

CAT 2017 Expected paper

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**IIMs or Nothing**

# Logic Section

# CAT 2017

Answer the following questions based on the information given below: In a sports event, six teams (A, B, C, D, E and F) are competing against each other. Matches are scheduled in two stages. Each team plays three matches in Stage – I and two matches in Stage – II. No team plays against the same team more than once in the event. No ties are permitted in any of the matches. The observations after the completion of Stage – I and Stage – II are as given below.

Stage-I:

- One team won all the three matches.
- D lost to A but won against C and F.
- B lost at least one match.
- Two teams lost all the matches.
- E lost to B but won against C and F.
- F did not play against the top team of Stage-I.

Stage-II:

- The leader of Stage-I lost the next two matches
- Of the two teams at the bottom after Stage-I, one team won both matches, while the other lost both matches.
- Once more team lost both matches in Stage-II.

1. The two teams that defeated the leader of Stage-I are:

- (1) F & D (2) E & F (3) B & D (4) E & D (5) F & D

2. The only team(s) that won both matches in Stage-II is (are)

- (1) B (2) E & F (3) A, E & F (4) B, E & F (5) B & F

3. The teams that won exactly two matches in the event are

- (1) A, D & F (2) D & E (3) E & F (4) D, E & F (5) D & F

4. The team(s) with the most wins in the event is (are)

- (1) A (2) A & C (3) F (4) E (5) B & E

Answer the following questions based on the information given below:

Abdul, Bikram and Chetan are three professional traders who trade in shares of a company XYZ Ltd. Abdul follows the strategy of buying at the opening of the day at 10 am and selling the whole lot at the close of the day at 3 pm. Bikram follows the strategy of buying at hourly intervals: 10 am, 11am, 12 noon, 1 pm. And 2 pm, and selling the whole lot at the close of the day. Further, he buys an equal number of shares in each purchase. Chetan follows a similar pattern as Bikram but his strategy is somewhat different. Chetan's total investment amount is divided equally among his purchases. The profit or loss made by each investor is the difference between the sale value at the close of the day less the investment in purchase. The "return" for each investor is defined as the ratio of the profit or loss to the investment amount expressed as a percentage.

5. On a day of fluctuating market prices, the share price of XYZ Ltd. ends with a gain, i.e, it is higher at the close of the day compared to the opening value. Which trader got the maximum return on that day?

- (1) Bikram (2) Chetan (3) Abdul (4) Bikram or Chetan (5) cannot be determined

6. Which one of the following statements is always true?

- (1) Abdul will not be one with the minimum return  
(2) Return for Chetan will be higher than that of Bikram  
(3) Return for Bikram will be higher than that of Chetan  
(4) Return for Chetan cannot be higher than that of Abdul  
(5) none of the above

7. On a "boom" day the share price of XYZ Ltd. keeps rising throughout the day and peaks at the close of the day. Which trader got the minimum return on that day?

- (1) Bikram (2) Chetan (3) Abdul (4) Abdul or Chetan (5) cannot be determined

8. On a "bear" day the share price of XYZ Ltd. keeps falling throughout the day and is lowest at the close of the day. Which trader got the maximum return on that day?

- (1) Bikram (2) Chetan (3) Abdul (4) Abdul or Chetan (5) cannot be determined

Answer the following questions based on the statements given below:

- (i) There are three houses on each side of the road.  
(ii) These six houses are labeled as P, Q, R, S, T and U.

- (iii) The houses are of different colours, namely, Red, Blue, Green, Orange, Yellow and White.
- (iv) The houses are of different heights.
- (v) T, the tallest house, is exactly opposite to the Red coloured house.
- (vi) The shortest house is exactly opposite to the Green coloured house.
- (vii) U, the Orange coloured house, is located between P and S.
- (viii) R, the Yellow coloured house, is exactly opposite to P.
- (ix) Q, the Green coloured house, is exactly opposite to U.
- (x) P, the White coloured house, is taller than R, but shorter than S and Q.

9. What is the colour of the tallest house? \_\_\_\_\_
10. What is the colour of the house diagonally opposite to the Yellow coloured house? \_\_\_\_\_
11. Which is the second tallest house? \_\_\_\_\_
12. Which of the pair is odd combination (1) PR (2) UQ (3) ST (4) UR \_\_\_\_\_

Five horses, Red, White, Grey, Black and Spotted participated in a race. As per the rules of the race, the persons betting on the winning horse get four times the bet amount and those betting on the horse that came in second get thrice the bet amount. Moreover, the bet amount is returned to those betting on the horse that came in third, and the rest lose the bet amount. Raju bets Rs. 3000, Rs. 2000 and Rs. 1000 on Red, White and Black horses respectively and ends up with no profit and no loss.

13. Which of the following cannot be true?
  - (1) At least two horses finished before Spotted
  - (2) Red finished last
  - (3) There were three horses between Black and Spotted
  - (4) There were three horses between White and Red
  - (5) Grey came in second
14. Suppose, in addition, it is known that Grey came in fourth. Then which of the following cannot be true?
  - (1) Spotted came in first
  - (2) Red finished last
  - (3) White came in second
  - (4) Black came in second
  - (5) There was one horse between Black and White
15. Suppose, in addition, it is known that White came in Second. Then which of the following must be true?
  - (1) Spotted came in first
  - (2) Red finished last
  - (3) Grey came in last
  - (4) Grey came in first
  - (5) Black or Red came in last

16. Suppose, in addition, it is known that Red came in last. Then which of the following must be true?
  - (1) Spotted came in first or Second
  - (2) White finished 3<sup>rd</sup> or 4<sup>th</sup>.
  - (3) Grey came in last or 4<sup>th</sup>
  - (4) Grey came in first or second
  - (5) White finished 3<sup>rd</sup> or 2<sup>th</sup>

Overall LR Strategy		
Correct	Percentile	Time / set
4	90	30
8	99	15
12	99.9	10
16	99.9	7.5

## Solutions

Let the bold letters denote the teams that have lost. From condition 3 of stage I, D lost to A. D won against C. D won against F. These can be represented as: **D** – A **D** -- C **D** -- F Similarly, condition 4 of stage I can be represented as: E -- **B** E -- **C** E -- **F** Since D and E have participated in three matches in stage I, they would not be involved in any other match in stage I. From the above representations it is clear that all other teams except A have lost at least one match. From condition 1, of stage I, only A has won all the three matches in stage I. Also, A will participate in 2 more matches as every team participates in 3 matches in stage I. A will win in 2 of the remaining 3 matches. Also A is the top team as it wins all matches in stage I. From condition 6 of stage I, F did not play against A. A won against B and C which can be represented as: **B** -- A **A** -- **C** The only 2 teams which have not won even a single match so far is C and F. From statement 6 of stage I, F loses in the remaining match against B, which can be represented as: **F** -- **B** Stage I can be represented as: **D** -- A **B** -- A **D** -- C **A** -- C **D** -- **F** **F** -- **B** E -- **B** E -- **C** E -- **F** From condition 1 of stage II, A lost both matches in stage II. Also, since no team plays against the same team more than once in the event, A plays matches against E and F. **A** -- E **A** -- **F** Since one of the two teams at the bottom after stage I won both matches in stage II, F is the team which has won both the matches in stage II. Also C lost both matches in stage II. **F** -- C **B** -- **C** The last condition states that one more team lost both matches in stage II. **D** lost both matches in stage II. **D** -- **B** **D** -- **E** Stage II can be represented as: **A** -- E **A** -- **F** **F** -- C **B** -- C **D** -- **B** **D** -- **E** Now, we can calculate the number of times each team has won.

Team	Stage I	Stage II	Total
<b>A</b>	3	0	3
<b>B</b>	2	2	4
<b>C</b>	0	0	0
<b>D</b>	2	0	2
<b>E</b>	2	2	4
<b>F</b>	0	2	2

1. E and F defeated A. Hence, option 2.
2. B, E and F are the three teams that won both matches in stage II. Hence, option 4.
3. From the table it is clear that the teams that won exactly two matches in the event are D and F. Hence, option 5.
4. It can be observed from the above table that B and E have most wins in the event. Hence, option 5.

5. (5) 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 =  $8200 - 500 = 7700$ . We cannot say for sure who would have higher returns. Hence, option 5.

6. (5) 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.

7. (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. 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. Hence, option 1.

8. (1) On a bear day, Abdul's return < Chetan's return < Bikram's return. Hence, option 1.

P (White, 4th)                      R (Yellow, 5th)  
 U (Orange, Shortest)          Q (Green, 2nd/3rd)  
 S (Red, 2nd/3rd)                T (Blue, First tallest)

9. The colour of the tallest house (T) is Blue.

10. The house diagonally opposite to the Yellow coloured house is S which has red colour.

11. The second tallest house can be either S or Q. We cannot determine for sure which of them is the second tallest. hence type S or Q.

12. UR is the odd combination. So type 4.

Win x4	2nd x3	3rd x1	4th x0	5th x0
	White 2000		Red 3000	Black 1000
	White 2000		Black 1000	Red 3000
Black 1000		White 2000	Red 3000	
Black 1000		White 2000		Red 3000
	Black 1000	Red 3000	White 2000	
	Black 1000	Red 3000		White 2000

13. We solve this question by options. If we consider option 4 to be true, then either the White or Red horse will finish first. It means that the amount Raju receives at the end of the race will be at least Rs. 8000 or Rs. 12000 (depending on which of the two horses finish first). However, his investment at the start of the race was only Rs. 6000. So, his profit could never be zero; in the worst scenario he will at least make Rs. 2000. Option (4) cannot be true. Hence, option 4.

14. We solve this question by options. If we consider option 3 to be true, then White finishes second and one of the Red or Black horses will come in the first or third positions. With White at the second position, the amount Raju receives at the end of the race will be at least Rs. 6000, and from Red or Black he will earn some money. Therefore, the total money Raju receives will be more than Rs. 6000. Since his investment at the start of the race was only Rs. 6000, his profit could never be zero. Option (3) cannot be true. Hence, option 3.

15. Grey came in last

16. White finished 3<sup>rd</sup> or 2<sup>th</sup>

16.