MBA PIONEER 2024

QUANTITATIVE APTITUDE

DPP: 5

Ratio & Proportion 3

Q1 A started a business investing some amount. B entered into the business 3 months after A by investing $4000. If the profit is distributed in the ratio of 4 : 3, then what was A's investment?

(A) $2000 (B) $3000
(C) $4000 (D) $6000

Q2 Suman & Sukhbeer started a business by investing $3000 and $2000 each. 2 months after that Sahev joined the business by investing $4000. 4 months after Sahev's investment, Ashwani joined the business and invested some money. If after the end of the year Ashwani got $\frac{9}{34}^{th}$ of the total profit, then how much money he invested (in $)?

(A) 6000 (B) 6250
(C) 6500 (D) 6750

Q3 Ramu is buying fruits in the market. The seller is selling fruits by quantity. Ramu realizes that his total expenses on fruits directly varies with the number of apples he buys. His total expense is Rs. 120 if he buys 5 apples. If he buys 15 apples, then what will be his total expenses (in Rs.)?

(A) 240 (B) 360
(C) 624 (D) 720

Q4 A sum of Rs. X is divided among A, B, C, and D in such a way that the share of A is one-fifth of Rs. X and share of B and C are in the ratio 3: 4. D receives Rs. 24120 and 5 times of the difference between the share of B and C is Rs. 15000. If the ratio of the combined share of A and C to that of B and D is 97: 138, then the value of X is:

(A) Rs. 56400 (B) Rs. 48200
(C) Rs. 64400 (D) Rs. 60400

Q5 The amount of rainfall in Kerala, Orissa and West Bengal were in the ratio 6 : 5 : 7 in 2017, and in the ratio 3 : 4 : 3 in 2022. If in the Kerala, the amount of rainfall is increased by 25% during 2017-2022, then the percentage increase in the amount of rainfall in West Bengal during this period is closest to:

(A) 5 (B) 6
(C) 7 (D) 8

Q6 x years ago, Bolu was 7 times as old as his only brother. y years from now, Bolu will be 3 times as old as his brother. If x : y = 1:2, then how many years from now will Bolu be twice as old as his brother ?

(A) 13x (B) 6.5x
(C) 2x + 3y (D) 5y - 1.5x

Q7 Simba is playing a Twenty-Two-card game with his friend. His chances of winning inversely varies with the score that his opponent player can achieve. If the score of his opponent player is 16, then the chances of his winning is $\frac{1}{4}$. If his chances of winning is $\frac{1}{3}$, then what will be the score of his opponent player?

(A) 12 (B) 14
(C) 15 (D) 18

Q8 When 6 is added to the numerator of a fraction and 15 is added to the denominator of a fraction then the fraction becomes $\frac{1}{2}$. And

when 9 is added to the numerator of original fraction and 4 is subtracted from the denominator of original fraction, then the fraction becomes $\frac{4}{3}$. Find the difference between the numerator and denominator of the original fraction.

(A) 7 (B) 8
(C) 5 (D) 3

Q9 A starts business with $2000 and after 6 months, B joins with A as his partner. C joined in sometime before the end of the year and invested $6000. After a year, the profit divided in the 4 : 5 : 3 among A, B & C respectively. Had B invested his amount for the same period of time as C what would have been his profit share out of a total profit of $1900?

(A) $ 400 (B) $ 500
(C) $ 600 (D) $ 450

Q10 A starts business with $2000 and after 6 months B joins with A as his partner. C joined in sometime before the end of the year and invested $6000. D joined a month after C joined the business with the same capital amount as that of B. The profit is shared among the 4 investors at the end of the year. The ratio of A, B & C's profit is 4 : 5: 3. What is C's profit if D got $500 as a share of his profit.

(A) $ 900 (B) $ 540
(C) $ 600 (D) $ 450

Q11 The cost of a solid golden ball varies with the square of the area. If a certain ball broke into 4 pieces whose areas are in the ratio of 8 : 6 : 5 : 1. As a result, its cost decreased by Rs. 57,540. What is the cost of the largest broken part of the ball (in Rupees)?

(A) 13440 (B) 13460
(C) 13420 (D) 14000

Q12 Ashwani ji and Sounak ji started a business by investing Rs. 18,000 and Rs. 20,000 respectively at the beginning of a year. After 8 months Ashwani ji invested Rs. 3000 more. If the yearly profit was Rs. 25,428, the share of Ashwani ji is:

(A) Rs. 12,388 (B) Rs. 13,244
(C) Rs. 16,256 (D) Rs. 14,248

Q13 Ashwani purchased a 60-seater Roller coaster loop. He provides his services in large fairs. His profit (P) from the Roller coaster is directly depends upon the number of riders over a certain minimum number of riders 'n' and upon the number of rounds moved by the Roller coaster. His profit is Rs. 2700 with 30 riders in the Roller coaster for 42 rounds and Rs. 5400 with 45 riders in the Roller coaster for 48 rounds. What is the minimum number of riders are required so that he will not suffer any loss?

(A) 12 (B) 10
(C) 18 (D) 15

Q14 The weight of a cylinder varies directly with the square of the radius when the height is constant and with the height when the radius is constant. What is the ratio of the radii of two cylinders of the same weights whose heights are in the ratio 9 : 25?

(A) 27 : 125 (B) 3 : 5
(C) 6 : 25 (D) 5 : 3

Q15 A cylinder is partitioned into 3 parts, whose volumes are in the ratio of 2: 3: 1. Pressure of a gas is directly proportional to its mass and inversely proportional to its volume. If the masses of the gas in the 3 chambers are the same, find the ratio of the pressures of the gases in the 3 chambers taking them in the same order as the volumes have been taken.

(Assume no factors other than those mentioned play a role).

(A) 3: 2: 1 (B) 1: 2: 3

(C) 6: 3: 2 (D) 3: 2: 6

Q16 Three Entrepreneurs A, B, and C have started a business by investing Rs. 6000, Rs. 9000 and Rs. 11000 respectively. They also took an amount as a bank loan. At the end of year, they made a profit of Rs. 19500. After paying the annual bank installment of Rs. 4186 they divided the remaining money of the profit among themselves in the ratio of their capitals. What is the difference of profit (in Rs.) between B and C?

(A) 1067 (B) 1089

(C) 1156 (D) 1178

Q17 Three friends Abir, Babar, Cantor took loans of Rs. 4800, Rs. 6400 and Rs. 3600 respectively from a co-operative bank on the condition that they would not have to pay interest, if they would repay their loan within two years. They invested the money to purchase 2 Electric Vehicles. After two years they made a profit of Rs. 35,150 excluding all the expenses. They divide the profit among themselves in the ratio of their capitals and repay back their individual loans amount to the bank. Then, the difference of amount of shares between Abir and Cantor after repayment of loan is :

(A) Rs. 1250 (B) Rs. 1650

(C) Rs. 2050 (D) Rs. 1450

Q18 A started a business with $2000. He further invested the same amount of money in the 2nd and 3rd month as well. B invested $4000 in the beginning of the 7th, 8th and 9th months. C invested $6000 each at the beginning of the 11th and 12th month. As A has been actively involved with the business, he got 20% of the profit as his salary. The remaining amount is then shared between A, B & C. If A received profit of $1700 at the end of the year, then how much will be B's share?

(A) $1100 (B) $1200

(C) $1000 (D) $800

Q19 Distance covered by a bus is directly proportional to the time taken and varies directly as the square root of diesel used and inversely proportional to the number of people in a bus. A bus covers a 60 km journey in 10 hours, when there are 10 people on the bus and total diesel consumption is 144 liters. Find the consumption of diesel per km (in litre/km) when a bus goes 200 km in 25 hours with 10 people in a bus. [Up to 2 decimal places]

Q20 Kiran appears in six different papers in his semester examination, where the maximum marks were 50 for each paper. His marks in these papers are in the proportion 8: 9: 10: 13: 14: 15. Considering his aggregate in all the papers together, he fails to obtain 50% of the total marks. What is the minimum possible additional marks Kiran should get to obtain 50% of the total marks, given that he got integral marks in each paper?

(A) 10 (B) 11

(C) 12 (D) 18

Q21 A sum of amount divided among A, B and C. The ratio of amount received by A and B together to the amount received by B and C together is 18: 23 and the ratio amount received by A and C together to the amount received by B and C together is 20:23. If A received Rs 750, then find the amount received by B.

(A) Rs 1020 (B) Rs 990

(C) Rs 1050 (D) Rs 1250

Q22 The total salary of Rajesh, Deepak and Pankaj is Rs. 1136. If they spend 84%, 82% and 75% of their salaries respectively, their savings are 8 : 10.8 : 8. Then, find the salary of Rajesh and Deepak are:
(A) Rs. 507, Rs. 323
(B) Rs. 270, Rs. 507
(C) Rs. 423, Rs. 270
(D) Rs. 400, Rs. 480

Q23 In a business, Avesh, Vimal and Yogesh invested some money for the same time. $\frac{6}{13}$ of the Avesh investment is equal to the $\frac{3}{13}$ of the sum of Yogesh's and Vimal's investment. Yogesh invested Rs. 2000 more than Vimal's investment, and Vimal invested Rs. 25000. The ratio of the profit of all three is___:___:___ The total profit is Rs _____ if out of the total profit Avesh gets Rs. 5200 ?
(A) 26:27:28, 20000
(B) 26:25:27, 15600
(C) 20:1:22, 16000
(D) 21:25:27, 57000

Q24 Bulbul & Ashwani started a business where they initially invested $1000 & $2000 respectively. 3 months later Sahev joined the business and invested some money. After 3 more months Sounak joined the business and invested some more money. As Bulbul was actively working in the business she takes some percentage of the profit as salary. The remaining profit is distributed among the shareholders as per their investment. After the end of the first year all 4 of them received equal amount of profit then find out the % of profit Bulbul claims as her salary.
(A) 10% (B) 12.5%
(C) 15% (D) 20%

Q25 In a wedding ceremony, the ratio of people from the bride's side to the groom's side was 5:6. Out of the people from the bride's side, the ratio of the number of males to females was 3:7. Out of the females from the bride's side, the ratio of females dressed in traditional and non-traditional was 1:3. What is the minimum number of people who attended the weddings?
(A) 1760 (B) 880
(C) 440 (D) 88

Q26 4 friends A, B, C & D invested some money not more than $2000 and not less than $1000 each at the start of the year in a company. After 2 months A again invested $2000. 2 months after A's investment, B invested $2000. 2 Month's after B's investment C invested $2000 and 2 months after that D invested $2000. If the profits are equally distributed among the four friends then in what ratio A, B, C & D invested at the start of the year?
(A) 2 : 4 : 5 : 6 (B) 3 : 4 : 5 : 6
(C) 1 : 2 : 3 : 4 (D) 2 : 3 : 4 : 5

Q27 The speed of a truck without any load is 40 kmph. The speed diminishes by a quantity that is proportional to the cube root of the weight (in tons) it carries. Its speed is 34 kmph when it carries a load of 27 tons. What is the maximum load (in tons) it can carry so that its speed does not fall below 30 kmph?

Q28 Ashutosh and Binod started a business together by investing some money. At the end of the first year, out of a total profit of Rs. 40,000, Ashutosh received Rs. 8,000 more than Binod. If Ashutosh had invested Rs. 120000 more and Binod had invested Rs. 1,20,000 less, Ashutosh would have received 25% more than what he actually received. What would have been the profit

share of Binod, if Ashutosh's investment and Binod's investment had been less by Rs. 60,000 and Rs. 1,40,000 respectively and the profit had decreased by 20%?

(A) Rs. 9,600 (B) Rs. 5,760
(C) Rs. 6,720 (D) Rs. 7,200

Q29 Three persons Asmita, Sushmita and Gourav, as per their agreement, are to share their three-day tour expenses such as Asmita's share is two-thirds of Sushmita share and Gourav's share is $33\frac{1}{3}\%$ more than Sushmita's share. On the first day, Asmita pays the bill which amounts to Rs. 3310. The second day's bill amounting to Rs. 5220 was cleared by Sushmita while Gourav cleared the last day's bill for Rs. 6230. During the final settlement of their accounts, which of the following happens?

(A) Gourav pays Rs. 30 to Asmita and Rs. 300 to Sushmita
(B) Asmita pays Rs. 300 to Sushmita
(C) Sushmita pays Rs. 240 to Asmita and Rs. 90 to Gourav
(D) Gourav pays Rs. 60 to Asmita and Rs. 270 to Sushmita

Q30 Bheema Jewellers is a well-known diamond jewellery shop. Owner of the shop has priced his diamond necklaces such that the cost of each necklace is varied as the square of the number of diamonds. For example, if a necklace has 8 diamonds then the cost is Rs. 1,60,000. Price for all necklaces is to be found by this method with no additional charges. Ravi wants to gift 3 diamond necklaces, one each for his mother, wife, and sister. He asks the owner of Bheema Jewellers to divide the 10 diamonds in a necklace in the ratio of 5: 3: 2 and create 3 different necklaces. What is the loss or gain (in Rs.) to Ravi?

(A) Rs. 1,00,000 (B) Rs. 1,55,000
(C) Rs. 2,50,000 (D) Rs. 95,000

Answer Key

Q1	(C)
Q2	(A)
Q3	(B)
Q4	(A)
Q5	(C)
Q6	(B)
Q7	(A)
Q8	(B)
Q9	(B)
Q10	(A)
Q11	(A)
Q12	(A)
Q13	(B)
Q14	(D)
Q15	(D)
Q16	(D)
Q17	(B)
Q18	(C)
Q19	1.28
Q20	(C)
Q21	(C)
Q22	(D)
Q23	(B)
Q24	(B)
Q25	(D)
Q26	(B)
Q27	125
Q28	(A)
Q29	(A)
Q30	(B)

Hints & Solutions

Q1 Text Solution:

Let's assume that A invested $x at the start of the year.

B invested $4000 for 9 months.

Thus the ratio in which the profit will be distributed will be 12x : (4000×9)

So,

$\frac{12x}{36000} = \frac{4}{3}$

=> $\frac{x}{12000} = \frac{1}{3}$

=> x = 4000

Hence, A's investment amount is $4000.

Q2 Text Solution:

Let us assume that Ashwani invested $x.

Name	Investment	Tenure	Total
Sumit	$ 3,000.00	12	$36,000
Sukhbeer	$ 2,000.00	12	$24,000
Sahev	$ 4,000.00	10	$40,000
Ashwani	$ x	6	$6x
			1,00,000 + 6x

So, total investment

$$= (\$3000 \times 12 + \$2000 \times 12 + \$4000 \times 10 + \$6x) = \$(6x + 100000)$$

So, according to the question,

$$\frac{6x}{6x + 100000} = \frac{9}{34}$$
$$=> 204x = 54x + 900000$$
$$=> 150x = 900000$$
$$=> x = 6000$$

Hence, Ashwani invested $\$6000$ in the business.

Q3 Text Solution:

Let E be the total expenses of Ramu on fruits, A be the numbers of apples Ramu buys, respectively.

Then, E ∝ A

=> E ∝ A

=> E = k A [k be the variation constant]

If E = 120, A = 5, then

120 = k × 5

=> k = 24

Again, if A = 15, then

E = 15 × 24

= Rs. 360

Hence, his total expenses will be Rs. 360.

Q4 Text Solution:

Share of A= Rs. $\frac{X}{5}$

Share of D = Rs. 24120

Let share of B and C are Rs. 3Y, and Rs. 4Y respectively.

According to the question,

5× (4Y - 3Y) = 15000

Y = Rs. 3000

Share of B = Rs. 9000

Share of C = Rs. 12000

According to the question,

$\frac{(\frac{X}{5}) + 12000}{9000 + 24120} = \frac{97}{138}$

$\frac{(X + 60000)}{(5 \times 33120)} = \frac{97}{138}$

X + 60000 = 97 × 1200

X + 60000 = 116400

X = 116400 - 60000

X = 56400

Q5 Text Solution:

The amount of rainfall in Kerala, Orissa and West Bengal were in the ratio 6: 5: 7 in 2017

In 2022, the amount of rainfall is in the ratio 3: 4: 3 respectively.

It is also given that; the amount of rainfall in Kerala increases by 25% during 2017 - 2022

So, the amount of rainfall in Kerala in 2022 = $\frac{5}{4}$ × 6 = 7.5

The amount rainfall in 2022 = 3 : 4 : 3 (Given)

The amount of rainfall in 2022= 7.5 : x : y (From data)

3 in order to jump to 7.5, must be multiplied by 2.5

So, multiplying 2.5 to all the other values,

Rainfall in 2022 = 7.5: 10: 7.5

Percentage increase in the amount of rainfall in West Bengal during 2017 - 2022

= Percentage increase from 7 to 7.5

= $\frac{0.5}{7}$ × 100, which is close to 7%.

Q6 Text Solution:

Let a be age of Bolu's brother x years ago when Bolu was 7 times as old as him

Bolu's age x years ago = 7a

The present age of Bolu and his brother is 7a + x and a + x.

y = 2x (given in the question) and two years from now the age of Bolu and his brother is 7a + 3x and a +3x.

Bolu will be 3 times as old as his brother in y years from now.

7a+3x = 3(a+3x)

4a = 6x

a = 1.5x

Substitute a = 1.5x in the present age of Bolu and his brother.

Bolu's present age = 11.5x

Bolu brother's present age = 2.5x

Now let us take k years from now Bolu's age will be twice as old as his brother.

11.5x + k = 2(2.5x + k)

k = 6.5x

Q7 Text Solution:

Let the chances of his winning be P and the score of his opponent player be S.

Then, P ∝ $\frac{1}{S}$

=> P = $\frac{k}{S}$, where k is a variation constant.

Given that, P = $\frac{1}{4}$ and S = 16, then

$\frac{1}{4}$ = k × $\frac{1}{16}$

=> k = 4

Again, if P = $\frac{1}{3}$, then

$\frac{1}{3}$ = $\frac{4}{S}$

=> S = 12

Hence, the score of the opponent player is 12.

Q8 Text Solution:

Let the numerator of original fraction = X

And the denominator of original fraction = Y

According to the question,

$\frac{(X+6)}{(Y+15)}$ = $\frac{1}{2}$

2X + 12 = Y + 15

2X - Y = 3 ...(1)

And,

$\frac{(X+9)}{(Y-4)}$ = $\frac{4}{3}$

3X + 27 = 4Y - 16

3X - 4Y = -43

4Y - 3X = 43 ...(2)

From equation (1) and (2),

We get, X = 11 and Y = 19

Required difference = 19 - 11 = 8.

Q9 Text Solution:

A's total investment is \$2000 × 12 = \$24000

Let us assume the B invested a capital of \$x.

Also let us assume that C invested for a period of t months.

So,

24000 : 6x : 6000t = 4 : 5: 3

=> $\frac{24000}{6x}$ = $\frac{4}{5}$

=> $\frac{4000}{x}$ = $\frac{4}{5}$

=> x = 5000

Hence, B invested \$5000.

Also,

$\frac{24000}{6000t}$ = $\frac{4}{3}$

=> t = 3

Hence, C invested for 3 months.

Had B invested the same amount for 3 months instead of 6 months, the ratio of A, B & C's share will be 4 : 2.5 : 3

= 8 : 5 : 6

So, B would have gotten $\frac{5}{8+5+6}$ = $\frac{5}{19}$ of the profit.

So, B would have gotten 5 × $\frac{\$1900}{19}$ = $500 of the profit.

Q10 Text Solution:

A's total investment is $2000×12 = $24000

Let us assume that B invested a capital of $x.

Also let us assume that C invested for a period of t months.

So,

24000 : 6x : 6000t = 4 : 5: 3

=> $\frac{24000}{6x}$ = $\frac{4}{5}$

=> $\frac{4000}{x}$ = $\frac{4}{5}$

=> x = 5000

Hence, B invested $5000.

Also,

$\frac{24000}{6000t}$ = $\frac{4}{3}$

=> t = 3

Hence, C invested for 3 months.

So, D invested $5000 for 2 months. Hence the ratio of C's profit and D's profit is (6000×3) : 5000×2 = 9 : 5

So, C's profit will be $\frac{9}{5}$ times that of D's profit.

So, the profit amount for C is $900.

Q11 Text Solution:

Let's say the areas are 8k, 6k, 5k, and k square units.

So the area of the golden ball before breaking= 8k + 6k + 5k + k = 20k square units.

Since the cost varies as the square of the area,

So, the cost of golden ball before breaking = $(20k)^2p$ = Rs. $400k^2p$ [where p is the proportional constant]

So, the cost of the first broken part

= $(8k)^2p$ = Rs. $64k^2p$

The cost of second broken part

= $(6k)^2p$ = Rs. $36k^2p$

The cost of third broken part

= $(5k)^2p$ = Rs. $25k^2p$

The cost of fourth broken part = Rs. k^2p

The total cost of broken par

= Rs. ($64k^2p$ + $36k^2p$ + $25k^2p$ + k^2p)

= Rs. $126k^2p$

Difference in cost

=Rs.($400k^2p$ - $126k^2p$) = Rs.$274k^2p$

It is given that the decreased cost is Rs. 57,540

So, $274k^2p$ = 57540

k^2p = $\frac{57540}{274}$ = 210

So the cost of largest broken part = Rs. $64k^2p$

= Rs 64 × 210

= Rs. 13,440

Hence, option A is correct.

Q12 Text Solution:

Ashwani ji's initial investment

$$= 18000 \text{ for a year}$$
$$= 18000 \times 12$$
$$= \text{Rs. } 2,16,000$$

Later, Aswaniji invested = Rs. 3000 for 4 months

$$= 3000 \times 4$$
$$= \text{Rs. } 12,000$$

So, Aswaniji's total investment in a year

$$= \text{Rs. } (2,16,000 + 12,000)$$
$$= \text{Rs. } 2,28,000$$

And Sounak ji's investment in a year = Rs. $20,000 \times 12$ = Rs. $2,40,000$

Hence, the ratio of capital invested $= 2,28,000 : 2,40,000$

$$= 19 : 20$$

Total profit = Rs. 25,428

So, the share of Aswaniji $= 25,428 \times \frac{19}{19+20}$

$$= \text{Rs. } 12,388.$$

Q13 Text Solution:

The minimum number of riders n, at which there is no loss.

The number of riders travelling = m

The number of rounds is d.

Then, P ∝ (m-n) d

or, p = k (m – n) d, where k is a constant.

When P = 2700, m = 30 and d = 42, then

2700 = k (30 – n) × 42 ... (1)

Again, when p = 5400, m = 45, d = 48, then

5400 = k (45 – n) × 48 ... (2)

Dividing equation (2) by (1)

$\frac{5400}{2700} = \frac{k(45-n)\times 48}{k(30-n)\times 42}$

=> 210 - 7n = 180 - 4n

=> 30 = 3n

=> n = 10.

Q14 Text Solution:

Let W be the weight, H be the height and R be the radius of the cylinder. Then,

$W \propto R^2 H$; i.e., $W = k \times R^2 \times H$

Let r_1 and h_1 be the radius and height of one cylinder and r_2 and h_2 be the radius and height of the second. Since W is the same for both, so

$r_1{}^2 \times h_1 = r_2{}^2 \times h_2$

$\frac{r_1{}^2}{r_2{}^2} = \frac{h_2}{h_1} = \frac{25}{9}$

$\frac{r_1}{r_2} = \frac{5}{3}$

The ratio of the radii is 5 : 3.

Q15 Text Solution:

Let P be the pressure, M be the mass and V be the volume of the gas.

Then, $P \propto \frac{M}{V}$;

Given, M is the same in all three chambers.

Let the Volumes be 2x, 3x and x. Then

$P_1 : P_2 : P_3 = \frac{1}{2} : \frac{1}{3} : \frac{1}{1} = 3 : 2 : 6$.

Q16 Text Solution:

Given, 3 Entrepreneurs, A, B and C, started a partnership business by investing Rs. 6000, Rs. 9000 and Rs. 11000 respectively for a year.

Ratio of partnership = 6000 × 12 : 9000 × 12 : 11000 × 12

= 6 : 9 : 11

Total profit = Rs. 19500

Annual bank installment paid at the end of a year

Remaining profit = Rs. 19500 – Rs. 4186

= Rs. 15,314

A's profit = $15,314 \times \frac{6}{6+9+11}$ = Rs. 3534

B's profit = $15,314 \times \frac{9}{6+9+11}$ = Rs. 5301

C's profit = $15,314 \times \frac{11}{6+9+11}$ = Rs. 6479

The required difference = C's profit – B's profit

= Rs. (6479 – 5301)

= Rs. 1178.

Q17 Text Solution:

Given, 3 friends Abir, Babar and Cantor, started a partnership business by taking bank loans of Rs. 4800, Rs. 6400 and Rs. 3600.

Ratio of partnership = 4800 : 6400 : 3600

= 12 : 16 : 9

Total profit = 35,150

Abir's profit = $\frac{12}{37} \times 35150$ = Rs. 11,400

Babar's profit = $\frac{16}{37} \times 35,150$ = Rs. 15,200

Cantor's profit = $\frac{9}{37} \times 35,150$ = Rs. 8550

Hence, Abir's, Babar's and Cantor's share after they have returned their respective Loans:

Abir's share = Rs. 11,400 – 4800 = Rs. 6600

Babar's share = Rs. 15,200 – 6400 = Rs. 8800

Cantor's share = Rs. 8550 – 3600 = Rs. 4950

The required difference = Abir's share - Cantor's share

= Rs. 6600 – 4950

= Rs. 1650.

Q18 Text Solution:

A's total investment after time-aligning will be \$2000 × 12 + \$2000× 11 + \$2000 × 10

= \$2000 × 33 = \$66000.

B's total investment after time-aligning will be \$4000 × 6 + \$4000 × 5 + \$4000 × 4 = \$60000.

C' total investment after time-aligning will be \$6000 × 2 + \$6000

= \$18000

So, the ratio of A's investment to C's investment will be 66 : 18 = 11 : 3.

The ratio of A's investment to B's investment will be 66 : 60 = 11 : 10.

However, as A worked actively in the project, he gets 20% of profit as a salary.

Let, us assume that the profit is \$ P. B's share will be $\frac{4P}{5} \times \frac{10}{24} = \frac{P}{3}$

So, A's share will be = $\frac{P}{5} + \frac{4P}{5} \times \frac{11}{24} = \frac{17P}{30}$

So,

$\frac{17P}{30}$ = \$1700

=> P = \$3000

=> $\frac{P}{3}$ = \$1000

So, B's share will be \$1000.

Q19 Text Solution:

Let, Distance $= D$, fuel consumption $= (f)$, time $= (t)$ and number of persons $= (n)$.

According to the question,

$D \propto \frac{t \times \sqrt{F}}{n}$

$\Rightarrow D = \frac{K \times t \times \sqrt{F}}{n}$ [K is constant]

$\Rightarrow 60 = \frac{K \times 10 \times \sqrt{144}}{10}$

$$\Rightarrow K = 5$$

Now,

$$200 = \frac{5 \times 25 \times \sqrt{F}}{10}$$

$$\Rightarrow \sqrt{F} = 16$$

$$\Rightarrow F = 256 \text{ litres}$$

Consumption of diesel per $km = \frac{256}{200} = 1.28$ litre $/km$

Q20 Text Solution:

Given, Max. marks for each paper = 50;

Therefore, Total marks = 300

50% of total marks = 150.

Let the marks in each subject be 8x, 9x, 10x, 13x, 14x, and 15x

Therefore, Total Marks = 69x

Given, 69x < 150;

Therefore, x = 1 or 2.

The minimum marks required to achieve 50% of the total marks is when x = 2.

So, 69x = 69 × 2 = 138.

So, a minimum of 12 marks are required.

Ans. c

Q21 Text Solution:

(A + B) : (B + C) =18 : 23

(A + C) : (B + C) = 20 : 23

(A + B) : (B + C) : (A + C) : =18 : 23 : 20

A + B =18k, B + C = 23k and A + C = 20k

2(A + B + C) =18k + 23k + 20k

A + B + C = $\frac{61k}{2}$

Share of A = $\frac{61k}{2}$ - 23k

= $\frac{15k}{2}$

Share of A = $\frac{15k}{2}$ =750

k = 100.

The amount received by B = $\frac{61k}{2}$ – 20k = $\frac{21k}{2}$

= $\frac{21}{2}$ × 100

= 1050.

Q22 Text Solution:

Let Rs. a, Rs. b and Rs. c be the salaries of Rajesh, Deepak and Pankaj respectively.

According to the question: a + b + c = Rs. 1136 ..... (i)

Expenses of Rajesh = 0.84a ⇒ Savings of Rajesh = 0.16a

Expenses of Deepak = 0.82b ⇒ Savings of Deepak = 0.18b

Expenses of Pankaj = 0.75c ⇒ Savings of Pankaj = 0.25c

∴ 0.16a : 0.18b : 0.25c = 8 : 10.8 : 8 = 8k : 10.8k : 8k

⇒0.16a = 8k, 0.18b = 10.8k and 0.25c = 8k

∴ a = 50k, b = 60k and c = 32k ..... (ii)

From equations (i) and (ii), we get:

50k + 60k + 32k = 1136

⇒ 142k = 1136 ⇒ k = 8

∴The salary of Rajesh = Rs. 50 × 8 = Rs.400

The salary of Deepak = Rs. 60 × 8 = Rs. 480

The salary of Pankaj = Rs. 32 × 8 = Rs.256

Thus, the salaries of Rajesh and Deepak = Rs. 400, Rs. 480

Thus, option D) is correct.

Q23 Text Solution:

$$\text{Vimal investment } = \text{ Rs. } 25000,$$

Yogesh's investment

$$=\text{Rs. } 25000 + \text{ RS. } 2000 = \text{ Rs. } 27000$$

Let Avesh's investment = Rs. x

$$\frac{6}{13} \times x = \frac{3}{13} \times (25000 + 27000)$$

$$x = 26000$$

$$\text{Ratio of profit}$$

$$= 26000 : 25000 : 27000 = 26 : 25 : 27$$

$$\text{For Avesh, 26 units } = 5200$$

$$1 \text{ unit } = \frac{5200}{26} = 200$$

Total profit = 200×78 units = Rs. 15600

Hence, option B.

Q24 Text Solution:

Let us assume that the total profit is 8x which gets distributed among all the 4 investors after giving away the salary to Bulbul.

Bulbul gets money from two sources -

1. Salary (Let's say that is a).

2. Share of the remaining money as per investment and tenure (Let's call that as b).

So, (a + b) = Ashwani's share of profit = Sahev's share of Profit = Sounak's share of Profit [As given in the question]

As all 4 of them receives equal amount of money, they will receive $\frac{8x}{4}$ = 2x each.

=> (a+b) = 2x

Also as Ashwani's investment is twice that of Bulbul's, so

b = $\frac{2x}{2}$ = x

So, (a + b) = 2x

=> a = (2x - x) = x

Hence, Bulbul claims $(\frac{x}{8x}) \times 100\%$ = 12.5% of the profit as salary.

Q25 Text Solution:

If we assume the total number of people as N, the number of people from the Bride's side will be $\frac{5}{11}N$ and from the groom's side will be $\frac{6}{11}N$.

Similarly, the number of females from the bride's side will be $\frac{7}{10} \times \frac{5}{11}N$.

Also, the number of females wearing traditional dresses will be :

$$\frac{1}{4} \times \frac{7}{10} \times \frac{5}{11} \times N$$

$= \frac{1}{4} \times \frac{7}{2} \times \frac{1}{11} \times N$ (Here, you can also consider the number of females wearing non-traditional).

For all the numbers of people to be integers, the total number of people must be a product

of $4, 2, 11$.

The least such number is 88 .

Q26 Text Solution:

Let's assume that the investment by A, B, C & D at the start of the year is $a, $b, $c & $d respectively.

The ratio in which they got their profit is 1:1:1:1

So,

12a + 2000 × 10 = 12b + 2000 × 8 = 12c + 2000 × 6 = 12d + 2000 × 4

=> 12(d - a) = 2000×6

=> (d - a) = 1000

As the minimum investment is $1000, thus, a = $1000, d = $2000

Now,

12 × 1000 + 2000 × 10 = 12b + 2000 × 8

=> 12b = 16000

=> b = $\frac{16000}{12} = \frac{4000}{3}$

Also,

12×1000 + 2000×10 = 12c + 2000×6

=> $\frac{20000}{12}$ = c

=> c = $\frac{5000}{3}$

So, a : b : c : d = 1000 : $\frac{4000}{3}$: $\frac{5000}{3}$: 2000

=> a : b : c : d = 3 : 4 : 5 : 6

Q27 Text Solution:

Reduction in Speed $\propto \sqrt[3]{w}$

From 40 km/hr to 34 km/hr reduction in speed is 6 km/hr.

Thus, 6 $\propto \sqrt[3]{27}$

6 = k $\sqrt[3]{27}$, where k is a proportionality constant

6 = 3k

k = 2

Thus, for speed to be not below 30 kmph, i.e., ≥ 30 kmph

(40 – 30) ≥ kW$\frac{1}{3}$

Or, 2(W)$\frac{1}{3}$ ≤ 10

Or, (W)$\frac{1}{3}$ ≤ 5

Or, W ≤ 125 tons.

Q28 Text Solution:

Let the profit shares of Ashutosh and Binod be a and b.

a + b = 40000 -------(i)

a – b = 8000 -------(ii)

Solving, a = 24000, b = 16000

i.e. a : b = 3 : 2.

The ratio of investments of Ashutosh and Binod = 3 : 2.

If the investments of Ashutosh and Binod are 3x and 2x,

Then,

$\frac{3x + 120000}{2x - 120000} = \frac{24000 \times 1.25}{40000 - 24000 \times 1.25}$

$\Rightarrow \frac{3x + 120000}{2x - 120000} = \frac{3}{1}$

i.e., 3x + 120000 = 6x – 360000

=> 3x = 480000

i.e., x = 160000

Now, if the respective investments were decreased by 60000 and 140000 then,

Ratio of profit = (480000 – 60000) : (320000 – 140000) = 420000 : 180000 = 7 : 3

Share of Binod in profit = $\frac{3}{10}$ of 80% of 40000 = Rs 9600

Q29 Text Solution:

Let x, y and z in Rs. be respective shares of Asmita, Sushmita and Gourav.

According to the question,

$$x = \frac{2}{3} \text{ of } y$$

$$\Rightarrow x : y = 2 : 3$$

Further,

$$z = \left(1 + \frac{1}{3}\right) y$$

$$\Rightarrow > y = \frac{3}{4} z$$

$$\Rightarrow y : z = 3 : 4$$

Thus $x : y : z = 2 : 3 : 4$

Now, total bill they pay $= 3310 + 5220 + 6230 = 14760$

As per the agreement,

Asmita's share $= \frac{2}{9} \times (14760) =$ Rs. 3280

Sushmita's share $= \frac{3}{9} \times (14760) =$ Rs. 4920

Gourav's share $= \frac{4}{9} \times (14760) =$ Rs. 6560 Now,

	Asmita	Sushmita	Gourav
Share of each as per agreement	3280	4920	6560
Bill amount paid	3310	5220	6230
Amount paid more	30	300	--
Amount paid less	--	--	330

Hence, Gourav pays Rs. 30 to Asmita and Rs. 300 to Sushmita for the final settlement of their accounts.

Q30 Text Solution:

Given $P \propto n^2$

$P = kn^2$

Given $160000 = k(8)^2$

or, $k = 2500$

Let the diamonds in three necklaces be 5, 3 and 2, then the original necklace would have had 10 diamonds.

$P_1 = 2500 \times 5^2 = 62500$;

$P_2 = 2500 \times 3^2 = 22500$ and

$P_3 = 2500 \times 2^2 = 10000$

So, total cost = Rs. 95,000

Original necklace, $P = 2500 \times 10^2 = 2,50,000$

Ravi Gains = Rs. 1,55,000/-