Analytical Reasoning

**Total Time: 150 mins**

**Previous Years CAT Questions**

**Total no. Of Qs: 44**

**CAT 2001**

**Directions for questions 1 to 3:** Answer the questions based on the pipeline diagram below.
The following sketch shows the pipelines carrying material from one location to another. Each location has a demand for material. The demand at Vaishali is 400, at Jyotishmati is 400, at Panchal is 700, and at Vidisha is 200. Each arrow indicates the direction of material flow through the pipeline. The flow from Vaishali to Jyotishmati is 300. The quantity of material flow is such that the demands at all these locations are exactly met. The capacity of each pipeline is 1,000.

![Pipeline Diagram]

1. The quantity moved from Avanti to Vidisha is
   a. 200  
   b. 800  
   c. 700  
   d. 1,000

2. The free capacity available at the Avanti-Vaishali pipeline is
   a. 0  
   b. 100  
   c. 200  
   d. 300

3. What is the free capacity available in the Avanti-Vidisha pipeline?
   a. 300  
   b. 200  
   c. 100  
   d. 0

4. Mrs Ranga has three children and has difficulty remembering their ages and months of their birth. The clue below may help her remember.
   - The boy, who was born in June, is 7 years old.
   - One of the children is 4 years old but it was not Anshuman.
   - Vaibhav is older than Suprita.
   - One of the children was born in September, but it was not Vaibhav.
   - Suprita’s birthday is in April.
   - The youngest child is only 2-year-old

   Based on the above clues, which one of the following statements is true?
   a. Vaibhav is the oldest, followed by Anshuman who was born in September, and the youngest is Suprita who was born in April

b. Anshuman is the oldest being born in June, followed by Suprita who is 4-year-old, and the youngest is Vaibhav who is 2-year-old

c. Vaibhav is the oldest being 7-year-old, followed by Suprita who was born in April, and the youngest is Anshuman who was born in September

d. Suprita is the oldest who was born in April, followed by Vaibhav who was born in June, and Anshuman who was born in September

5. The Bannerjees, the Sharmas, and the Pattabhiramans each have a tradition of eating Sunday lunch as a family. Each family serves a special meal at a certain time of day. Each family has a particular set of chinaware used for this meal. Use the clues below to answer the following question.
   - The Sharma family eats at noon.
   - The family that serves fried brinjal uses blue chinaware.
   - The Bannerjee family eats at 2 o’clock.
   - The family that serves sambar does not use red chinaware.
   - The family that eats at 1 o’clock serves fried brinjal.
   - The Pattabhiraman family does not use white chinaware.
   - The family that eats last likes makkai-ki-roti.

   Which one of the following statements is true?
   a. The Bannerjees eat makkai-ki-roti at 2 o’clock, the Sharmas eat fried brinjal at 12 o’clock and the Pattabhiramans eat sambar from red chinaware
   b. The Sharmas eat sambar served in white chinaware, the Pattabhiramans eat fried brinjal at 12 o’clock and the Sharmas eat makkai-ki-roti served in blue chinaware
   c. The Sharmas eat sambar at noon, the Pattabhiramans eat fried brinjal served in blue chinaware, and the Bannerjees eat makkai-ki-roti served in red chinaware
   d. The Bannerjees eat makkai-ki-roti served in white chinaware, the Sharmas eat fried brinjal at 12 o’clock and the Pattabhiramans eat sambar from red chinaware

6. While Balbir had his back turned, a dog ran into his butcher shop, snatched a piece of meat off the counter
and ran out. Balbir was mad when he realised what had happened. He asked three other shopkeepers, who had seen the dog, to describe it. The shopkeepers really did not want to help Balbir. So each of them made a statement which contained one truth and one lie.

- Shopkeeper number 1 said: “The dog had black hair and a long tail.”
- Shopkeeper number 2 said: “The dog had a short tail and wore a collar.”
- Shopkeeper number 3 said: “The dog had white hair and no collar.”

Based on the above statements, which of the following could be a correct description?

a. The dog had white hair, short tail and no collar  
b. The dog had white hair, long tail and a collar  
c. The dog had black hair, long tail and a collar  
d. The dog had black hair, long tail and no collar

7. On her walk through the park, Hamsa collected 50 coloured leaves, all either maple or oak. She sorted them by category when she got home, and found the following:

- The number of red oak leaves with spots is even and positive.
- The number of red oak leaves without any spot equals the number of red maple leaves without spots.
- All non-red oak leaves have spots, and there are five times as many of them as there are red spotted oak leaves.
- There are no spotted maple leaves that are not red.
- There are exactly 6 red spotted maple leaves.
- There are exactly 22 maple leaves that are neither spotted nor red.

How many oak leaves did she collect?

a. 22    b. 17    c. 25    d. 18

8. Eight people carrying food baskets are going for a picnic on motorcycles. Their names are A, B, C, D, E, F, G, and H. They have 4 motorcycles M1, M2, M3 and M4 among them. They also have 4 food baskets O, P, Q and R of different sizes and shapes and each can be carried only on motorcycles M1, M2, M3 and M4 respectively. No more than 2 persons can travel on a motorcycle and no more than one basket can be carried on a motorcycle. There are 2 husband-wife pairs in this group of 8 people and each pair will ride on a motorcycle together. C cannot travel with A or B. E cannot travel with B or F. G cannot travel with F, or H, or D. The husband-wife pairs must carry baskets O and P. Q is with A and P is with D. F travels on M1 and E travels on M2 motorcycles. G is with Q, and B cannot go with R. Who is travelling with H?

\[ \begin{array}{ll}
\text{a. A} & \text{b. B} \\
\text{c. C} & \text{d. D}
\end{array} \]

9. In a family gathering there are 2 males who are grandfathers and 4 males who are fathers. In the same gathering there are 2 females who are grandmothers and 4 females who are mothers. There is at least one grandson or a granddaughter present in this gathering. There are 2 husband-wife pairs in this group. These can either be a grandfather and a grandmother, or a father and a mother. The single grandfather (whose wife is not present) has 2 grandsons and a son present. The single grandmother (whose husband is not present) has 2 granddaughters and a daughter present. A grandfather or a grandmother present with their spouses does not have any grandson or granddaughter present.

What is the minimum number of people present in this gathering?

a. 10    b. 12    c. 14    d. 16

Directions for questions 10 and 11: Answer the questions based on the following information. A and B are two sets (e.g. A = Mothers, B = Women). The elements that could belong to both the sets (e.g. women who are mothers) is given by the set C = A \* B. The elements which could belong to either A or B, or both, is indicated by the set D = A \* B \* . A set that does not contain any elements is known as a null set represented by \[ \square \] (e.g. if none of the women in the set B is a mother, then C = A \* B is a null set, or C = \[ \square \] ). Let ‘V’ signify the set of all vertebrates, ‘M’ the set of all mammals, ‘D’ dogs, ‘F’ fish, ‘A’ alsatian and ‘P’, a dog named Pluto.

10. Given that X = M \* D is such that X = D. Which of the following is true?

a. All dogs are mammals  
b. Some dogs are mammals  
c. X = \[ \square \]  
d. All mammals are dogs

11. If Z = (P \* D) \* M, then

a. the elements of Z consist of Pluto, the dog, or any other mammal  
b. Z implies any dog or mammal  
c. Z implies Pluto or any dog that is a mammal
12. In a hospital there were 200 diabetes, 150 hyperglycaemia and 150 gastro-enteritis patients. Of these, 80 patients were treated for both diabetes and hyperglycaemia. Sixty patients were treated for gastro-enteritis and hyperglycaemia, while 70 were treated for diabetes and gastroenteritis. Some of these patients have all the three diseases. Dr. Dennis treats patients with only gastro-enteritis. Dr. Paul is a generalist. Therefore, he can treat patients with multiple diseases. Patients always prefer a specialist for their disease. If Dr. Dennis had 80 patients, then the other three doctors can be arranged in terms of the number of patients treated as:

1. Paul > Gerard > Hormis
2. Paul > Hormis > Gerard
3. Gerard > Paul > Hormis
4. None of these

13. Two boys are playing on a ground. Both the boys are less than 10 years old. Age of the younger boy is equal to the cube root of the product of the age of the two boys. If we place the digit representing the age of the younger boy to the left of the digit representing the age of the elder boy, we get the age of father of the younger boy. Similarly, if we place the digit representing the age of the elder boy to the left of the digit representing the age of the younger boy and divide the figure by 2, we get the age of mother of the younger boy. The mother of the younger boy is younger to his father by 3 years. Then, what is the age of the younger boy?

1. 3
2. 4
3. 2
4. None of these

14. Flights A and B are scheduled from an airport within the next one hour. All the booked passengers of the two flights are waiting in the boarding hall after check-in. The hall has a seating capacity of 200, out of which 10% remained vacant. 40% of the waiting passengers are ladies. When boarding announcement came, passengers of flight A left the hall and boarded the flight. Seating capacity of each flight is two-thirds of the passengers who waited in the hall for both the flights put together. Half the passengers who boarded flight A are women. After boarding for flight A, 60% of the waiting hall seats became empty. For every twenty of those who are still waiting in the hall for flight B, there is one air hostess in flight A. What is the ratio of empty seats in flight B to the number of air hostesses in flight A?
Five friends meet every morning at Sree Sagar restaurant for an idli-vada breakfast. Each consumes a different number of idlis and vadas. The number of idlis consumed are 1, 4, 5, 6, and 8, while the number of vadas consumed are 0, 1, 2, 4, and 6. Below are some more facts about who eats what and how much.

i. The number of vadas eaten by Ignesh is three times the number of vadas consumed by the person who eats four idlis.

iii. Sandeep does not take any chutney.

v. Daljit eats idli with chutney and also eats vada.

vii. Bimal eats two more idlis than Ignesh, but Ignesh eats two more vadas than Bimal.

18. Which one of the following statements is true?
1. Daljit eats 5 idlis
2. Ignesh eats 8 idlis
3. Bimal eats 1 idli.
4. Bimal eats 6 idlis.

19. Which of the following statements is true?
1. Sandeep eats 2 vadas.
2. Mukesh eats 4 vadas.
3. Ignesh eats 6 vadas.
4. Bimal eats 2 vadas.

20. Which of the following statements is true?
1. Mukesh eats 8 idlis and 4 vadas but no chutney.
2. The person who eats 5 idlis and 1 vada does not take chutney.
3. The person who eats equal number of vadas and idlis also takes chutney.
4. The person who eats 4 idlis and 2 vadas also takes chutney.

CAT 2003 (Re-Test)

Directions for questions 21 to 24: Answer the questions on the basis of the following table.

Below is a table that lists countries region-wise. Each region-wise list is sorted, first by birth rate and then alphabetically by name of country. We now wish to merge the region-wise list into one consolidated list and provide overall rankings to each country based first on birth rate and then on death rate. Thus, if some countries have the same birth rate, then the country with a lower death rate will be ranked higher. Further, countries having identical birth and death rates will get the same rank. For example, if two countries are tied for the third position, then both will be given rank 3, while the next country in the ordered list will be ranked 5.

21. In the consolidated list, what would be the overall rank of the Philippines?
1. 32
2. 33
3. 34
4. 35

22. In the consolidated list, how many countries would rank below Spain and above Taiwan?
1. 9
2. 8
3. 7
4. 6

23. In the consolidated list, which country ranks 37th?
1. South Africa
2. Brazil
3. Turkey
4. Venezuela

24. In the consolidated list, how many countries in Asia will rank lower than every country in South America, but higher than at least one country in Africa?
1. 8
2. 7
3. 6
4. 5

Directions for questions 25 to 29: Answer the questions on the basis of the following information.
Recently, the answers of a test held nationwide were leaked to a group of unscrupulous people. The investigative agency has arrested the mastermind and nine other people A, B, C, D, E, F, G, H and I in this matter. Interrogating them, the following facts have been obtained regarding their operation. Initially the mastermind obtains the correct answer-key. All the others create their answer-key in the following manner. They obtain the answer-key from one or two people who already possess the same. These people are called his/her ‘sources’. If the person has two sources, then he/she compares the answer-keys obtained from both sources. If the key to a question from both sources is identical, it is copied, otherwise it is left blank. If the person has only one source, he/she copies the source’s answers into his/her copy. Finally, each person compulsorily replaces one of the answers (not a blank one) with a wrong answer in his/her answer key. The paper contained 200 questions; so the investigative agency has ruled out the possibility of two or more of them introducing wrong answers to the same question. The investigative agency has a copy of the correct answer key and has tabulated the following data. These data represent question numbers.

<table>
<thead>
<tr>
<th>Name</th>
<th>Wrong Answer(s)</th>
<th>Blank Answer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>96</td>
<td>46, 90, 25</td>
</tr>
<tr>
<td>C</td>
<td>27, 56</td>
<td>17, 46, 90</td>
</tr>
<tr>
<td>D</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>46, 90</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>14, 46</td>
<td>92, 90</td>
</tr>
<tr>
<td>G</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>46, 92</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>27</td>
<td>17, 46, 90</td>
</tr>
</tbody>
</table>

25. Which one among the following must have two sources?

26. How many people (excluding the mastermind) needed to make answer-keys before C could make his answer-key?
   1. 2  2. 3  3. 4  4. 5

27. Both G and H were sources to
   1. F  2. B  3. I  4. None of the nine

28. Which of the following statements is true?
   1. C introduced the wrong answer to question 27.

29. Which of the following two groups of people had identical sources?
   I. A, D and G  II. E and H

CAT 2005
Directions for questions 30 to 33: Answer the questions on the basis of the information given below:
Venkat, a stockbroker, invested a part of his money in the stock of four companies — A, B, C and 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 returns were twice that of the initially expected returns. For the company belonging to the Steel or the Auto industry, there turns on 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.

30. What is the minimum average return Venkat would have earned during the year?
   (1) 30%  (2) 31\(\frac{1}{4}\)%  (3) 32\(\frac{1}{2}\)%  (4) Cannot be determined

31. 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.
32. If 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.

(1) I and II only  
(2) II and III only  
(3) III and IV only  
(4) II and IV only

33. 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. Company B did not announce extraordinarily good results.

(1) I and II only  
(2) II and III only  
(3) I and IV only  
(4) II and IV only

35. 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

Directions for Questions 36 to 39: 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.
- Two teams lost all the matches.
- D lost to A but won against C and F.
- E lost to B but won against C and F.
- B lost at least one match.
- 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.
- One more team lost both matches in Stage-II.

36. 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

37. 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

38. 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

34. Which of the following cannot be true?

1) At least two horses finished before Spotted
39. The team(s) with the most wins in the event is (are):
   (1) A  (2) A & C  (3) F  (4) E  (5) B & E

Directions for Questions 40 to 44: 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, 11 am, 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.

40. 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

41. 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

42. 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

43. Share price was at its highest at
   (1) 10 am  (2) 11 am  (3) 12 noon  (4) 1 pm  (5) Cannot be determined

44. Which of the following is necessarily false?
   1) Share price was at its lowest at 2 pm
   2) Share price was at its lowest at 11 am
   3) Share price at 1 pm was higher than the share price at 2 pm
   4) Share price at 1 pm was higher than the share price at 12 noon
   5) None of the above

One day, two other traders, Dane and Emily joined Abdul, Bikram and Chetan for trading in the shares of XYZ Ltd. Dane followed a strategy of buying equal numbers of shares at 10 am, 11 am and 12 noon, and selling the same numbers at 1 pm, 2 pm and 3 pm. Emily, on the other hand, followed the strategy of buying shares using all her money at 10 am and selling all of them at 12 noon and again buying the shares for all the money at 1 pm and again selling all of them at the close of the day at 3 pm. At the close of the day the following was observed.

i. Abdul lost money in the transactions.
ii. Both Dane and Emily made profits.
iii. There was an increase in share price during the closing hour compared to the price at 2 pm.
iv. Share price at 12 noon was lower than the opening price.