The Erdős number of E at the beginning of the conference was:

- (1) 2
- (2) 5
- (3) 6
- (4) 7
- (5) 8

Q42. How many participants had the same Erdős number at the beginning of the conference?

- (1) 2
- (2) 3
- (3) 4
- (4) 5
- (5) Cannot be determined

Directions (Q6-10): The following information is about the production of cars by 3 different companies from Monday to Friday in a specific week. Read the information carefully and answer the following question:—

The total production by 3 companies on Monday was 540 out of which 100/3% cars were produced by Tata. The number of cars produced by Renault on Monday is less than the cars produced by Tata on Monday by the same extent as the number of cars produced by Maruti on Monday is more than the cars produced by Tata on Monday. The difference between cars produced by Renault and Maruti on Monday is 40.

150 cars are produced by Tata on Tuesday, which is 100 less than the cars produced by the same company on Wednesday. A total of 910 cars were produced by Tata from Monday to Friday. The ratio between cars produced by Tata on Thursday to cars produced by the same company on Friday is 5 : 6.

220 cars were produced by Renault on Tuesday, which is 80 less than the cars produced by Maruti on Wednesday. A total of 570 cars were produced on Tuesday, which is 76% of the total cars produced on Wednesday. The number of cars produced by Maruti on Thursday is 200/3% more than cars produced by Tata on the same day. Total 580 cars were produced on Thursday. The number of cars produced by Maruti on Friday is same as that on Monday. 140 cars were produced by Renault on Friday.

Q6. Find the ratio between total cars produced on Monday to that on Wednesday.

- (a) 18 : 29
- (b) 18 : 25
- (c) 18 : 31
- (d) 3 : 5
- (e) None of these

Q7. Find the total number of cars produced by Renault from Monday to Friday.

- (a) 900
- (b) 980
- (c) 950
- (d) 960
- (e) None of these

Q8. Find the average number of cars produced per day by Maruti from Monday to Friday. (approximate)

- (a) 250
- (b) 220
- (c) 270
- (d) 240
- (e) 230

Q9. On which pair of days out of the following, the number of cars produced by Tata is the same?

- (a) Tuesday and Wednesday
- (b) Wednesday and Thursday
- (c) Tuesday and Thursday
- (d) Monday and Wednesday
- (e) Monday and Tuesday

Q10. On which day the total number of cars produced was the maximum?

- (a) Monday
- (b) Tuesday
- (c) Wednesday
- (d) Thursday
- (e) Friday

Solutions (6-10)

	Monday	Tuesday	Wednesday	Thursday	Friday
Tata	180	150	250	150	180
Renault	160	220	200	180	140
Maruti	200	200	300	250	200
	540	570	750	580	520

S6. Ans.(b)

Sol.

$$\frac{540}{750} = 18 : 25$$

S7. Ans.(a)

Sol.

Total number of cars produced by Renault from Monday to Friday = 900

S8. Ans.(e)

Sol.

$$\text{Required average} = \frac{1150}{5} = 230$$

S9. Ans.(c)

Sol.

No. of cars produced on Tuesday and Thursday is same i.e. 150

S10. Ans.(c)

Sol.

Maximum number of cars produced = 750, on Wednesday.

Directions (Q1-4): Answer the questions based on the following information.

Venkat, a stockbroker, invested a part of his money in the stock of four companies.... A, B, C, D. Each of these companies belonged to different industries, viz, Cement,

Information Technology (IT), Auto and Steel, in no particular order. At the time of investment, the price of each stock was Rs. 100. Venkat purchased only one stock of each of these companies. He was expecting returns of 20%, 10%, 30% and 40% from the stock of companies A, B, C and D, respectively.

Returns are defined as the change in the value of the stock after one year, expressed as a percentage of the initial value. During the year, two of these companies announced extraordinarily good results. One of these two companies belonged to the Cement or the IT industry, while the other one belonged to either the Steel or the Auto industry. As a result, the returns on the stocks of these two companies were higher than the initially expected returns. For the company belonging to the cement or the IT industry with extraordinarily good results, the results were twice that of the initially expected returns. For the company belonging to the Steel or the Auto industry, the returns on the announcement of extraordinarily good results were only one and a half times that of the initially expected returns. For the remaining two companies, which did not announce extraordinarily good results, the returns realized during the year were the same as initially expected.

Q1. If Company C belonged to the Cement or the IT industry and did announce extraordinarily good results, then which of these statement(s) would necessarily be true?

- I. Venkat earned not more than 36.25% return on average.
 - II. Venkat earned not less than 33.75% return on average
 - III. If Venkat earned 33.75% return on average, Company A announced extraordinarily good results.
 - IV. If Venkat earned 33.75% return on average Company B belonged either to Auto or to Steel Industry.
- (a) I and II only
 - (b) II and IV only
 - (c) II and III only
 - (d) III and IV only
 - (e) None of these

S1. Ans.(b)

Sol. Given C... Cement or IT industry

C's return is $30 \times 2 = 60\%$

Among the other values we see that the possible arrangement can be

$$10 \times 1.5 + 20 + 40 + 60, 10 + 20 \times 1.5 + 40 + 60, 40 + 20 + 40 \times 1.5 + 60$$

The average returns will be in each case

$$\frac{10 \times 1.5 + 20 + 40 + 60}{4} (33.75\%)$$

$$\frac{10 + 20 \times 1.5 + 40 + 60}{4} (35\%)$$

$$\frac{40 + 20 + 40 \times 1.5 + 60}{4} (45\%)$$

Considering 33.75% as the valid value, then B belongs to the Auto industry. Hence, (II) and (IV) are correct. Therefore, options (b) is the correct choice.

Q2. In Venkat earned a 38.75% return on average during the year, then which of these statement(s) would necessarily be true?

- I. Company C belonged either to Auto or to Steel Industry.
 - II. Company D belonged either to Auto or to Steel Industry.
 - III. Company A announced extraordinarily good results.
 - IV. Company B did not announce extraordinarily good results.
- (a) I and II only
 (b) II and III only
 (c) I and IV only
 (d) II and IV only
 (e) None of these

S2. Ans. (c)

Sol. Total return is $38.75 \times 4 = 155$

The possible arrangement is

$$20 + 10 + 30 \times 1.5 + 40 \times 2$$

Hence, A = 20, B = 10, C = 30 (Steel or Auto)

D = 40 (Cement or IT)

Hence, statements (I) and (IV) are correct.

Q3. If Venkat earned a 35% return on average during the year, then which of these statements would necessarily be true?

- I. Company A belonged either to Auto or to Steel Industry.
 - II. Company B did not announce extraordinarily good results.
 - III. Company A announced extraordinarily good results.
 - IV. Company D did not announce extraordinarily good results.
- (a) I and II only
 (b) II and III only
 (c) III and IV only
 (d) II and IV only
 (e) None of these

S3. Ans. (b)

Sol. If the average return is 35%, then the total return is $35 \times 4 = 140$. The arrangement of 140 being $40 \times 1.5 + 30 + 20 \times 2 + 10$.

A = 20 × 2 (Cement or IT)

B = 10

C = 30

D = 40 (1.5) (Steel or Auto)

From the data given in the question we see that A has to be Cement or I D is Steel or Auto.

Hence, statements (II) and (III) are correct.

Q4. What is the minimum average return Venkat would have earned during the year?

- (a) 30%
 (b) 125/4%
 (c) 65/2%

- (d) Cannot be determined
 (e) None of these

S4. Ans. (a)

Sol. Taking the minimum value of the expected returns as 10. We have to see which of the two values of 10 and 20 multiplied by 2 and 1.5 and vice-versa yields the minimum value. Hence, comparing the minimum value between $20 \times 2 + 10 \times 1.5$ and $20 \times 1.5 + 10 \times 2$, the 2nd one is minimum.

Hence, the minimum average return is $\frac{20 + 15 + 10 \times 2 + 30 + 40}{4} = 30\%$

Directions (Q5-10): Answer the questions based on the following information.

Help Distress (HD) is an NGO involved in providing assistance to people suffering from natural disasters. Currently, it has 37 volunteers. They are involved in three projects: Tsunami Relief (TR) in Tamil Nadu, Flood Relief (FR) in Maharashtra and Earthquake Relief (ER) in Gujarat. Each volunteer working with Help Distress has to be involved in at least one relief work project.

I. A maximum number of volunteers are involved in the FR project. Among them, the number of volunteers involved in FR project alone is equal to the volunteers having additional involvement in the ER project

II. The number of volunteers involved in the ER project alone is double the number of volunteers involved in all the three projects.

III. 17 volunteers are involved in the TR project.

IV. The number of volunteers involved in the TR project alone is one less than the number of volunteers involved in ER project alone.

V. Ten volunteers involved in the TR project are also involved in at least one more project.

Q5. How many Volunteers are working in ER project alone?

- (a) 4
 (b) 8
 (c) 12
 (d) 7
 (e) None of these

Q6. How many volunteers are working in all three projects initially?

- (a) 4
 (b) 8
 (c) 12
 (d) 7
 (e) None of these

Q7. After the withdrawal of volunteers, as indicated in Question 4, some new volunteers joined the NGO. Each one of the them was allotted only one project in manner such that, the number of volunteers working in one project alone for each of the three projects became identical. At that point, it was also found that the number of volunteers involved in FR and ER projects was the same as the number of volunteers

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involved in TR and ER projects. Which of the projects, now has the highest number of volunteers?

- (a) ER
- (b) FR
- (c) TR
- (d) Cannot be determined
- (e) None of these

Q8. After some time, the volunteers who were involved in all the three projects were asked to withdraw from one project. As a result, one of the volunteers opted out of the TR project, out of the ER project, while the remaining ones involved in all the three projects opted out of the FR project. Which of the following statements, then necessarily follows?

- (a) The lowest number of volunteers in Now, in TR project
- (b) More volunteers are, now in FR project as compared to ER project
- (c) More volunteers are, now in TR project as compared to ER project
- (d) None of these
- (e) Can't be determined

Q9. Which of the following additional information would enable to find the exact number of volunteers involved in various projects?

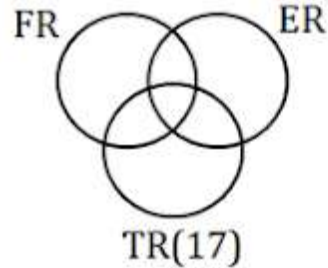
- (a) Twenty volunteers are involved in FR
- (b) Four volunteers are involved in all the three projects
- (c) Twenty-three volunteers are involved in exactly one project
- (d) No need for any additional information
- (e) None of these

Q10. Based on the information given above, the minimum number of volunteers involved in both FR and TR projects, but not in the ER project is

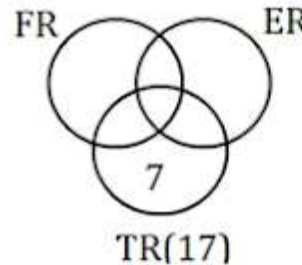
- (a) 1 (b) 3 (c) 4 (d) 5 (e) Can't be determined

Solutions (5-10):

- 17 in TR



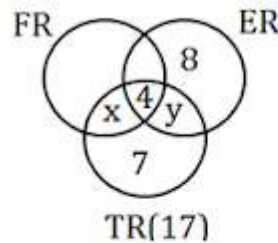
- 10 in TR also in at least one more
 $\Rightarrow 7$ in TR alone



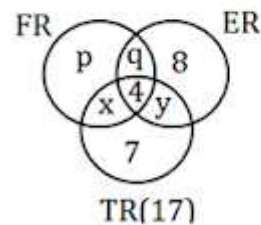
- TR alone = one less than ER alone

$$\Rightarrow \text{ER alone} = 8$$

- ER alone = double of all 3
 $\Rightarrow \text{In all three} = \frac{8}{2} = 4$



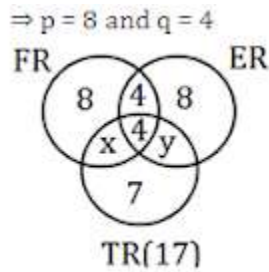
- FR alone = (FR and ER)



$$\Rightarrow p = q + 4$$

$$\text{Total} = 37$$

$$p + q = 37 - 8 - 17 = 12$$

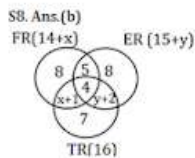


Now, total number of FR is maximum
 $\Rightarrow 8 + 4 + 4 + x > 8 + 4 + 4 + y$
 $\Rightarrow x > y$ and $x + y = 6$
 $\Rightarrow x = \{4, 5, 6\}$ $y = \{0, 1, 2\}$

S5. Ans. (b) It is clear from the Venn diagram.

S6. Ans. (a) It is clear from the Venn diagram.

S7. Ans. (d)
 Sol. FR and ER = 5
 ER and TR = $y + 2$
 $\Rightarrow 5 = y + 2 \Rightarrow y = 3$
 Hence, option (d) is correct answer.
 Because it is impossible to find the new volunteers.



Sol. Out of 4 who are in all the three, 2 move out of FR and one-one move out of ER and TR.
 Minimum in FR = $14 + x = 14 + 4 = 18$
 Maximum in ER = $15 + y = 15 + 2 = 17$
 Hence, option (b) is correct answer.

S9. Ans. (a)
 Sol. Option (b) and option (c) are superfluous. They are not required, option (a), if given would tell us the value of $x = 4$ and hence $y = 2$.

S10. Ans. (c)
 Sol. Both FR and TR but not ER = x
 Minimum $x = 4$

Directions (11-15): Answer the questions based of the following information.

Krishna distributed 10-acre land to Gopal and Ram who paid him the total amount in the ratio 2: 3. Gopal invested a further Rs. 2 lakh in the land and planted coconut and lemon trees in the ratio 5: 1 on equal areas of land. There were a total of 100 lemon trees. The cost of one coconut was Rs. 5. The crop took 7 yr to mature and when the crop was reaped in 1997, the total revenue generated was 25% of the total amount put in by Gopal and Ram together. The revenue generated from the coconut and lemon trees was in the ratio 3: 2 and it was shared equally by Gopal and Ram as the initial amounts spent by them were equal.

Q11. What was the ratio of yield per acre of land for coconuts and lemons (in terms of number of lemons and coconuts)?
 (a) 3: 2 (b) 2: 3 (c) 1: 1 (d) Cannot be determined
 (e) None of these

Q12. What was the value of output per tree for coconuts?
 (a) Rs 36 (b) Rs 360 (c) Rs 3,600 (d) Rs 240
 (e) None of these

Q13. What was the amount received by Gopal in 1997?
 (a) Rs. 1.5 lakh (b) Rs. 3 lakh (c) Rs. 6 lakh (d) None of these

Q14. What was the value of output per acre of the lemon tree planted?
 (a) 0.24 lakh/acre (b) 2.4 lakh/acre (c) 24 lakh/acres
 (d) Cannot be determined (e) None of these

Q15. What was the total output of coconuts?
 (a) 24,000 (b) 36,000 (c) 18,000 (d) 48,000
 (e) None of these

Solutions (11-15):

S11. Ans. (d)
 Sol. Data are insufficient to determine the required ratio.

S12. Ans. (b)
 Sol. Ratio of number of coconut trees and lemon trees = 5 : 1, therefore number of coconut trees is 500. Since, revenue generated from coconut trees is Rs. 1,80,000. Hence, value per tree = $\frac{1,80,000}{500} = \text{Rs. } 360$

S13. Ans. (a)
 Sol. Since revenue of Rs. 3,00,000 is equally divided by Gopal and Ram. Hence, amount received by Gopal in 1997 = $\frac{1}{2} \times 3,00,000 = \text{Rs. } 1,50,000$.

S14. Ans. (a)
 Sol. The value of lemon output per acre of land = $\frac{1,20,000}{5} = 0.24$ lakh/acre.

S15. Ans. (b)
 Sol. Let the amount invested by Gopal and Ram be $2x$ and $3x$ respectively. Gopal further invested Rs 2 lakh.
 Acc. to question
 $(2x + 2) = 3x$ or $x = 2$ lakh.
 Hence, initial amount paid by Gopal and Ram to Krishna is 4 lakh and 6 lakh respectively. Hence, total money invested by them together = $(6 + 6) = 12$ lakh.
 The total revenue generated = $12 \times 25\% = 3$ lakh.

Also The ratio of revenue from coconut and lemon trees are in the ratio 3 : 2.

Hence, revenue from coconut = Rs. 1,80,000 and revenue from lemons = Rs. 1,20,000. So total output of coconut = $\frac{1,80,000}{5} = 36,000$.

Directions (Q.11-15): Study the following data related to seven friends carefully to answer the questions that follow.

Parul, Niharika, Anshu, Pooja, Jyoti, Aditi and Komal are seven friends living along a straight road in same manner as given starting with Parul.

Pooja lives 150 km away from Parul, and takes 1 hr 40 min to reach to Aditi. It takes Parul 5 hours to reach to Aditi who lives 250 km away from her. When Anshu and Komal move toward each other at 70 k/hr and 50 km/hr respectively, they meet after 1 hr 35 min. Anshu takes only 240/7 min to reach to Pooja. Niharika being 240 km

away from Komal crosses Jyoti after 5 hr 40 min and meet Komal after 8 hours from start. Jyoti and Aditi meet after 24 minutes if they start moving simultaneously towards each other with speed in 3 : 2 ratio.
Note: Speed of all remains constant.

Q11. On a weekend, all friends decided to meet at Parul's house at 9 : 00 pm sharp. At what time should Jyoti leave her house to get at location in time if she spends 10 minutes waiting for Niharika at Niharika's house ?
(a) 2 : 10 pm (b) 2 : 45 pm (c) 1 : 10 pm (d) 1 : 30 pm (e) None of these

Q12. Niharika and her boyfriend together left their office at 6 : 30 pm and move towards their home with same speed as Niharika. Office is 120km away from Jyoti's house in opposite direction of Niharika's house. Find the distance of house of Niharika's boyfriend from her house if she dropped him at his home at 7 : 05 pm.
(a) 280 km (b) 265.5 km (c) 252 km (d) 272.5 km (e) None of these

Q13. Find the ratio of distance between residence of Parul and Komal and that of Anshu and Jyoti.
(a) 2 : 5 (b) 5 : 2 (c) 3 : 1 (d) 7 : 3 (e) None of these

Q14. All friends decided to meet at Pooja's house, with the condition that they have to move towards Pooja house with the speed of the next friend they meet in the way starting with Parul and Komal living at opposite ends. Find the difference in the time when the two groups reach at destination. (rounded off up to two decimal points)
(a) 0.52 hr (b) 2.31 hr (c) 1.23 hr (d) 2.51 hr (e) 1.82 hr

Q15. By what percent speed of Anshu is more or less than that of Komal ?
(a) 32% (b) 45% (c) 30% (d) 40% (e) None of these

Solutions

Solution Direction (11-15)

From the data,

Friends	speed (km/hr)	Distance (km) with reference to Parul
Parul	50	0
Niharika	30	60
Anshu	70	110
Pooja	60	150
Jyoti	30	230
Aditi	20	250
Komal	50	300

S11. Ans.(c)

Sol.

$$\text{Time taken by Jyoti} = \frac{230}{30} = 7 \text{ hr } 40 \text{ min}$$

$$\therefore \text{Total time taken} = 7 \text{ hr } 50 \text{ min}$$

i.e. she must leave her house at 1 : 10 pm

S12. Ans.(d)

Sol.

$$\text{Distance of office from Niharika house} = 170 + 120 = 290 \text{ km}$$

$$\text{Distance travelled by them in 35 minutes} = 30 \times \frac{35}{60} = 17.5 \text{ km}$$

$$\therefore \text{Distance of her boyfriend's house from her house} = 290 - 17.5 = 272.5$$

S13. Ans.(b)

Sol.

$$\text{Required ratio} = \frac{300}{230-110} = 5 : 2$$

S14. Ans.(c)

Sol.

Group I (Parul, Niharika and Anshu)

$$\text{Total time taken} = \frac{60}{50} + \frac{50}{30} + \frac{40}{70} = \frac{361}{105} \text{ hr}$$

Group II (Jyoti, Aditi, Komal)

$$\text{Total time taken} = \frac{50}{50} + \frac{20}{30} + \frac{80}{30} = \frac{14}{3} \text{ hr}$$

$$\therefore \text{Required time} = \frac{14}{3} - \frac{361}{105} = \frac{490-361}{105} = \frac{129}{105} \text{ hr.} \approx 1.23 \text{ hr}$$

S15. Ans.(d)

Sol.

$$\text{Required percent} = \frac{70-50}{50} \times 100 = 40\%$$