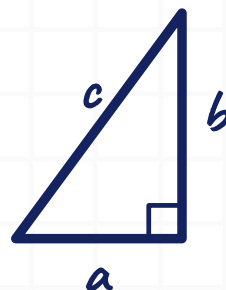
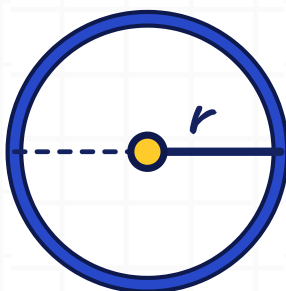


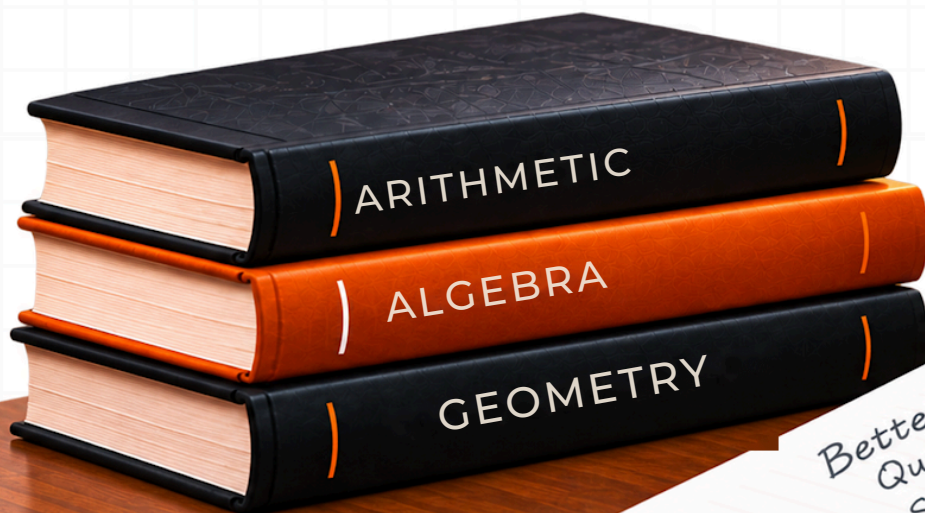
CAT PYQ

Modern Math

$$a^2 + b^2 = c^2$$



$$D = S \times T$$



Better
Questions
Stronger
Concepts
Brighter Future

87 Questions

Quantitative Aptitude

Years: 1990-2025

General Instructions

- (i) This collection contains **87 Quantitative Aptitude questions** classified under **Modern Math**, following the supplied CD PYQ sheet.
- (ii) **Coverage:** CAT 1990-2025. Questions are grouped by their source year and sitting, with continuous numbering from **1 to 87**.
- (iii) This collection has **73 multiple choice questions (MCQs)** and **14 Type In The Answer (TITA) questions**. Read every option before choosing the answer. Enter a response for questions marked "Type in the answer."
- (iv) All required shared passages and data sets for the selected questions are included. Blue range labels refer to the question numbers **in this collection**. Read the full passage, chart, table or conditions before answering.
- (v) Each question carries its original year or exam date, sitting where available, and source question number. References distinguish the two CAT 2003 sittings.
- (vi) Use this collection for practice. Follow the timing and marking scheme of the original sitting when attempting a timed exercise.
- (vii) Answer keys and solutions are not included. Passages and questions may continue onto the following page.

CAT 2025 Slot 1 - Questions 1-1

1. A cafeteria offers 5 types of sandwiches. Moreover, for each type of sandwich, a customer can choose one of 4 breads and opt for either small or large sized sandwich. Optionally, the customer may also add up to 2 out of 6 available sauces. The number of different ways in which an order can be placed for a sandwich, is

30 Nov 2025, Slot 1, Q58

(A) 880

(B) 840

(C) 800

(D) 600

2. In a class of 150 students, 75 students chose physics, 111 students chose mathematics and 40 students chose chemistry. All students chose at least one of the three subjects and at least one student chose all three subjects. The number of students who chose both physics and chemistry is equal to the number of students who chose both chemistry and mathematics, and this is half the number of students who chose both physics and mathematics. The maximum possible number of students who chose physics but not mathematics, is

30 Nov 2025, Slot 3, Q60

(A) 30

(B) 35

(C) 40

(D) 55

CAT 2024 Slot 1 - Questions 3-3

3. Consider two sets $A = \{2, 3, 5, 7, 11, 13\}$ and $B = \{1, 8, 27\}$. Let f be a function from A to B such that for every element in B , there is at least one element a in A such that $f(a) = b$. Then, the total number of such functions f is

24 Nov 2024, Slot 1, Q47

(A) 665

(B) 667

(C) 537

(D) 540

4. P, Q, R and S are four towns. One can travel between P and Q along 3 direct paths, between Q and S along 4 direct paths, and between P and R along 4 direct paths. There is no direct path between P and S, while there are few direct paths between Q and R, and between R and S. One can travel from P to S either via Q, or via R, or via Q followed by R, respectively, in exactly 62 possible ways. One can also travel from Q to R either directly, or via P or via S, in exactly 27 possible ways. Then, the number of direct paths between Q and R is

24 Nov 2024, Slot 2, Q65

Type in the answer.

CAT 2024 Slot 3 - Questions 5-5

5. In a group of 250 students, the percentage of girls was at least 44% and at most 60%. The rest of the students were boys. Each student opted for either swimming or running or both. If 50% of the boys and 80% of the girls opted for swimming while 70% of the boys and 60% of the girls opted for running, then the minimum and maximum possible number of students who opted for both swimming and running, are

24 Nov 2024, Slot 3, Q47

(A) 72 and 88, respectively

(B) 75 and 96, respectively

(C) 72 and 80, respectively

(D) 75 and 90, respectively

CAT 2023 Slot 1 - Questions 6-6

6. The number of all natural numbers up to 1000 with non-repeating digits is

26 Nov 2023, Slot 1, Q65

(A) 504

(B) 648

(C) 738

(D) 585

CAT 2022 Slot 1 - Questions 7-8

7. The number of ways of distributing 20 identical balloons among 4 children such that each child gets some balloons but no child gets an odd number of balloons, is

27 Nov 2022, Slot 1, Q54

Type in the answer.

8. In a class of 100 students, 73 like coffee, 80 like tea and 52 like lemonade. It may be possible that some students do not like any of these three drinks. Then the difference between the maximum and minimum possible number of students who like all the three drinks is

27 Nov 2022, Slot 1, Q61

(A) 47

(B) 53

(C) 52

(D) 48

CAT 2022 Slot 2 - Questions 9-9

9. The number of integers greater than 2000 that can be formed with the digits 0, 1, 2, 3, 4, 5, using each digit at most once, is

27 Nov 2022, Slot 2, Q58

(A) 1440

(B) 1200

(C) 1480

(D) 1420

CAT 2022 Slot 3 - Questions 10-10

10. The arithmetic mean of all the distinct numbers that can be obtained by rearranging the digits in 1421, including itself, is

27 Nov 2022, Slot 3, Q55

(A) 2222

(B) 2442

(C) 2592

(D) 3333

CAT 2021 Slot 1 - Questions 11-11

11. The number of groups of three or more distinct numbers that can be chosen from 1, 2, 3, 4, 5, 6, 7 and 8 so that the groups always include 3 and 5, while 7 and 8 are never included together is

28 Nov 2021, Slot 1, Q51

Type in the answer.

CAT 2021 Slot 2 - Questions 12-12

12. The number of ways of distributing 15 identical balloons, 6 identical pencils and 3 identical erasers among 3 children, such that each child gets at least four balloons and one pencil, is

28 Nov 2021, Slot 2, Q49

Type in the answer.

CAT 2021 Slot 3 - Questions 13-13

13. A four-digit number is formed by using only the digits 1, 2 and 3 such that both 2 and 3 appear at least once. The number of all such four-digit numbers is

28 Nov 2021, Slot 3, Q64

Type in the answer.

14. Students in a college have to choose at least two subjects from chemistry, mathematics and physics. The number of students choosing all three subjects is 18, choosing mathematics as one of their subjects is 23 and choosing physics as one of their subjects is 25. The smallest possible number of students who could choose chemistry as one of their subjects is

29 Nov 2020, Slot 2, Q61

- | | |
|--------|--------|
| (A) 22 | (B) 21 |
| (C) 20 | (D) 19 |
-

CAT 2019 Slot 1 - Questions 15-16

15. A club has 256 members of whom 144 can play football, 123 can play tennis, and 132 can play cricket. Moreover, 58 members can play both football and tennis, 25 can play both cricket and tennis, while 63 can play both football and cricket. If every member can play at least one game, then the number of members who can play only tennis is

24 Nov 2019, Slot 1, Q83

- (A) 38 (B) 32
(C) 45 (D) 43

16. With rectangular axes of coordinates, the number of paths from (1, 1) to (8, 10) via (4, 6), where each step from any point (x, y) is either to (x, y+1) or to (x+1, y), is

24 Nov 2019, Slot 1, Q97

Type in the answer.

CAT 2018 Slot 1 - Questions 17-19

17. How many numbers with two or more digits can be formed with the digits 1,2,3,4,5,6,7,8,9, so that in every such number, each digit is used at most once and the digits appear in the ascending order?

25 Nov 2018, Slot 1, Q81

Type in the answer.

18. Each of 74 students in a class studies at least one of the three subjects H, E and P. Ten students study all three subjects, while twenty study H and E, but not P. Every student who studies P also studies H or E or both. If the number of students studying H equals that studying E, then the number of students studying H is

25 Nov 2018, Slot 1, Q84

Type in the answer.

19. If among 200 students, 105 like pizza and 134 like burger, then the number of students who like only burger can possibly be

25 Nov 2018, Slot 1, Q86

(A) 23

(B) 26

(C) 96

(D) 93

CAT 2018 Slot 2 - Questions 20-21

20. For two sets A and B, let $A \Delta B$ denote the set of elements which belong to A or B but not both. If $P = \{1,2,3,4\}$, $Q = \{2,3,5,6\}$, $R = \{1,3,7,8,9\}$, $S = \{2,4,9,10\}$, then the number of elements in $(P \Delta Q) \Delta (R \Delta S)$ is

25 Nov 2018, Slot 2, Q73

Type in the answer.

21. In a tournament, there are 43 junior level and 51 senior level participants. Each pair of juniors play one match. Each pair of seniors play one match. There is no junior versus senior match. The number of girl versus girl matches in junior level is 153, while the number of boy versus boy matches in senior level is 276. The number of matches a boy plays against a girl is

25 Nov 2018, Slot 2, Q76

Type in the answer.

CAT 2017 Slot 1 - Questions 22-24

22. The number of solutions (x, y, z) to the equation $x - y - z = 25$, where x, y , and z are positive integers such that $x \leq 40, y \leq 12$, and $z \leq 12$ is

26 Nov 2017, Slot 1, Q91

- | | |
|---------|---------|
| (A) 101 | (B) 99 |
| (C) 87 | (D) 105 |
-

23. Let AB, CD, EF, GH, and JK be five diameters of a circle with center at O. In how many ways can three points be chosen out of A, B, C, D, E, F, G, H, J, K, and O so as to form a triangle?

26 Nov 2017, Slot 1, Q95

Type in the answer.

24. In how many ways can 7 identical erasers be distributed among 4 kids in such a way that each kid gets at least one eraser but nobody gets more than 3 erasers?

26 Nov 2017, Slot 1, Q98

- | | |
|--------|--------|
| (A) 16 | (B) 20 |
| (C) 14 | (D) 15 |
-

CAT 2017 Slot 2 - Questions 25-27

25. The numbers 1, 2, ..., 9 are arranged in a 3 X 3 square grid in such a way that each number occurs once and the entries along each column, each row, and each of the two diagonals add up to the same value. If the top left and the top right entries of the grid are 6 and 2, respectively, then the bottom middle entry is

26 Nov 2017, Slot 2, Q67

Type in the answer.

26. In how many ways can 8 identical pens be distributed among Amal, Bimal, and Kamal so that Amal gets at least 1 pen, Bimal gets at least 2 pens, and Kamal gets at least 3 pens?

26 Nov 2017, Slot 2, Q95

Type in the answer.

27. How many four digit numbers, which are divisible by 6, can be formed using the digits 0, 2, 3, 4, 6, such that no digit is used more than once and 0 does not occur in the left-most position?

26 Nov 2017, Slot 2, Q96

Type in the answer.

CAT 2008 - Questions 28-31

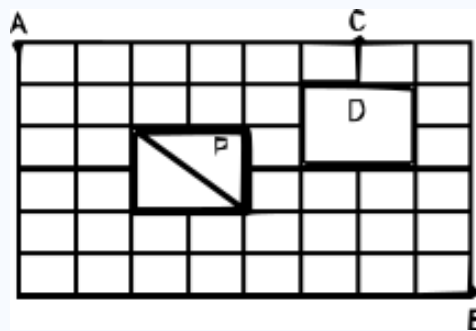
28. How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed?

16 Nov 2008, Q8

- | | |
|---------|---------|
| (A) 499 | (B) 500 |
| (C) 375 | (D) 376 |
| (E) 501 | |

Questions 29 to 30

Directions for the next two questions: The figure below shows the plan of a town. The streets are at right angles to each other. A rectangular park (P) is situated inside the town with a diagonal road running through it. There is also a prohibited region (D) in the town.



29. Neelam rides her bicycle from her house at A to her office at B, taking the shortest path. Then the number of possible shortest paths that she can choose is [CAT 2008]

16 Nov 2008, Q9

- | | |
|--------|--------|
| (A) 60 | (B) 75 |
| (C) 45 | (D) 90 |
| (E) 72 | |

30. Neelam rides her bicycle from her house at A to her club at C, via B taking the shortest path. Then the number of possible shortest paths that she can choose is [CAT 2008]

16 Nov 2008, Q10

- | | |
|----------|----------|
| (A) 1170 | (B) 630 |
| (C) 792 | (D) 1200 |
| (E) 936 | |

31. What is the number of distinct terms in the expansion of $(a + b + c)^{20}$?

16 Nov 2008, Q16

- | | |
|---------|---------|
| (A) 231 | (B) 253 |
| (C) 242 | (D) 210 |
| (E) 228 | |

32. 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?

18 Nov 2007, Q4

- (A) 17 (B) 16
(C) 18 (D) 15
(E) 19

33. In a tournament, there are n teams $T_1, T_2, \dots, T_n$ with $n > 5$. Each team consists of k players, $k > 3$. The following pairs of teams have one player in common: T_1 & T_2 , T_2 & T_3 , ..., T_{n-1} & T_n , and T_n & T_1 . No other pair of teams has any player in common. How many players are participating in the tournament, considering all the n teams together?

18 Nov 2007, Q17

- (A) $n(k - 1)$ (B) $k(n - 1)$
(C) $n(k - 2)$ (D) $k(n - 2)$
(E) $(n - 1)(k - 1)$

CAT 2006 - Questions 34-35

34. A survey was conducted of 100 people to find out whether they had read recent issues of Golmal, a monthly magazine. The summarized information regarding readership in 3 months is given below: Only September: 18; September but not August: 23; September and July: 8; September:28; July: 48; July and August: 10; none of the three months: 24 What is the number of surveyed people who have read exactly two consecutive issues (out of the three)?

19 Nov 2006, Q56

- | | |
|--------|--------|
| (A) 7 | (B) 9 |
| (C) 12 | (D) 14 |
| (E) 17 | |
-

35. There are 6 tasks and 6 persons. Task 1 cannot be assigned either to person 1 or to person 2; task 2 must be assigned to either person 3 or person 4. Every person is to be assigned one task. In how many ways can the assignment be done?

19 Nov 2006, Q69

- | | |
|---------|---------|
| (A) 144 | (B) 180 |
| (C) 192 | (D) 360 |
| (E) 716 | |
-

36. In a chess competition involving some boys and girls of a school, every student had to play exactly one game with every other student. It was found that in 45 games both the players were girls, and in 190 games both were boys. The number of games in which one player was a boy and the other was a girl is

20 Nov 2005, Q5

- | | |
|---------|---------|
| (A) 200 | (B) 216 |
| (C) 235 | (D) 256 |
-

37. Let S be the set of five-digit numbers formed by the digits 1, 2, 3, 4 and 5, using each digit exactly once such that exactly two odd positions are occupied by odd digits. What is the sum of the digits in the rightmost position of the numbers in S ?

20 Nov 2005, Q15

- | | |
|---------|---------|
| (A) 228 | (B) 216 |
| (C) 294 | (D) 192 |
-

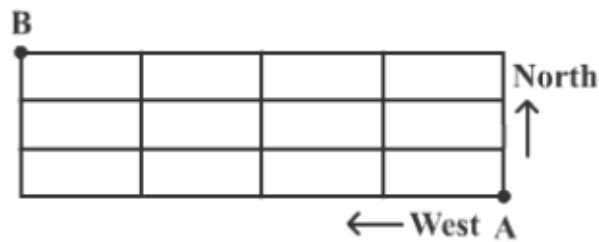
CAT 2004 - Questions 38-40

38. N persons stand on the circumference of a circle at distinct points. Each possible pair of persons, not standing next to each other, sings a two-minute song one pair after the other. If the total time taken for singing is 28 minutes, what is N ?

21 Nov 2004, Q50

- (A) 5 (B) 7
(C) 9 (D) None of the above

39. In the adjoining figure, the lines represent one-way roads allowing travel only northwards or only westwards. Along how many distinct routes can a car reach point B from point A?



21 Nov 2004, Q66

- (A) 15 (B) 35
(C) 120 (D) 336

40. A new flag is to be designed with six vertical stripes using some or all of the colours yellow, green, blue and red. Then, the number of ways this can be done such that no two adjacent stripes have the same colour is

21 Nov 2004, Q73

- (A) 12×81 (B) 16×192
(C) 20×125 (D) 24×216

CAT 2003 Re-test (15 Feb 2004) - Questions 41-45

41. There are 12 towns grouped into four zones with three towns per zone. It is intended to connect the towns with telephone lines such that every two towns are connected with three direct lines if they belong to the same zone, and with only one direct line otherwise. How many direct telephone lines are required?

15 Feb 2004, CAT 2003 Re-test, Q60

- (A) 72 (B) 90
(C) 96 (D) 144

42. An intelligence agency forms a code of two distinct digits selected from 0, 1, 2, ..., 9 such that the first digit of the code is non-zero. The code, handwritten on a slip, can however potentially create confusion when read upside down — for example, the code 91 may appear as 16. How many codes are there for which no such confusion can arise?

15 Feb 2004, CAT 2003 Re-test, Q67

- (A) 80 (B) 78
(C) 71 (D) 69

Questions 43 to 44

Directions for questions 97 and 98: Answer the questions on the basis of the information given below.

A string of three English letters is formed as per the following rules:

- I. The first letter is any vowel.
- II. The second letter is m, n or p.
- III. If the second letter is m, then the third letter is any vowel which is different from the first letter.
- IV. If the second letter is n, then the third letter is e or u.
- V. If the second letter is p, then the third letter is the same as the first letter.

43. How many strings of letters can possibly be formed using the above rules?

15 Feb 2004, CAT 2003 Re-test, Q97

- (A) 40 (B) 45
(C) 30 (D) 35

44. How many strings of letters can possibly be formed using the above rules such that the third letter of the string is e?

15 Feb 2004, CAT 2003 Re-test, Q98

- (A) 8 (B) 9
(C) 10 (D) 11

45. A survey on a sample of 25 new cars being sold at a local auto dealer was conducted to see which of the three popular options — air conditioning, radio and power windows were already installed. Following were the observation of the survey: I. 15 had air conditioning II. 2 had air conditioning and power windows but no radios III. 12 had radio IV. 6 had air conditioning and radio but no power windows V. 11 had

power windows VI. 4 had radio and power windows VII. 3 had all three options What is the number of cars that had none of the options?

15 Feb 2004, CAT 2003 Re-test, Q100

- | | |
|-------|-------|
| (A) 4 | (B) 3 |
| (C) 1 | (D) 2 |
-

46. Twenty-seven persons attend a party. Which one of the following statements can never be true?

23 Nov 2003, CAT 2003 Original sitting, Q115

- (A) There is a person in the party who is acquainted with all the twenty-six others.
- (B) Each person in the party has a different number of acquaintances.
- (C) There is a person in the party who has an odd number of acquaintances.
- (D) In the party, there is no set of three mutual acquaintances.

47. How many three digit positive integers, with digits x , y and z in the hundred's, ten's and unit's place respectively, exist such that $x < y$, $z < y$ and $x \neq 0$?

23 Nov 2003, CAT 2003 Original sitting, Q134

- | | |
|---------|---------|
| (A) 245 | (B) 285 |
| (C) 240 | (D) 320 |

48. There are 6 boxes numbered 1,2,... 6. Each box is to be filled up either with a red or a green ball in such a way that at least 1 box contains a green ball and the boxes containing green balls are consecutively numbered. The total number of ways in which this can be done is

23 Nov 2003, CAT 2003 Original sitting, Q144

- | | |
|--------|--------|
| (A) 5 | (B) 21 |
| (C) 33 | (D) 60 |

49. A graph may be defined as a set of points connected by lines called edges. Every edge connects a pair of points. Thus, a triangle is a graph with 3 edges and 3 points. The degree of a point is the number of edges connected to it. For example, a triangle is a graph with three points of degree 2 each. Consider a graph with 12 points. It is possible to reach any point from any point through a sequence of edges. The number of edges, e , in the graph must satisfy the condition

23 Nov 2003, CAT 2003 Original sitting, Q148

- | | |
|-------------------------|-------------------------|
| (A) $11 \leq e \leq 66$ | (B) $10 \leq e \leq 66$ |
| (C) $11 \leq e \leq 65$ | (D) $0 \leq e \leq 11$ |

CAT 2002 - Questions 50-54

50. If there are 10 positive real numbers $n_1 < n_2 < n_3 \dots < n_{10}$, how many triplets of these numbers $(n_1, n_2, n_3), (n_2, n_3, n_4)$ can be generated such that in each triplet the first number is always less than the second number, and the second number is always less than the third number?

CAT 2002, Q51

- (A) 45 (B) 90
(C) 120 (D) 180

51. Ten straight lines, no two of which are parallel and no three of which pass through any common point, are drawn on a plane. The total number of regions (including finite and infinite regions) into which the plane would be divided by the lines is

CAT 2002, Q76

- (A) 56 (B) 255
(C) 1024 (D) not unique

Questions 52 to 53

Directions for the next two questions: Answer the questions based on the following information.

Each of the 11 letters A, H, I, M, O, T, U, V, W, X and Z appears same when looked at in a mirror. They are called symmetric letters. Other letters in the alphabet are asymmetric letters.

52. How many four-letter computer passwords can be formed using only the symmetric letters (no repetition allowed)?

CAT 2002, Q85

- (A) 7,920 (B) 330
(C) 14,640 (D) 4,19,430

53. How many three-letter computer passwords can be formed (no repetition allowed) with at least one symmetric letter?

CAT 2002, Q86

- (A) 990 (B) 2,730
(C) 12,870 (D) 15,600

54. In how many ways is it possible to choose a white square and a black square on a chessboard so that the squares must not lie in the same row or column?

CAT 2002, Q92

- (A) 56 (B) 896
(C) 60 (D) 768

CAT 2001 - Questions 55-55

55. Let n be the number of different five-digit numbers, divisible by 4 with the digits 1, 2, 3, 4, 5 and 6, no digit being repeated in the numbers. What is the value of n ?

CAT 2001, Q48

- (A) 144 (B) 168
(C) 192 (D) None of these
-

CAT 2000 - Questions 56-59

56. One red flag, three white flags and two blue flags are arranged in a line such that, A. no two adjacent flags are of the same colour B. the flags at the two ends of the line are of different colours. In how many different ways can the flags be arranged?

CAT 2000, Q63

- (A) 6 (B) 4
(C) 10 (D) 2

57. Sam has forgotten his friend's seven-digit telephone number. He remembers the following: a) the first three digits are either 635 or 674, b) the number is odd, and c) the number nine appears once. If Sam were to use a trial and error process to reach his friend, what is the minimum number of trials he has to make before he can be certain to succeed?

CAT 2000, Q72

- (A) 10000 (B) 2430
(C) 3402 (D) 3006

58. There are three cities A, B and C. Each of these cities is connected with the other two cities by at least one direct road. If a traveller wants to go from one city (origin) to another city (destination), she can do so either by traversing a road connecting the two cities directly, or by traversing two roads, the first connecting the origin to the third city and the second connecting the third city to the destination. In all there are 33 routes from A to B (including those via C). Similarly there are 23 routes from B to C (including those via A). How many roads are there from A to C directly?

CAT 2000, Q104

- (A) 6 (B) 3
(C) 5 (D) 10

59. ABCDEFGH is a regular octagon. A and E are opposite vertices of the octagon. A frog starts jumping from vertex to vertex, beginning from A. From any vertex of the octagon except E, it may jump to either of the two adjacent vertices. When it reaches E, the frog stops and says there. Let a_n be the number of distinct paths of exactly n jumps ending in E. Then, what is the value of a_{2n-1} ?

CAT 2000, Q106

- (A) Zero (B) Four
(C) $2n-1$ (D) Cannot be determined

CAT 1999 - Questions 60-62

60. Ten points are marked on a straight line and eleven points are marked on another straight line. How many triangles can be constructed with vertices from among the above points?

CAT 1999, Q59

- | | |
|----------|----------|
| (A) 495 | (B) 550 |
| (C) 1045 | (D) 2475 |
-

61. For a scholarship, at most n candidates out of $2n + 1$ can be selected. If the number of different ways of selection of at least one candidate is 63, the maximum number of candidates that can be selected for the scholarship is:

CAT 1999, Q60

- | | |
|-------|-------|
| (A) 3 | (B) 4 |
| (C) 2 | (D) 5 |
-

62. In a survey of political preference, 78% of those asked were in favor of at least one of the proposals: I, II and III. 50% of those asked favored proposal I, 30% favored proposal II, and 20% favored proposal III. If 5% of those asked favored all three of the proposals, what percentage of those asked favored more than one of the 3 proposals.

CAT 1999, Q66

- | | |
|--------|--------|
| (A) 10 | (B) 12 |
| (C) 17 | (D) 22 |
-

CAT 1998 - Questions 63-63

63. How many five digit numbers can be formed from 1, 2, 3, 4, 5, without repetition, when the digit at the unit's place must be greater than that in the ten's place?

CAT 1998, Q62

(A) 54

(B) 60

(C) 17

(D) $2 \times 4!$

Questions 64 to 66

A survey of 200 people in a community who watched at least one of the three channels — BBC, CNN and DD — showed that 80% of the people watched DD, 22% watched BBC, and 15% watched CNN.

64. What is the maximum percentage of people who can watch all the three channels?

CAT 1997, Q122

- (A) 12.5% (B) 8.5%
(C) 15% (D) Data insufficient

65. If 5% of people watched DD and CNN, 10% watched DD and BBC, then what percentage of people watched BBC and CNN only?

CAT 1997, Q123

- (A) 2% (B) 5%
(C) 8.5% (D) Cannot be determined

66. Referring to the previous question, what percentage of people watched all the three channels?

CAT 1997, Q124

- (A) 3.5% (B) 0%
(C) 8.5% (D) Cannot be determined

CAT 1996 - Questions 67-68

67. In a locality, two-thirds of the people have cable TV, one-fifth have VCR, and one-tenth have both. What is the fraction of people having atleast one among cable -TV and VCR?

CAT 1996, Q126

(A) $\frac{19}{30}$
(C) $\frac{17}{30}$

(B) $\frac{2}{3}$
(D) $\frac{23}{30}$

68. A man has 9 friends: 4 boys and 5 girls. In how many ways can he invite them, if there has to be exactly 3 girls in the invitees?

CAT 1996, Q138

(A) 320
(C) 80

(B) 160
(D) 200

CAT 1995 - Questions 69-70

69. Boxes numbered 1, 2, 3, 4 and 5 are kept in a row, and they are to be filled with either a red or a blue ball, such that no two adjacent boxes can be filled with blue balls. Then how many different arrangements are possible, given that all balls of a given colour are exactly identical in all respects?

CAT 1995, Q64

- | | |
|--------|--------|
| (A) 8 | (B) 10 |
| (C) 15 | (D) 22 |
-

70. A, B, C and D are four towns, any three of which are non-collinear. Then the number of ways to construct three roads each joining a pair of towns so that the roads do not form a triangle is

CAT 1995, Q87

- | | |
|-------|--------|
| (A) 7 | (B) 8 |
| (C) 9 | (D) 24 |
-

CAT 1993 - Questions 71-79

71. An intelligence agency decides on a code of 2 digits selected from 0, 1, 2, ..., 9. But the slip on which the code is hand-written allows confusion between top and bottom, because these are indistinguishable. Thus, for example, the code 91 could be confused with 16. How many codes are there such that there is no possibility of any confusion?

CAT 1993, Q60

- (A) 25 (B) 75
(C) 80 (D) None of these

72. 139 persons have signed up for an elimination tournament. All players are to be paired up for the first round, but because 139 is an odd number one player gets a bye, which promotes him to the second round, without actually playing in the first round. The pairing continues on the next round, with a bye to any player left over. If the schedule is planned so that a minimum number of matches is required to determine the champion, the number of matches which must be played is

CAT 1993, Q63

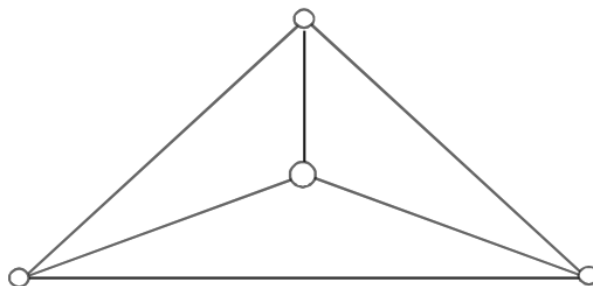
- (A) 136 (B) 137
(C) 138 (D) 139

73. There are ten 50 paise coins placed on a table. Six of these show tails four show heads. A coin is chosen at random and flipped over (not tossed). This operation is performed seven times. One of the coins is then covered. Of the remaining nine coins, five show tails and four show heads. The covered coin shows

CAT 1993, Q64

- (A) a head (B) a tail
(C) more likely a head (D) more likely a tail

74. Four cities are connected by a road network as shown in the figure (a triangle with vertices and a centroid-like point connected to all three vertices). In how many ways can you start from any city and come back to it without travelling on the same road more than once?



CAT 1993, Q68

- (A) 8 (B) 12
(C) 16 (D) 20

Questions 75 to 76

Use the following information: Eighty five children went to an amusement park where they could ride on the merry-go-round, roller coaster, and Ferris wheel. It was known that 20 of them took all three rides, and 55 of them took at least two of the three rides. Each ride cost Re. 1, and the total receipt of the amusement park was Rs. 145.

75. How many children did not try any of the rides?

CAT 1993, Q69

- | | |
|--------|--------|
| (A) 5 | (B) 10 |
| (C) 15 | (D) 20 |
-

76. How many children took exactly one ride?

CAT 1993, Q70

- | | |
|--------|--------|
| (A) 5 | (B) 10 |
| (C) 15 | (D) 20 |
-

77. A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of a different size. The probability that the red ball selected is the smallest red ball, is

CAT 1993, Q77

- | | |
|--------------------|-------------------|
| (A) $\frac{1}{18}$ | (B) $\frac{1}{3}$ |
| (C) $\frac{1}{6}$ | (D) $\frac{2}{3}$ |
-

78. Consider the five points comprising of the vertices of a square and the intersection point of its diagonals. How many triangles can be formed using these points?

CAT 1993, Q84

- | | |
|-------|--------|
| (A) 4 | (B) 6 |
| (C) 8 | (D) 10 |
-

79. Out of 100 families in the neighbourhood, 45 own radios, 75 have TVs, 25 have VCRs. Only 10 families have all three and each VCR owner also has a TV. If 25 families have radio only, how many have only TV?

CAT 1993, Q85

- | | |
|--------|--------|
| (A) 30 | (B) 35 |
| (C) 40 | (D) 45 |
-

CAT 1991 - Questions 80-84

80. How many 3 - digit even number can you form such that if one of the digits is 5, the following digit must be 7?

CAT 1991, Q63

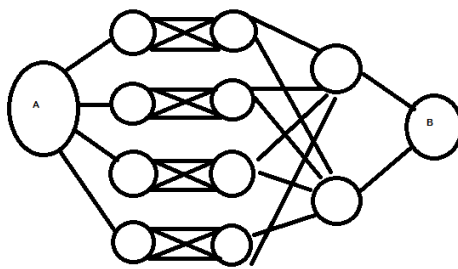
- (A) 5 (B) 405
(C) 365 (D) 495

81. Fifty college teachers are surveyed as to their possession of colour TV, VCR and tape recorder. Of them, 22 own colour TV, 15 own VCR and 14 own tape recorders. Nine of these college teachers own exactly two items out of colour TV, VCR and tape recorder; and, one college teacher owns all three. How many of the 50 teachers own none of the three, colour TV, VCR or tape recorder?

CAT 1991, Q66

- (A) 4 (B) 9
(C) 10 (D) 11

82. What is the total number of ways to reach A to B in the network given, such that no node is included twice and one can only move from left to right?



CAT 1991, Q68

- (A) 24 (B) 32
(C) 48 (D) 60

83. A player rolls a die and receives the same number of rupees as the number of dots on the face that turns up. What should the player pay for each roll if he wants to make a profit of one rupee per throw of the die in the long run?

CAT 1991, Q77

- (A) Rs. 2.50 (B) Rs. 2
(C) Rs.3.50 (D) Rs. 4

84. There are 3 clubs A, B & C in a town with 40, 50 & 60 members respectively. While 10 people are members of all 3 clubs, 70 are members in only one club. How many belong to exactly two clubs?

CAT 1991, Q80

- (A) 20 (B) 25
(C) 50 (D) 70

CAT 1990 - Questions 85-87

85. There are six boxes numbered 1, 2, 3, 4, 5, 6. Each box is to be filled up either with a white ball or a black ball in such a manner that at least one box contains a black ball and all the boxes containing black balls are consecutively numbered. The total number of ways in which this can be done equals.

CAT 1990, Q17

- | | |
|--------|--------|
| (A) 15 | (B) 21 |
| (C) 63 | (D) 64 |

86. 116 people participated in a singles tennis tournament of knock out format. The players are paired up in the first round, the winners of the first round are paired up in second round, and so on till the final is played between two players. If after any round, there is odd number of players, one player is given a bye, i.e. he skips that round and plays the next round with the winners. Find the total number of matches played in the tournament.

CAT 1990, Q22

- | | |
|---------|---------|
| (A) 115 | (B) 53 |
| (C) 232 | (D) 116 |

87. If equal numbers of people are born on each day, find the approximate percentage of the people whose birthday will fall on 29th February. If we are to consider people born in 20th century (1901-2000) and assuming no deaths.

CAT 1990, Q48

- | | |
|------------|-------------------|
| (A) 0.374 | (B) 0.5732 |
| (C) 0.0664 | (D) None of these |

- End of PYQ Collection -