Betting Solutions :

Questions 1 to 4 :

Students, please note that the best way to solve thisquestion is by working backwards. e.g. after the 4thround, each one of them has Rs. 32. Since it is Vibhawho lost in this round, all the remaining three must havedoubled their share. In other words, they would havehad Rs. 16 each after the 3rd round. Since the increasein Rs. 16 in ones share, i.e. Rs. 48 overall, comes fromVibha's share, her share before the 4th round will be (32+ 48) = Rs. 80, after the 3rd round. Working backwards in this manner, we can get the following table:

	Share of each			
	Suvarna	**Tara**	**Uma**	**Vibha**
4. Vibha	32	32	32	32
3. Uma	16	16	16	(32 + 48) = 80
2. Tara	8	8	(16 + 40 + 8 + 8) = 72	40
1. Suvarna	4	(8 + 4 + 36 + 20) = 68	36	20
Initial	(4 + 34 + 18 + 10) = 66	34	18	10

Q1. c

Suvarna started with Rs. 66.

Q2. d

It was Vibha who started with the lowest amount, viz.Rs. 10.

Q3. a

It was Suvarna who started with the highest amount,viz. Rs. 66.

Q4. b

At the end of the second round, Uma had Rs. 72.

Solution for Q5 to Q8 :

Q5 . At the time of investment, the total price of the four stocks was Rs. 400 Total expected returns = (20 + 10 + 30 + 40) = Rs. 100 Venkat would earn the minimum average return when the companies with the two lowest expected returns would give 2 times and 1.5 times their expected returns.

Thus, minimum expected returns = 20 × 1.5 + 10 × 2 + 30 + 40 = Rs.120 = 30% of initial investment Hence, option 1.

Q6. Venkat earned 35% average return i.e. Rs. 140.

∴ He earned Rs. 40 more than expected.

∴ 40 = x + 0.5y,

where x and y correspond to expected returns on stocks that gave extraordinarily good results.

∴ 0.5y = 40 – x

But x and y can be 20, 10, 30 or 40.

If x = 20, y = 40, which is possible

If x = 10, y = 60, which is not possible

If x = 30, y = 20, which is possible

If x = 40, y = 0, which is not possible

Thus, Company A with x = 20 necessarily announced extraordinarily good results

along with company C or D. B did not announce extraordinarily good results.

Hence, option 2.

Q7. Venkat earned a return of 38.75% = Rs. 155

∴ He earned Rs. 55 more than expected.

∴ 55 = x + 0.5y

where x and y correspond to expected returns on stocks that gave

extraordinarily good results.

But x and y can be 20, 10, 30 or 40.

If x = 20, y = 70, which is not possible.

If x = 10, y = 90, which is not possible.

If x = 30, y = 50, which is not possible.

If x = 40, y = 30, which is possible.

Thus company C and company D announced returns that were respectively one

and a half and two times the initially expected returns.

∴ Company C belonged to either Auto or Steel Industry and Company A and B did

not announce extraordinarily good results.

Statements I and IV are true.

Hence, option 3.

Q8. Company C gave a return of Rs.60.

∴ Total returns will be the minimum possible when B gives 1.5 times the initially expected returns.

∴ Total returns would be 20 + 15 + 60 + 40 = Rs.135 = 33.75%

Statement II is true.

Also, when returns are 33.75%, company B belongs to Auto or Steel Industry.

Statement IV is true and Statement III is false.

Total returns will be the maximum possible when D gives 1.5 times the initially expected returns.

∴ Total returns would be 20 + 10 + 60 + 60 = Rs.150 = 37.5%

Statement I is false.

Hence, option 2.

Solution for Q9 to Q13 :

Q9. Let the price of the share rise on x days and fall on y days.

As the price increases by Rs.10 in the five days, we have:

x + y = 5 and 10x – 10y = 10

Thus, x = 3 and y = 2

The price of the share goes up on 3 days and falls on 2 days.

The three days on which the price rises can be selected in 5C3 = 10 ways

The following are the 10 cases:

		Day 1	Day 2	Day 3	Day 4	Day 5	Chetan		Michael	
							Cash	**Shares**	**Cash**	**Shares**
Case 1	**Opening**	100	110	120	130	120	1300	-10	3700	-30
	Closing	110	120	130	120	110				
Case 2	**Opening**	100	90	80	90	100	1300	-10	-800	10
	Closing	90	80	90	100	110				
Case 3	**Opening**	100	90	100	110	120	1300	-10	1200	-10
	Closing	90	100	110	120	110				
Case 4	**Opening**	100	110	100	110	100	1300	-10	0	0
	Closing	110	100	110	100	110				
Case 5	**Opening**	100	110	120	110	120	1300	-10	2400	-20
	Closing	110	120	110	120	110				
Case 6	**Opening**	100	110	120	110	100	1300	-10	1200	-10
	Closing	110	120	110	100	110				
Case 7	**Opening**	100	90	100	110	100	1300	-10	0	0
	Closing	90	100	110	100	110				
Case 8	**Opening**	100	110	100	110	120	1300	-10	1200	-10
	Closing	110	100	110	120	110				
Case 9	**Opening**	100	90	100	90	100	1300	-10	0	0
	Closing	90	100	90	100	110				
Case 10	**Opening**	100	110	100	90	100	1300	-10	0	0
	Closing	110	100	90	100	110				

Consider Case 5

Chetan sells on Days 1, 2 and 4 and buys on days 3 and 5.

Change in the number of shares he has = -30 + 20 = -10
Change in his cash = 10 × (110 + 120 + 120) – 10 × (110 + 110) = Rs 1300

Michael sells on days 2 and 4, but never buys as the share price does not go
below Rs.90.
Change in the number of shares he has = -20
Change in his cash = 10 × (120 + 120) = Rs 2400

The other cases are evaluated in a similar manner.
Chetan sold on three consecutive days => Cases 1, 2 and 3.
Michael sold only once => Case 3.
∴ The price of the share at the end of day 3 = Rs 110
Hence, option 3.

Q10 Referring to the formulated table of the first question, Michael ends up with Rs
100 less cash than Chetan in cases 3, 6 and 8. In each of these cases, both of them
hold the same number of shares at the end of day 5.
Hence, option 5.

Q11. This information corresponds to cases 4, 7, 9 and 10 from the solution table. The
price at the end of day 4 in each of these cases is Rs 100.
Hence, option 2.

Q12. The maximum increase in combined cash balance of Chetan and Michael = 1300
+ 3700 = Rs 5000 (case 1 from the table)
Hence, option 4.

Q13. This information corresponds to case 2 from the table. The price at the end of
day 3 was Rs 90.
Hence, option 1.

Solution for Q14 to Q18 :
Q14. 1
Firstly, let us try to understand the way the investments of the three traders behave. Abdul buys shares at 10 am everyday and sells them at a particular price at 3 pm. So his return is determined by the difference in the share price at these two times. Bikram and Chetan buy shares at equal intervals. But since Chetan buys them in equal amount he would end up buying more when the price is less and less when the price is more. Whether the prices are continuously rising or continuously falling down or in a fluctuating market, Chetan always has a higher proportion of lower priced shares as compared to Bikram. This increases his profit in a rising market and reduces his loss in a falling market. Therefore Chetan never has return lower than that of Bikram. We have explained this concept by taking examples. For more depth we have also provided the theoretical explanation. The theoretical explanation is only for better understanding and may not be suitable in a test environment.
Consider the scenario when the share price keeps rising throughout the day.
Let the share price at 10 am be Rs. 100, 11 am be
Rs. 110, 12 noon be Rs. 140, 1 pm be Rs. 150, 2 pm be
Rs. 180, and finally at 3 pm be Rs. 200.

Time of the Day	Share Price (in Rs.)
10 am (open)	100
11 am	110
12 noon	140
1 pm	150
2 pm	180
3 pm (close)	200

Abdul buys shares at Rs. 100 at 10 am and sells them aRs. 200 at 3 pm.
Abdul's return is 100%.
Let Bikram buy one share at each interval. So, at 10 amhe buys a share for Rs. 100; at 11 am, he buys a sharefor Rs. 110; at 12 noon, he buys a share for Rs. 140; at 1pm, he buys a share for Rs. 150; and at 2 pm, he buys a share for 180 × 1 = Rs. 180.
Thus, he buys a total of 5 shares for 100 + 110 + 140 + 150 + 180 = Rs. 680
At 3 pm, he sells all 5 shares for 200 × 5 = Rs. 1,000. Thus, his profit will be 1,000 – 680 = Rs. 320

$$\text{Hence, Bikram's return is } \frac{320}{680} \times 100 \approx 47\%$$

Let Chetan invest Rs. 415,800 at each interval.
So, at 10 am, he buys 415800/100 = 4158 shares;
at 11 am, he buys 415800/110 = 3780 shares;
at 12 noon, he buys 415800/140 = 2970 shares;
at 1 pm, he buys 415800/150 = 2772 shares;
at 2 pm, he buys 415800/180 = 2310 shares.
Thus, he buys 4158 + 3780 + 2970 + 2772 + 2310 = 15990 shares for 415800 × 5 = Rs. 20,79,000. He sells these shares for 200 × 15990 = Rs. 31,98,000. His profit will be 3198000 – 2079000 = Rs. 11,19,000.

$$\text{Hence Chetan's returns } = \frac{1119000}{2079000} \times 100$$

$$= \frac{373}{693} \times 100 \approx 53\%$$

From the above example, we see that in case of continuously rising share prices, Abdul's return > Chetan's return > Bikram's return Thus, Bikram gets the minimum return on a "boom"day.
Hence, option 1.

Note: Theoretical Explanation:
Let x1, x2, … , x6 be the share prices at 10 am, 11 am, 12 noon, 1 pm, 2 pm and 3 pm respectively.
For Abdul:
Abdul buys shares at Rs. x1 and sells them at Rs. x6.

$$\therefore \text{Abdul's returns} = \frac{x_6 - x_1}{x_1}$$

For Bikram:
Let Bikram have bought n shares at each hourly interval.
His investment amount = nx1 + nx2 + nx3 + nx4 + nx5 = n(x1 + x2 + x3 + x4 + x5)

$$= n \times \sum_{i=1}^{5} x_i$$

At 3 pm, he sells his shares for $(5n \times x_6)$

Hence, his profit/loss $= (n \times 5x_6) - n \times \sum_{i=1}^{5} x_i$

$$= n \times \left(5x_6 - \sum_{i=1}^{5} x_i\right)$$

$$\therefore \text{ Bikram's returns } = \frac{n \times \left(5x_6 - \sum_{i=1}^{5} x_i\right)}{n \times \sum_{i=1}^{5} x_i}$$

$$= \frac{5x_6}{\sum_{i=1}^{5} x_i} - 1 = \frac{x_6}{\frac{\sum_{i=1}^{5} x_i}{5}} - 1$$

Hence, Bikram's returns

$$= \frac{x_6}{(\text{Arithmetic Mean of } x_1 \ x_2, \ldots\ldots \ x_5} - 1$$

For Chetan:

Let Chetan invest Rs. P at each hourly interval.

His investment amount = $5P$

Since he invests Rs. P at each interval, he buys:

$\frac{P}{x_1}$ shares at 10am; $\frac{P}{x_2}$ at 11am; and so on until

At 3 pm, he sells each share at x_6. So, for all his s

he receives,

$$\text{Rs.} \left(\frac{P}{x_1} + \frac{P}{x_2} + \frac{P}{x_3} + \frac{P}{x_4} + \frac{P}{x_5}\right) \times x_6$$

$$= Px_6 \times \left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5}\right)$$

Hence, his profit/loss =

$$= Px_6 \times \left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5}\right) - 5P$$

$$= P \times \left[x_6 \times \left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5}\right) - 5\right]$$

$\therefore$ Chetan's returns =

$$= \frac{P\left[x_6\left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5}\right) - 5\right]}{5P}$$

$$= \frac{x_6\left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5}\right) - 5}{5}$$

$$= \frac{x_6\left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5}\right)}{5} - 1$$

$$= \frac{x_6}{\frac{5}{\left(\frac{1}{x_1} + \frac{1}{x_2} + \frac{1}{x_3} + \frac{1}{x_4} + \frac{1}{x_5}\right)}} - 1$$

$\therefore$ Chetan's returns =

$$\frac{x_6}{(\text{Harmonic Mean of } x_1 \ x_2, \ldots\ldots \ x_5} - 1$$

Now, let's compare Bikram's and Chetan's returns. Since Arithmetic Mean is always greater than *or equal to* the Harmonic Mean, Chetan's returns will be greater than *or equal to* Bikram's.

Q 15.

Since Chetan's return is always higher than or equal to that of Bikram, the trader with the maximum return would be either Abdul or Chetan. If it is a continuously rising market then Abdul would end up having the highest gain as seen in the example above. But there might be a scenario when the share price of XYZ would go down after 10 AM and rise in the end at 3 PM to a higher value.

In such a case, if Chetan gets the shares at lower prices than what the price was at 10 AM he would end up making more profit and hence higher return.

Time of the Day	Share Price (in Rs.)
10 am (open)	100
11 am	110
12 noon	140
1 pm	150
2 pm	180
3 pm (close)	200

Here, Abdul's returns remain unaltered as 100%.

Let Chetan always buy shares worth Rs. 100.

So he would end up buying 1 + 10 + 10 + 10 + 10 = 41 shares.

When he sells the same at Rs. 200 he gets Rs. 8,200 for the same.

Chetan's profit = 8200 – 500 = 7700

$$\therefore \text{ Chetan's return} = \frac{7700}{500} > 100\%$$

Q16. From the explanation seen till now we can rule out options 1, 3 and 4.

Now, option 2 is only partially correct. We have seen that Chetan's return would be higher than or equal to that of Bikram. It would be equal to Bikram's return in the scenario when the share price remains at a constant value throughout the day.

Option 2 is not always true.

Hence, option 5.

Q17.
Let x1, x2, … , x6 be the share prices at 10 am, 11 am, 12 noon, 1 pm, 2 pm and 3 pm respectively.
Now, since Abdul lost money in the transaction,
x1 > x6 Also, it is given that, x1 > x3, and x6 > x5
Combining the above, we have,
x1 > x6 > x5 and x1 > x3,
Also, let the money Emily invests at 10 am be Rs. P.
Then, Her investment = Rs. P

And the number of shares she buys $= \frac{P}{x_1}$

So, after selling these shares at 12 noon, she will get

Rs.$\frac{P}{x_1} \times x_3$

Now, she invests this money at 1 pm, and the number of shares she buys $\frac{P\ x_3}{x_1\ x_4}$.

So after selling these shares at 3pm, she gets

Rs.$\frac{P\ x_3}{x_1\ x_4} \times x_6$

So her returns $= \dfrac{\frac{P\ x_3\ x_6}{x_1\ x_4} - P}{P} = \frac{x_3\ x_6}{x_1\ x_4} - 1$

Since she made profit, her returns > 0;

i.e. $\frac{x_3\ x_6}{x_1\ x_4} - 1 > 0$ or $\frac{x_3\ x_6}{x_1\ x_4} > 1$

Now, we know that $x_1 > x_6$; so $\frac{x_1}{x_6}$ cannot be > 1.

$\therefore \frac{x_3}{x_4}$ has to be > 1; i.e. $x_3 > x_4$

$\therefore$ The share price at 12 noon is greater than that at 1 pm.
Hence, option 4 is definitely false.

Also, since in the first half, Emily invests at 10 am and sells at 12 noon, and we know that the share price at 10 am was greater than at 12 noon; hence she must have suffered a loss during this transaction. However, she makes a net profit in the end. So, she must have made profit during the second part of the transaction; i.e. the share price at 1 pm must have been less than that at 3 pm.
i.e. x4 < x6,
Also, let Dane buy n shares at 10 am, 11 am and 12 noon.
Hence, her investment = n(x1 + x2 + x3)
And she sells these at 1 pm, 2 pm and 3 pm for n(x4 + x5 + x6)

$$\therefore \text{Her returns} = \frac{n(x_4 + x_5 + x_6) - n(x_1 + x_2 + x_3)}{n(x_1 + x_2 + x_3)}$$
$$= \frac{(x_4 + x_5 + x_6)}{(x_1 + x_2 + x_3)} - 1$$

Since she made profit, her returns are greater than 0;

i.e. $\frac{(x_4 + x_5 + x_6)}{(x_1 + x_2 + x_3)} - 1 > 0$ or $\frac{(x_4 + x_5 + x_6)}{(x_1 + x_2 + x_3)} > 1$

Hence, $(x_4 + x_5 + x_6) > (x_1 + x_2 + x_3)$
Since, $x_1 > x_6$ and $x_3 > x_4$, hence $x_5 > x_2$
So far, we have,
$x_1 > x_6 > x_5 > x_2$, $x_4 < x_6$ and $x_1 > x_3 > x_4$

Now from Dane's investment, we know that,
(x4+ x5+ x6) – (x1+ x2+x3) > 0 … (i)
Keeping in mind the relationships between the share prices, we have
x6 = x1 – b
x4 = x1 – b – c
x3 = x1 – b – c + a
x5 = x1 – d, where a, b, c and d are all positive.
Substituting the above in equation (i), we have,
(x1 – b – c + x1 – d + x1 – b) – (x1 + x2 + x1 – b – c + a) > 0
x1 – x2 > b + d + a (which is > 0, since all the variables are positive)
i.e. x1 > x2
x2 < x1 – b – a – d
x2 is definitely less than x6 and x5.
Although we don't know when the share price is at its lowest, we do know that x5 > x2.
x5, i.e. the share price at 2 pm is not the lowest.
Hence, option 1 is also definitely false.
Thus, there are two options which are correct for this question. This is an ambiguity and therefore, we are not indicating any option as correct.

Q18. From the solution of the first question of the set, we can see that,
x1 > x6 > x5 > x2, x4 < x6 and x1 > x3 > x4 x1, i.e. the share price at 10 am, is the highest.
Hence, option 1.

Solution for Q19 to Q 22 :
Q19. Let there be x members in the IOC.
As a member cannot vote if his or her city is in contention, the number of voters
in Round 1 (R1) = x – 4
The number of voters in Round 2 (R2) = x – 3 and
The number of voters in Round 3 (R3) = x – 2 – n
Where n is the number of voters who have voted for New York (NY) in R1 and
Beijing (B) in R2.
Given x – 3 = 83, x – 4 = 82 and x – 2 – n = 75 => n = 9
21 members voted for B in R2. Out of these, 9 voted for NY in R1.

The remaining 12 who voted for B comprised 75% of those who voted for B in R1.
Thus 12/0.75 = 16 members voted for B in R1.
∴ Paris (P) got 82 ‑ 16 ‑ 30 ‑ 12 = 24 votes in R1.

All those who voted for London (L) and P in R1 continued to vote for the same
cities in subsequent rounds. Thus, 24 voters of P in R2 had voted for P in R1 too.
Also from the given information, 3 voters who had voted for NY in R1 voted for
Paris in R2.
Out of the remaining 5 that voted for P in R2, 4 had voted for Beijing in R1 and 1
vote came from the member who represented NY.
In R3, the difference in the votes cast for L and P was 1. => L and P got 37 and 38
votes in some order.

The composition of 75 voters of R3 was as follows:
12 members who had voted for B in R1 and R2 were eligible for voting in R3.
30 and 24 members who voted for L and P in R1 continued to do so in R3.
4 voters of R3, voted for B in R1 and P in R2.
3 voters of R3, voted for NY in R1 and P in R2.
1 member represented NY and 1 represented B.
From given information, 50% of voters of B in R1 i.e. 8 voted for P in R3 => 8 out
of the 12 who voted for B in R1 and R2, voted for London in R3.

The information can be summarised as shown in the table:

Required percentage = 9 × 100/ 12 = 75%

Hence, option 4.

	R1	R2	Composition of votes of R2	R3	Composition of votes of R3
London	30	30	30 who voted for London in R1	38	30 who voted for London in R1
NY	12	0		0	
Paris	24	32	24 who voted for Paris in R1	37	24 who voted for Paris in R1
			+ 3 who voted for NY in R1		+ 3 who voted for NY in R1 and P in R2
			+ 1 representing NY		+ 1 representing NY
			+ 4 who voted for Beijing in R1		+ 1 representing NY
					+ 4 who voted for Beijing in R1 and P in R2
					+ 1 member representing Beijing
Beijing	16	21		0	
			12 who voted for Beijing in R1		
			+ 9 who voted for NY in R1		
Total	82	83		75	

Q20 As can be seen from the formulated table in the first question, 24 votes were cast
for Paris in R1.

Hence, option 4.

Q21. From the explanation given earlier, required percentage
= 8 × 100/12 = 66.67%
Hence, option 4.

Q22. It can be clearly seen from the explanation given earlier that only statement a is
true.
Hence, option 1.