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CAT 2007

1. Suppose you have a currency, named Miso, in three denominations: 1 Miso, 10 Misos and 50 Misos. In how many ways can you pay a bill of 107 Misos?

   (a) 17 (b) 16

   (c) 18 (d) 15

   (e) 19

2. A confused bank teller transposed the rupees and paise when he cashed a cheque for Shailaja, giving her rupees instead of paise and paise instead of rupees. After buying a toffee for 50 paise, Shailaja noticed that she was left with exactly three times as much as the amount on the cheque. Which of the following is a valid statement about the cheque amount?

   (a) Over Rupees 13 but less than Rupees 14

   (b) Over Rupees 7 but less than Rupees 8

   (c) Over Rupees 22 but less than Rupees 23

   (d) Over Rupees 18 but less than Rupees 19

   (e) Over Rupees 4 but less than Rupees 5

Directions for Questions 3 and 4: Shabnam is considering three alternatives to invest her surplus cash for a week. She wishes to guarantee maximum returns on her investment. She has three options, each of which can be utilised fully or partially in conjunction with others.

Option A: Invest in a public sector bank. It promises a return of +0.10%.

Option B: Invest in mutual funds of ABC Ltd. A rise in the stock market will result in a return of +5%, while a fall will entail a return of –3%.

Option C: Invest in mutual funds of CBA Ltd. A rise in the stock market will result in a return of -2.5%, while a fall will entail a return of +2%.

3. The maximum guaranteed return to Shabnam is

(a) 0.25%
(b) 0.10%
(c) 0.20%
(d) 0.15%
(e) 0.30%

4. What strategy will maximise the guaranteed return to Shabnam?
   (a) 100% in option A
   (b) 36% in option B and 64% in option C
   (c) 64% in option B and 36% in option C
   (d) 1/3rd in each of the three options
   (e) 30% in option A, 32% in option B and 38% in option.

Directions for Questions 5–8: Each question is followed by two statements, A and B. Answer each question using the following instructions:

Mark (a) if the question can be answered by using statement A alone but not by using statement B alone.

Mark (b) if the question can be answered by using statement B alone but not by using statement A alone.

Mark (c) if the question can be answered by using either of the statements alone.

Mark (d) if the question can be answered by using both the statements together but not by either of the statements alone.

Mark (e) if the question cannot be answered on the basis of the two statements.

5. In a particular school, sixty students were athletes. Ten among them were also among the top academic performers. How many top academic performers were in the school?
   A. Sixty per cent of the top academic performers were not athletes.
   B. All the top academic performers were not necessarily athletes.
6. Five students Atul, Bala, Chetan, Dev and Ernesto were the only ones who participated in a quiz contest. They were ranked based on their scores in the contest. Dev got a higher rank as compared to Ernesto, while Bala got a higher rank as compared to Chetan. Chetan's rank was lower than the median. Who among the five got the highest rank?
   A. Atul was the last rank holder.
   B. Bala was not among the top two rank holders.
7. Thirty per cent of the employees of a call centre are males. Ten per cent of the female employees have an engineering background. What is the percentage of male employees with engineering background?
   A. Twenty five per cent of the employees have engineering background.
   B. Number of male employees having an engineering background is 20% more than the number of female employees having an engineering background.
8. In a football match, at half-time, Mahindra and Mahindra Club was trailing by three goals Did it win the match?

A. In the second-half Mahindra and Mahindra Club scored four goals.

B. The opponent scored four goals in the match.

Directions for Questions 9–13: Answer the following questions based on the information given below:

A low-cost airline company connects ten Indian cities, A to J. The table below gives the distance between a pair of airports and the corresponding price charged by the company. Travel is permitted only from a departure airport to an arrival airport. The customers do not travel by a route where they have to stop at more than two intermediate airports.

Sector No.	Airport of Departure	Airport of Arrival	Distance between the Airports (km)	Price (`)
1	A	B	560	670
2	A	C	790	1350
3	A	D	850	1250
4	A	E	1245	1600
5	A	F	1345	1700
6	A	G	1350	2450
7	A	H	1950	1850
8	B	C	1650	2000
9	B	H	1750	1900
10	B	I	2100	2450
11	B	J	2300	2275
12	C	D	460	450
13	C	F	410	430
14	C	G	910	1100
15	D	E	540	590
16	D	F	625	700
17	D	G	640	750
18	D	H	950	1250
19	D	J	1650	2450
20	E	F	1250	1700
21	E	G	970	1150

22	E	H	850	875
23	F	G	900	1050
24	F	I	875	950
25	F	J	970	1150
26	G	I	510	550
27	G	J	830	890
28	H	I	790	970
29	H	J	400	425
30	I	J	460	540

9. What is the lowest price, in rupees, a passenger has to pay for travelling by the shortest route from A to J?

   (a) 2275 (b) 2850

   (c) 2890 (d) 2930

   (e) 3340

10. The company plans to introduce a direct flight between A and J. The market research results indicate that all its existing passengers travelling between A and J will use this direct flight if it is priced 5% below the minimum price that they pay at present. What should the company charge approximately, in rupees, for this direct flight?

    (a) 1991 (b) 2161

    (c) 2707 (d) 2745

    (e) 2783

11. If the airports C, D and H are closed down owing to security reasons, what would be the minimum price, in rupees, to be paid by a passenger travelling from A to J?

    (a) 2275 (b) 2615

    (c) 2850 (d) 2945

    (e) 3190

12. If the prices include a margin of 10% over the total cost that the company incurs, what is the minimum cost per kilometer that the company incurs in flying from A to J?

    (a) 0.77 (b) 0.88

    (c) 0.99 (d) 1.06

    (e) 1.08

13. If the prices include a margin of 15% over the total cost that the company incurs, which among the following is the distance to be covered in flying from A to J that minimises the total cost

per kilometer for the company?

(a) 2170 (b) 2180

(c) 2315 (d) 2350

(e) 2390

Directions for Questions 14–16: Each of the following questions has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way.

14. Characters are also part of deep structure. Characters tie events in a story together and provide a thread of continuity and meaning. Stories can be about individuals, groups, projects, or whole organisations, so from an organisational studies perspective, the focal actor(s) determine the level and unit of analysis used in a study. Stories of mergers and acquisitions, for example, are commonplace. In these stories whole organisations are personified as actors. But these macro-level stories usually are not told from the perspective of the macro-level participants, because whole organisations cannot narrate their experiences in the first person.

    (a) More generally, data concerning the identities and relationships of the characters in the story are required, if one is to understand role structure and social networks in, which that process is embedded.

    (b) Personification of a whole organisation abstracts away from the particular actors and from traditional notions of level of analysis.

    (c) The personification of a whole organisation is important because stories differ depending on who is enacting various events.

    (d) Every story is told from a particular point of view, with a particular narrative voice, which is not regarded as part of the deep structure.

    (e) The personification of a whole organisation is a textual device we use to make macro-level theories more comprehensible.

15. Nevertheless, photographs still retain some of the magical allure that the earliest daguerreotypes inspired. As objects, our photographs have changed; they have become physically flimsier as they have become more technologically sophisticated. Daguerre produced pictures on copper plates; today many of our photographs never become tangible things, but instead remain filed away on computers and cameras, part of the digital ether that envelops the modern world. At the same time, our patience for the creation of images has also eroded. Children today are used to being tracked from birth by digital cameras and video recorders and they expect to see the results of their poses and performances instantly. The space between life as it is being lived and life as it is being displayed shrinks to a mere second.

    (a) Yet, despite these technical developments, photographs still remain powerful because they are reminders of the people and things we care about.

    (b) Images, after all, are surrogates carried into battle by a soldier or by a traveller on holiday.

    (c) Photographs, be they digital or traditional, exist to remind us of the absent, the beloved,

and the dead.

(d) In the new era of the digital image, the images also have a greater potential for fostering falsehood and trickery, perpetuating fictions that seem so real we cannot tell the difference.

(e) Anyway, human nature being what it is, little time has passed after photography's invention became means of living life through images.

16. Mma Ramotswe had a detective agency in Africa, at the foot of Kgale Hill. These were its assets: a tiny white van, two desks, two chairs, a telephone, and an old typewriter. Then there was a teapot, in which Mma Ramotswe – the only private lady detective in Botswana – brewed red bush tea. And three mugs – one for herself, one for her secretary, and one for the client. What else does a detective agency really need? Detective agencies rely on human intuition and intelligence, both of which Mma Ramotswe had in abundance.

(a) But there was also the view, which again would appear on no inventory.

(b) No inventory would ever include those, of course.

(c) She had an intelligent secretary too.

(d) She was a good detective and a good woman.

(e) What she lacked in possessions was more than made up by a natural shrewdness.

Answer Key

1. (c)	2. (d)	3. (c)	4. (b)
5. (a)	6. (d)	7. (c)	8. (e)
9. (d)	10. (b)	11. (c)	12. (b)
13. (d)	14. (e)	15. (a)	16. (b)

Solutions:

1. **Thought Process:**

Deduction 1: If you were to use 2, 50 miso notes, you can only pay the remaining 7 misos through 1 miso notes.

Deduction 2: If you were to use only 1, 50 miso note, you could use 10 miso notes in 6 different ways (from 0 to 5).

Deduction 3: If you were to use no 50 miso notes, you could use 10 miso notes in 11 different ways (from 0 to 10).

Hence, the required answer is $1 + 6 + 11 = 18$.

Maximum solution time: 45 seconds.

2. **Thought Process:**

Question Interpretation: The solution language for this question, requires you to think about what possible amount could be such that when it's rupees and paise value are interchanged,

the resultant value is 50 paise more than thrice the original amount.

Option checking process:

Armed with this logic, suppose we were to check for option (a) i.e. The value is above ` 22 but below ` 23. This essentially means that the amount must be approximately between ` 22.66 to ` 22.69. (We get the paise amount to be between 66 to 69 based on the fact that the relationship between the Actual Amount, x and the transposed amount y is: $y - 50$ paise $= 3x$. Hence, values below 22.66 and values above 22.70 are not possible.

Æ From this point onwards we just have to check whether this relationship is satisfied by any of the values between ` 22.66 to ` 22.69.

Æ Also, realise the fact that in each of these cases the paise value in the value of the transposed amount y would be 22. Thus, $3x$ should give us the paise value as 72. (since we have to subtract 50 paise from the value of 'y' in order to get the value of $3x$).

Æ This also means that the unit digit of the paise value of $3x$ should be 2.

Æ It can be clearly seen that none of the numbers 66, 67, 68 or 69 when multiplied by 3 give us a units digit of 2. Hence, this is not a possible answer.

Checking for option (d) in the same fashion:

You should realise that the outer limit for the range of values when the amount is between 18 and 19 is: 18.54 to 18.57. Also, the number of paise in the value of the transposed sum 'y' would be 18. Hence, the value of $3x$ should give us a paise value as 68 paise. Again, using the units digit principle, it is clear that the only value where the units digit would be 8 would be for a value of 18.56.

Hence, we check for the cheque amount to be 18.56. Transposition of the Rupee and paise value would give us 56.18. When you subtract 50 paise from this you would get 55.68 which also happens to be thrice 18.56. Hence, the correct answer is Option (d).

Notice here that if you can work out this logic in your reactions, the time required to check each option would be not more than 30 seconds. Hence, the net problem solving time to get the second option as correct would not be more than 1 minute. Add the reading time and this problem should still not require more than 2 minutes.

Solutions to Questions 3 and 4:

To solve this question, proceed from Question 4.

Note: This is a very common structure used in the CAT (and we just saw it in the previous question), where you have a set of 2 questions and starting from the second has a lot of advantages.

Question 4 asks us to identify the investment scheme that would give us the maximum value of the minimum guaranteed return. For this purpose we need to see the minimum return which each investment ratio is giving us and compare this across different options. **Note:** The minimum guaranteed return would be the least return to be expected in the worst case scenario for a particular investment ratio.

Although the amount of working in this question might seem to be high, you should realise that the value of the minimum guaranteed return which we would discover through this question would also answer the previous question for us. Thus, we are playing for 8 marks when we are solving this

question. The following thought process ensues:

(1) 100% in option A—Return 0.1%

(2) 36% in option B and 64% in option C—

If stock market rises:

Return = 0.05 ¥ 36 – 0.025 ¥ 64 = 36/20 – 64/40 = 1.8 – 1.6 = 0.2%

If stock market falls:

Return = –0.03 ¥ 36 + 0.02 ¥ 64 = 1.28 – 1.08 = 0.2%

Thus in both cases the minimum guaranteed return is 0.2% for this option. (The lower value has to be taken.)

(3) 64% in option B and 36% in option C

If stock market rises:

Return = 0.05 ¥ 64 – 0.025 ¥ 36 = 64/20 – 36/40 = 3.2 – 0.9 = 2.3%

If stock market falls:

Return = –0.03 ¥ 64 + 0.02 ¥ 36 = 0.72 – 1.92 = –1.2%

Thus for this case, the minimum guaranteed return is negative at –1.2%.

(4) 1/3 in each of the three options

If stock market rises:

Return = 0.05 ¥ 33.33 + 0.001 ¥ 33.33 – 0.025 ¥ 33.33 = The return is less than 0.2% (can be seen without calculating—with a little bit of weighted average thinking.) Since this value is less than 0.2% even if the next value were higher than 0.2% it would not raise the minimum guaranteed return in this case to over 0.2%. Hence, this option will not give the maximum value of the minimum guaranteed return.

(5) 30% in option A, 32% in option B and 38% in option C

If stock market rises:

Return = 0.001 ¥ 30 + 0.05 ¥ 32 – 0.025 ¥ 38 = 0.03 + 1.6 – 0.95 = 0.68

If stock market falls:

Return = 0.001 ¥ 30 – 0.03 ¥ 32 + 0.02 ¥ 38 = 0.03 + 0.76 – 0.96 = negative return

Thus option (b) is the correct answer.

From Q.4 we also get the answer to question 3 as the value of the minimum guaranteed return is 0.2% (as seen in option (b) of Question 4).

5. In a particular school, sixty students were athletes. Ten among them were also among the top academic performers. How many top academic performers were in the school?

A. Sixty per cent of the top academic performers were not athletes.

Reaction: Since 60% of the top academic performers were not athletes, it means that 40% were athletes. We also know that this number was 10. Thus we can find the number of top academic performers as (athletes + non-athletes. Thus A alone is sufficient.)

B. All the top academic performers were not necessarily athletes.

Reaction: We cannot solve this only on the basis of statement B as it gives no additional

info to find the number of top academic performers. Thus we mark option (a) as the correct answer.

6. Five students Atul, Bala, Chetan, Dev and Ernesto were the only ones who participated in a quiz contest. They were ranked based on their scores in the contest. Dev got a higher rank as compared to Ernesto, **(Reaction: Dev > Ernesto)** while Bala got a higher rank as compared to Chetan **(Reaction: Bala > Chetan)**. Chetan's rank was lower than the median (**(Reaction: Chetan was 4th or 5th)**. Who among the five got the highest rank?

   A. Atul was the last rank holder.

   Reaction: This means that Chetan was fourth. Then the first three ranks can be divided amongst Bala, Dev and Ernesto with the condition that Dev was greater than Ernesto However, this gives us the following possibilities B > D > E > C > A or D > B > E > C > A or even D > E > B > C > A. If you look at what is possible both B and D can come first, which means that we cannot uniquely answer the question on the basis of statement A alone.

   B. Bala was not among the top two rank holders.

   Reaction: Alone this means nothing as it gives multiple possibilities for the first rank—as either Atul or Dev can get the first rank in this case.

   When we use both statements however, if we were to apply this bit of information to the deductions we got from statement A, it is evident that Bala cannot be amongst the first two. Based on this, on the three possibilities available in the analysis of statement A, it is clear that only D > E > B > C > A remains. Thus, Dev becomes the topper in this case and we get it when we use both the statements.

   We mark Option (d) as the correct answer.

7. Thirty per cent of the employees of a call centre are males. Ten per cent of the female employees have an engineering background. **(Reaction: 7% of the total are female and engineers).** What is the percentage of male employees with engineering background?

   A. Twenty five per cent of the employees have engineering background.

   (**Reaction:** Since we know that of the total there are 7% female engineers, there must be 18% male engineers out of total 30% males. This means that 18/30 = 60% of the males are engineers. Thus statement A alone is sufficient.

   B. Number of male employees having an engineering background is 20% more than the number of female employees having an engineering background.

   Reaction: This means that out of 100, if there are 7 people who are females and engineers, then there must be 8.4 who are male and engineers. Thus, out of 30 male employees there are 8.4 who are engineers. This gives us a unique answer to the question asked and hence statement B alone is also sufficient.

   Since the question can be answered by either statement A or statement B, we mark option (c) as the answer.

8. In a football match, at the half-time, Mahindra and Mahindra Club was trailing by three goals Did it win the match?

   A. In the second-half Mahindra and Mahindra Club scored four goals. (**Reaction:** Whether

they won or not cannot be answered as it also depends on how many goals the opponent scored in the second half.)

B. The opponent scored four goals in the match.

Reaction: Obviously by itself statement B gives no answer.

We now consider both statements together. There can be two scenarios here: If the first half score was 3-0 against Mahindra and Mahindra, then the match would end in a 4-4 draw. So the answer to the question asked 'did it win the match' in this case is 'no'. On the other hand if the first half score was 4-1 then Mahindra and Mahindra would win 5-4. The answer to the question asked is now 'yes'. Thus we don't have definite conclusion about whether Mahindra and Mahindra won the match. Hence, we mark option (e) as the correct answer.

Solutions for Questions 9–13:

Reaction: This type of question only requires a calm and concentrated mind to solve because the questions are solved by interpreting the table and using basic addition and subtraction skills.

The first reaction while looking at the table should be to create a table with different routes, distances and prices from city A to city J keeping in mind that the customer does not travel by a route that has more than two intermediate airports. For example, Route A Æ B Æ J: the total distance is (560 + 2300 = 2860) and price is (670 + 2275 = 2945). Similarly, all routes can be tabulated as:

Route	Distance (km)	Price (Rs)
ABJ	2860	2945
ABHJ	2710	2995
ABIJ	3120	3660
ACDJ	2900	4250
ACFJ	2170	2930
ACGJ	2530	3340
ADJ	2500	3700
ADFJ	2445	3100
ADGJ	2320	3290
ADHJ	2200	2925
AEFJ	3465	4450
AEGJ	3045	3640
AEHJ	2495	2900

AFJ	2315	2850
AFGJ	3075	3640
AFIJ	2680	3190
AGJ	2180	3340
AGIJ	2320	3540
AHJ	2350	2275
AHIJ	3200	3360

After the table is created the solution to every question can be derived in minimum time and maximum accuracy.

9. The shortest route for A Æ J is clearly A Æ C Æ F Æ J, with a total distance of 2170. And the price of travel is ` 2930. Hence, correct option choice is option (d).
10. The lowest price for A Æ J is ` 2275 in route A Æ H Æ J. Hence calculating 5% decrease on the lowest price gives us the answer of 2161 approx. Hence the correct option is option (b).
11. If airports C, D and H are shutdown then the minimum price paid by the passenger will be on route A Æ F Æ J which is ` 2850. Hence correct option is option (c).
12. The 2350 distance has the minimum price of all routes so calculating the cost for this option gives the minimum cost per kilometre for the company. Hence option (b) is correct.
13. The solution can be given by calculating the margin of 15% and deducting it from the price to calculate the total cost. Look at the options, option (d) 2350 has the minimum price of all routes so calculating the cost we get option (d) as the correct choice.
14. In the last line of the paragraph the writer is discussing organisation and macro level players and we have to carry the idea forward. He has just stated the limitation of the personification of organisations—that they cannot narrate their experience in the first person. So the concluding statement has to conclude the idea of the usefulness of personification of organisations. Options (e) complete the paragraph in the best manner by defining the personification of a whole organisation as a textual device. Hence, option (e) is the correct answer.
15. In the first line of the paragraph, the writer gives a conclusion. So option (a) is the correct answer.

    Then he discusses various changes in technology, only to reaffirm the conclusion in the last line. Options (b) and (c) can be attached to the paragraph's idea. Option (d) introduces a new line of thinking about falsehood and trickery and option (e) is irrelevant.

    Hence, option (a) is the correct answer.
16. Option (b) is the best conclusion as the whole paragraph talks about inventories. Hence, option (b) is the correct answer.