Arithmetic
Actual CAT Problems 2001-2005

CAT 2001

1. A student took five papers in an examination, where the full marks were the same for each paper. His marks in these papers were in the proportion of 6 : 7 : 8 : 9 : 10. In all papers together, the candidate obtained 60% of the total marks. Then the number of papers in which he got more than 50% marks is

    a. 2   b. 3   c. 4   d. 5

2. A can complete a piece of work in 4 days. B takes double the time taken by A, C takes double that of B, and D takes double that of C to complete the same task. They are paired in groups of two each. One pair takes two-thirds the time needed by the second pair to complete the work. Which is the first pair?

    a. A and B   b. A and C   c. B and C   d. A and D

3. Two men X and Y started working for a certain company at similar jobs on January 1, 1950. X asked for an initial salary of Rs. 300 with an annual increment of Rs. 30. Y asked for an initial salary of Rs. 200 with a rise of Rs. 15 every 6 months. Assume that the arrangements remained unaltered till December 31, 1959. Salary is paid on the last day of the month. What is the total amount paid to them as salary during the period?

    a. Rs. 93,300   b. Rs. 93,200   c. Rs. 93,100   d. None of these

4. A college has raised 75% of the amount it needs for a new building by receiving an average donation of Rs. 600 from the people already solicited. The people already solicited represent 60% of the people the college will ask for donations. If the college is to raise exactly the amount needed for the new building, what should be the average donation from the remaining people to be solicited?

    a. Rs. 300   b. Rs. 250   c. Rs. 400   d. 500

5. Three friends, returning from a movie, stopped to eat at a restaurant. After dinner, they paid their bill and noticed a bowl of mints at the front counter. Sita took one-third of the mints, but returned four because she had a momentary pang of guilt. Fatima then took one-fourth of what was left but returned three for similar reason. Eswari then took half of the remainder but threw two back into the bowl. The bowl had only 17 mints left when the raid was over. How many mints were originally in the bowl?

    a. 38   b. 31   c. 41   d. None of these

6. If 09/12/2001(DD/MM/YYYY) happens to be Sunday, then 09/12/1971 would have been a

    a. Wednesday   b. Tuesday   c. Saturday   d. Thursday

7. At his usual rowing rate, Rahul can travel 12 miles downstream in a certain river in 6 hr less than it takes him to travel the same distance upstream. But if he could double his usual rowing rate for this 24 miles round trip, the downstream 12 miles would then take only 1 hr less than the upstream 12 miles. What is the speed of the current in miles per hour?

   a. $\dfrac{7}{3}$ b. $\dfrac{4}{3}$ c. $\dfrac{5}{3}$ d. $\dfrac{8}{3}$

8. Shyama and Vyom walk up an escalator (moving stairway). The escalator moves at a constant speed. Shyama takes three steps for every two of Vyom's steps. Shyama gets to the top of the escalator after having taken 25 steps, while Vyom (because his slower pace lets the escalator do a little more of the work) takes only 20 steps to reach the top. If the escalator were turned off, how many steps would they have to take to walk up?

   a. 40   b. 50   c. 60   d. 80

9. There's a lot of work in preparing a birthday dinner. Even after the turkey is in the oven, there's still the potatoes and gravy, yams, salad, and cranberries, not to mention setting the table.
   Three friends — Asit, Arnold and Afzal — work together to get all of these chores done. The time it takes them to do the work together is 6 hr less than Asit would have taken working alone, 1 hr less than Arnold would have taken alone, and half the time Afzal would have taken working alone. How long did it take them to do these chores working together?

   a. 20 min   b. 30 min   c. 40 min   d. 50 min

10. Fresh grapes contain 90% water by weight while dried grapes contain 20% water by weight. What is the weight of dry grapes available from 20 kg of fresh grapes?

    a. 2 kg   b. 2.4 kg   c. 2.5 kg   d. None of these

11. Train X departs from station A at 11 a.m. for station B, which is 180 km so far. Train Y departs from station B at 11 a.m. for station A. Train X travels at an average speed of 70 km/hr and does not stop anywhere until it arrives at station B. Train Y travels at an average speed of 50 km/hr, but has to stop for 15 min at station C, which is 60 km away from station B enroute to station A. Ignoring the lengths of the trains, what is the distance, to the nearest kilometre, from station A to the point where the trains cross each other?

    a. 112 km   b. 118 km   c. 120 km   d. None of these

12. The owner of an art shop conducts his business in the following manner: every once in a while he raises his prices by X%, then a while later he reduces all the new prices by X%. After one such up-down cycle, the price of a painting decreased by Rs. 441. After a second up-down cycle the painting was sold for Rs. 1,944.81. What was the original price of the painting?

    a. Rs. 2,756.25   b. Rs. 2,256.25   c. Rs. 2,500   d. Rs. 2,000

13. Three runners A, B and C run a race, with runner A finishing 12 m ahead of runner B and 18 m ahead of runner C, while runner B finishes 8 m ahead of runner C. Each runner travels the entire distance at a constant speed. What was the length of the race?

    a. 36 m   b. 48 m   c. 60 m   d. 72 m

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14. Ashish is given Rs. 158 in one-rupee denominations. He has been asked to allocate them into a number of bags such that any amount required between Re 1 and Rs. 158 can be given by handing out a certain number of bags without opening them. What is the minimum number of bags required?
    a. 11   b. 12   c. 13   d. None of these

15. A change-making machine contains one-rupee, two-rupee and five-rupee coins. The total number of coins is 300. The amount is Rs. 960. If the numbers of one-rupee coins and two-rupee coins are interchanged, the value comes down by Rs. 40. The total number of five-rupee coins is
    a. 100   b. 140   c. 60   d. 150

CAT 2002

16. On a straight road XY, 100 m long, five heavy stones are placed 2 m apart beginning at the end X. A worker, starting at X, has to transport all the stones to Y, by carrying only one stone at a time. The minimum distance he has to travel is
    a. 472 m   b. 422 m   c. 744 m   d. 860 m

17. Only a single rail track exists between stations A and B on a railway line. One hour after the north-bound super fast train N leaves station A for station B, a south-bound passenger train S reaches station A from station B. The speed of the super fast train is twice that of a normal express train E, while the speed of a passenger train S is half that of E. On a particular day, N leaves for B from A, 20 min behind the normal schedule. In order to maintain the schedule, both N and S increased their speeds. If the super fast train doubles its speed, what should be the ratio (approximately) of the speeds of passenger train to that of the super fast train so that the passenger train S reaches exactly at the scheduled time at A on that day?
    a. 1 : 3   b. 1 : 4   c. 1 : 5   d. 1 : 6

18. On a 20 km tunnel, connecting two cities A and B, there are three gutters (1, 2 and 3). The distance between gutters 1 and 2 is half the distance between gutters 2 and 3. The distance from city A to its nearest gutter, gutter 1, is equal to the distance of city B from gutter 3. On a particular day, the hospital in city A receives information that an accident has happened at gutter 3. The victim can be saved only if an operation is started within 40 min. An ambulance started from city A at 30 km/hr and crossed gutter 1 after 5 min. If the driver had doubled the speed after that, what is the maximum amount of time would the doctor get to attend the patient at the hospital. Assume 1 min is elapsed for taking the patient into and out of the ambulance?
    a. 4 min
    b. 2.5 min
    c. 1.5 min
    d. The patient died before reaching the hospital

19. The owner of a local jewellery store hired three watchmen to guard his diamonds, but a thief still got in and stole some diamonds. On the way out, the thief met each watchman, one at a time. To each he gave $\frac{1}{2}$ of the diamonds he had then, and 2 more besides. He escaped with one diamond. How many did he steal originally?

    a. 40   b. 36   c. 25   d. None of these

20. Mayank, Mirza, Little and Jaspal bought a motorbike for $60. Mayank paid one-half of the sum of the amounts paid by the other boys. Mirza pad one-third of the sum of the amounts paid by the other boys. Little paid one-fourth of the sum of the amounts paid by the other boys. How much did Jaspal have to pay?

    a. $15   b. $13   c. $17   d. None of these

21. A rich merchant had collected many gold coins. He did not want anybody to know about him. One day, his wife asked, " How many gold coins do we have?" After a brief pause, he replied, "Well! if I divide the coins into two unequal numbers, then 48 times the difference between the two numbers equals the difference between the squares of the two numbers." The wife looked puzzled. Can you help the merchant's wife by finding out how many gold coins the merchant has?

    a. 96   b. 53   c. 43   d. None of these

22. Shyam visited Ram during his brief vacation. In the mornings they both would go for yoga. In the evenings they would play tennis. To have more fun, they indulge only in one activity per day, i.e. either they went for yoga or played tennis each day. There were days when they were lazy and stayed home all day long. There were 24 mornings when they did nothing, 14 evenings when they stayed at home, and a total of 22 days when they did yoga or played tennis. For how many days Shyam stayed with Ram?

    a. 32   b. 24   c. 30   d. None of these

23. A car rental agency has the following terms. If a car is rented for 5 hr or less, then, the charge is Rs. 60 per hour or Rs. 12 per kilometre whichever is more. On the other hand, if the car is rented for more than 5 hr, the charge is Rs. 50 per hour or Rs. 7.50 per kilometre whichever is more. Akil rented a car from this agency, drove it for 30 km and ended up playing Rs. 300. For how many hours did he rent the car?

    a. 4 hr   b. 5 hr   c. 6 hr   d. None of these

24. At a bookstore, 'MODERN BOOK STORE' is flashed using neon lights. The words are individually flashed at the intervals of $2\frac{1}{2}$ s, $4\frac{1}{4}$ s and $5\frac{1}{8}$ s respectively, and each word is put off after a second.

    The least time after which the full name of the bookstore can be read again is

    a. 49.5 s   b. 73.5 s   c. 1744.5 s   d. 855 s

25. Three pieces of cakes of weights $4\dfrac{1}{2}$ lb, $6\dfrac{3}{4}$ lb and $7\dfrac{1}{5}$ lb respectively are to be divided into parts of equal weight. Further, each part must be as heavy as possible. If one such part is served to each guest, then what is the maximum number of guests that could be entertained?

    a. 54   b. 72   c. 20   d. None of these

Directions for questions 26 and 27: Answer the questions based on the following information.
A boy is asked to put one mango in a basket when ordered 'One', one orange when ordered 'Two', one apple when ordered 'Three', and is asked to take out from the basket one mango and an orange when ordered 'Four'. A sequence of orders is given as:

1 2 3 3 2 1 4 2 3 1 4 2 2 3 3 1 4 1 1 3 2 3 4

26. How many total oranges were in the basket at the end of the above sequence?

    a. 1   b. 4   c. 3   d. 2

27. How many total fruits will be in the basket at the end of the above order sequence?

    a. 9   b. 8   c. 11   d. 10

28. A train approaches a tunnel AB. Inside the tunnel is a cat located at a point that is $\dfrac{3}{8}$ of the distance AB measured from the entrance A. When the train whistles the cat runs. If the cat moves to the entrance of the tunnel A, the train catches the cat exactly at the entrance. If the cat moves to the exit B, the train catches the cat at exactly the exit. The speed of the train is greater than the speed of the cat by what order?

    a. 3 : 1   b. 4 :1   c. 5 : 1   d. None of these

29. Three travellers are sitting around a fire, and are about to eat a meal. One of them has 5 small loaves of bread, the second has 3 small loaves of bread. The third has no food, but has 8 coins. He offers to pay for some bread. They agree to share the 8 loaves equally among the three travellers, and the third traveller will pay 8 coins for his share of the 8 loaves. All loaves were the same size. The second traveller (who had 3 loaves) suggests that he will be paid 3 coins, and that the first traveller be paid 5 coins. The first traveller says that he should get more than 5 coins. How much should the first traveller get?

    a. 5   b. 7   c. 1   d. None of these

30. It takes six technicians a total of 10 hr to build a new server from Direct Computer, with each working at the same rate. If six technicians start to build the server at 11 am, and one technician per hour is added beginning at 5 pm, at what time will the server be completed?

    a. 6.40 pm   b. 7 pm   c. 7.20 pm   d. 8 pm

31. Davji Shop sells samosas in boxes of different sizes. The samosas are priced at Rs. 2 per samosa up to 200 samosas. For every additional 20 samosas, the price of the whole lot goes down by 10 paise per samosa. What should be the maximum size of the box that would maximise the revenue?

a. 240   b. 300   c. 400   d. None of these

32. Three small pumps and a large pump are filling a tank. Each of the three small pump works at $\frac{2}{3}$ the rate of the large pump. If all four pumps work at the same time, they should fill the tank in what fraction of the time that it would have taken the large pump alone?

a. $\frac{4}{7}$ b. $\frac{1}{3}$ c. $\frac{2}{3}$ d. $\frac{3}{4}$

CAT 2003 (Leaked)

Directions for questions 33 and 34: Answer the questions on the basis of the information given below.

A certain perfume is available at a duty-free shop at the Bangkok international airport. It is priced in the Thai currency Baht but other currencies are also acceptable. In particular, the shop accepts Euro and US Dollar at the following rates of exchange:

US Dollar 1 = 41 Bahts
Euro 1 = 46 Bahts

The perfume is priced at 520 Bahts per bottle. After one bottle is purchased, subsequent bottles are available at a discount of 30%. Three friends S, R and M together purchase three bottles of the perfume, agreeing to share the cost equally. R pays 2 Euros. M pays 4 Euros and 27 Thai Bahts and S pays the remaining amount in US Dollars.

33. How much does R owe to S in Thai Baht?
    a. 428   b. 416   c. 334   d. 324

34. How much does M owe to S in US Dollars?
    a. 3   b. 4   c. 5   d. 6

Directions for questions 35 to 40: Answer the questions independently of each other.

35. A test has 50 questions. A student scores 1 mark for a correct answer, –1/3 for a wrong answer, and –1/6 for not attempting a question. If the net score of a student is 32, the number of questions answered wrongly by that student cannot be less than
    a. 6   b. 12   c. 3   d. 9

36. In a 4000 meter race around a circular stadium having a circumference of 1000 meters, the fastest runner and the slowest runner reach the same point at the end of the 5th minute, for the first time after the start of the race. All the runners have the same starting point and each runner maintains a uniform speed throughout the race. If the fastest runner runs at twice the speed of the slowest runner, what is the time taken by the fastest runner to finish the race?
a. 20 min   b. 15 min   c. 10 min   d. 5 min

37. At the end of year 1998, Shepard bought nine dozen goats. Henceforth, every year he added p% of the goats at the beginning of the year and sold q% of the goats at the end of the year where p > 0 and q > 0. If Shepard had nine dozen goats at the end of year 2002, after making the sales for that year, which of the following is true?
a. p = q   b. p < q   c. p > q   d. p = q/2

CAT 2003 (Re test)

38. Consider two different cloth-cutting processes. In the first one, n circular cloth pieces are cut from a square cloth piece of side *a* in the following steps: the original square of side *a* is divided into *n* smaller squares, not necessarily of the same size, then a circle of maximum possible area is cut from each of the smaller squares. In the second process, only one circle of maximum possible area is cut from the square of side *a* and the process ends there. The cloth pieces remaining after cutting the circles are scrapped in both the processes. The ratio of the total area of scrap cloth generated in the former to that in the latter is

a. 1 : 1   b. $\sqrt{2}$: 1   c. $\dfrac{n(4-\pi)}{4n-\pi}$ d. $\dfrac{4n-\pi}{n(4-\pi)}$

39. Using only 2, 5, 10, 25, and 50 paisa coins, what will be the minimum number of coins required to pay exactly 78 paise, 69 paise and Rs. 1.01 to three different persons?
a. 19   b. 20   c. 17   d. 18

40. Two straight roads R1 and R2 diverge from a point A at an angle of 120°. Ram starts walking from point A along R1 at a uniform speed of 3 km/hr. Shyam starts walking at the same time from A along R2 at a uniform speed of 2 km/hr. They continue walking for 4 hr along their respective roads and reach points B and C on R1 and R2 respectively. There is a straight line path connecting B and C. Then Ram returns to point A after walking along the line segments BC and CA. Shyam also returns to A after walking along line segments BC and CA. Their speeds remains unchanged. The time interval (in hours) between Ram's and Shyam's return to the point A is

a. $\dfrac{10\sqrt{19}+26}{3}$ b. $\dfrac{2\sqrt{19}+10}{3}$ c. $\dfrac{\sqrt{19}+26}{3}$ d. $\dfrac{\sqrt{19}+10}{3}$

CAT 2004

41. A milkman mixes 20 litres of water with 80 litres of milk. After selling one-fourth of this mixture, he adds water to replenish the quantity that he had sold. What is the current proportion of water to milk?
a. 2 : 3   b. 1 : 2   c. 1 : 3   d. 3 : 4

42.   In NutsAndBolts factory, one machine produces only nuts at the rate of 100 nuts per minute and needs to be cleaned for 5 minutes after production of every 1000 nuts. Another machine produces only bolts at the rate of 75 bolts per minute and needs to be cleaned for10 minutes after production of every 1500 bolts. If both the machines start production at the same time, what is the minimum duration required for producing 9000 pairs of nuts and bolts?
       a. 130 minutes   b. 135 minutes   c. 170 minutes   d. 180 minutes

Directions for questions 43 and 44: Answer the questions on the basis of the information given below. In an examination, there are 100 questions divided into three groups A, B and C such that each group contains at least one question. Each question in group A carries 1 mark, each question in group B carries 2 marks and each question in group C carries 3 marks. It is known that the questions in group A together carry at least 60% of the total marks.

43.   If group B contains 23 questions, then how many questions are there in Group C?
       a. 1   b. 2   c. 3   d. Cannot be determined

44.   If group C contains 8 questions and group B carries at least 20% of the total marks, which of the following best describes the number of questions in group B?
       a. 11 or 12   b. 12 or 13   c. 13 or 14   d. 14 or 15

CAT 2005

Directions for questions 45 and 46: Answer the questions on the basis of the information given below. Ram and Shyam run a race between points A and B, 5 km apart, Ram starts at 9 a.m from A at a speed of 5 km/hr, reaches B, and returns to A at the same speed, Shyam starts at 9:45 a.m. from A at a speed of 10 km/hr, reaches B and comes back to A at the same speed.

45.   At what time do Ram and Shyam first meet each other?
       a. 10 a.m   b. 10:10 a.m   c. 10:20 a.m   d. 10:30 a.m.

46.   At what time does Shyam over take Ram?
       a. 10:20 a.m   b. 10:30 a.m   c. 10:40 a.m   d. 10:50 a.m

47.   A telecom service provider engages male and female operators for answering 1000 calls per day. A male operator can handle 40 calls per day whereas a female operator can handle 50 calls per day. The male and the female operators get a fixed wage of Rs. 250 and Rs. 300 per day respectively. In addition, a male operator gets Rs. 15 per call he answers and female operator gets Rs. 10 per call she answers. To minimize the total cost, how many male operators should the service provider employ assuming he has to employ more than 7 of the 12 female operators available for the job?
       a. 15   b. 14   c. 12   d. 10