Solved CAT-2001 Paper

SECTION—1

No. of Questions: 50

Directions for questions 1 to 5: *Each question is independent of each other.*

1. Ujakar and Keshav attempted to solve a quadratic equation. Ujakar made a mistake in writing down the constant term. He ended up with the roots (4, 3). Keshav made a mistake in writing down the coefficient of x. He got the roots as (3, 2). What will be the exact roots of the original quadratic equation?

(*a*) (6, 1) (*b*) (–3, –4)
(*c*) (4, 3) (*d*) (–4, –3)

2. A ladder leans against a vertical wall. The top of the ladder is 8 m above the ground. When the bottom of the ladder is moved 2 m farther away from the wall, the top of the ladder rests against the foot of the wall. What is the length of the ladder?

(*a*) 10 m (*b*) 15 m
(*c*) 20 m (*d*) 17 m

3. 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

4. A certain city has a circular wall around it, and the wall has four gates pointing north, south, east and west. A house stands outside the city, three kms north of the north gate, and it can just be seen from a point nine kms east of the South Gate. What is the diameter of the wall that surrounds the city?

(*a*) 6 km (*b*) 9 km
(*c*) 12 km (*d*) None of these

5. Let x, y and z be distinct integers, x and y are odd and positive, and z is even and positive. Which one of the following statements can not be true?

(*a*) $(x - z)^2 y$ is even (*b*) $(x - y)y^2$ is odd
(*c*) $(x - z)y$ is odd (*d*) $(x - y)^2 z$ is even

6. A square, whose side is 2 meters, has its corners cut away so as to form an octagon with all sides equal. Then the length of each side of the octagon, in meters is:

(*a*) $\frac{(\sqrt{2})}{(\sqrt{2+1})}$ (*b*) $\frac{(2)}{(\sqrt{2+1})}$

(*c*) $\frac{(2)}{(\sqrt{2-1})}$ (*d*) $\frac{(\sqrt{2})}{(\sqrt{2-1})}$

7. All the page numbers from a book are added, beginning at page 1. However, one page number was mistakenly added twice. The sum obtained was 1000. Which page number was added twice?

(*a*) 44 (*b*) 45
(*c*) 10 (*d*) 12

8. x and y are real numbers satisfying the conditions $2 < x < 3$ and $-8 < y < -7$. Which of the following expressions will have the least value?

(*a*) x^2y (*b*) xy^2 (*c*) 5xy (*d*) None of these

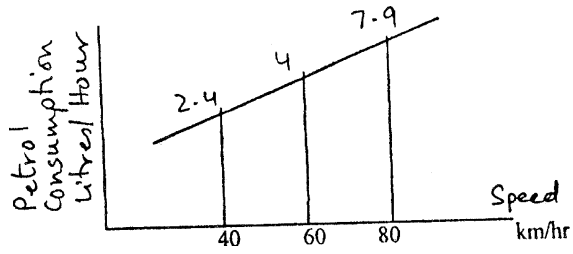
9. In a number system the product of 44 and 11 is 2124. The number 3111 of this system, when converted to the decimal number system, becomes:

(*a*) 406 (*b*) 1086 (*c*) 213 (*d*) 691

10. A does 120 surveys in a week and gets Rs 3600. B is 1.2 times more efficient than A. Also, A is 25% more efficient than C. Each of them works for one week. Which of the following statements is not correct?

(*a*) B gets 20% more than A
(*b*) A and C together get double of what B alone gets
(*c*) B gets 50% more than C
(*d*) A, B, C together get triple of what A alone gets

Directions for questions 11 to 12: *The petrol consumption rate of a new car 'Palto' depends on its speed and may be described by the graph below:*



11. Manisha makes the 200 km trip from Mumbai in Pune at a steady speed of 60 km per hour. What is the amount of petrol consumed for the journey?

(*a*) 12.5 litres (*b*) 13.33 litres
(*c*) 16 litres (*d*) 19.75 litres

12. Manisha would like to minimise the fuel consumption for the trip by driving at the appropriate speed. How should she change the speed?

(*a*) Increase the speed (*b*) Decrease the speed
(*c*) Maintain the speed at 60 km/hour
(*d*) Cannot be determined

Directions for questions 13 and 14:

The batting average (BA) of a test batsman is computed from runs scored and innings played—completed innings and incomplete innings (not out) in the following manner:

r_1 = number of runs scored in completed innings
n_1 = number of completed innings
r_2 = number of runs scored in incomplete innings
n_2 = number of incomplete innings.

$$BA = \frac{(r_1 + r_2)}{n_1}$$

To better assess a batsman's accomplishments, the ICC is considering two other measures MBA_1 and MBA_2 defined as follows:

$$MBA_1 = \frac{r_1}{n_1} + \frac{n_2}{n_1} + \max\left[0, \left(\frac{r_2}{n_2} - \frac{r_1}{n_1}\right)\right]$$

$$MBA_2 = \frac{(r_1 + r_2)}{(n_1 + n_2)}$$

13. Based on the information provided which of the following is true?

(*a*) $MBA_1 \le BA \le MBA_2$

(*b*) $BA \le MBA_2 \le MBA_1$

(*c*) $MBA_2 \le BA \le MBA_1$

(*d*) None of these

14. An experienced cricketer with no incomplete innings has a BA of 50. The next time he bats, the innings is incomplete and he scores 45 runs. It can be inferred that:

(*a*) BA and MBA_1 will both increase

(*b*) BA will increase and MBA_2 will decrease

(*c*) BA will increase and not enough data is available to assess change in MBA_1 and MBA_2

(*d*) None of these

Directions for questions 15 to 50: *Answer the questions independent of each other.*

15. Raju has 128 boxes with him. He has to put atleast 120 oranges in one box and 144 at the most. Find the least number of boxes which will have the same number of oranges.

(*a*) 5 (*b*) 103

(*c*) 6 (*d*) Cannot be determined

16. Every ten years the Indian government counts all the people living in the country. Suppose that the director of the census has reported the following data on two neighbouring villages Chota Hazri and Mota Hazri:

Chota Hazri has 4,522 fewer males than Mota Hazri

Mota Hazri has 4,020 more females than males.

Chota Hazri has twice as many females as males.

Chota Hazri has 2,910 fewer females than Mota Hazri.

What is the total number of males in Chota Hazri?

(*a*) 11264 (*b*) 14174

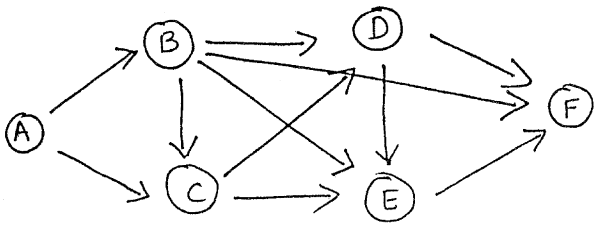
(*c*) 5632 (*d*) 10154

17. If $x > 5$ and $y < -1$, then which of the following statements is true?

(*a*) $(x + 4y) > 1$ (*b*) $x > -4y$

(*c*) $-4x < 5y$ (*d*) None of these

18. The figure below shows the network connecting cities, A, B, C, D, E and F. The arrows indicate permissible direction of travel. What is the number of distinct paths from A to F?



(*a*) 9 (*b*) 10

(*c*) 11 (*d*) None of these

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

(*a*) 36 meters (*b*) 48 meters

(*c*) 60 meters (*d*) 72 meters

20. Consider a triangle. Its longest side has length 20 and another of its sides has length 10. Its area is 80. What is the exact length of its third side?

(*a*) $\sqrt{260}$ (*b*) $\sqrt{250}$

(*c*) $\sqrt{240}$ (*d*) $\sqrt{270}$

21. A train X departs from station A at 11.00 a.m. for station B, which is 180 km away. Another train Y departs from station B at the same time. 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 minutes at station C, which is 60 km away from station B enroute to station A. At what distance from A would they meet?

(*a*) 112 (*b*) 118

(*c*) 120 (*d*) None of these

22. Three friends, returning from a movie, stopped to eat at a restaurant. After dinner, they paid their bill and noticed of mints at the front counter. Sita took 1/3 of the mints, but returned four because she had a momentary pang of guilt. Fatima then took 1/4 of what was left but returned three for similar reasons. 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

23. The tax on a commodity is diminished by 25% and its consumption increases by 20%. Now, a person can save what per cent more/less from before?

(*a*) 10% more (*b*) 10% less

(*c*) cannot be determined (*d*) None of these

24. If a, b, c and d are four positive real numbers such that abcd = 1, what is the minimum value of $(1 + a)(1 + b)(1 + c)(1 + d)$.

(*a*) 4 (*b*) 1

(*c*) 16 (*d*) 18

25. Anita had to do a multiplication. Instead of taking 35 as one of the multipliers, she took 53. As a result, the product went up by 540. What is the new product?

(*a*) 1050 (*b*) 540

(*c*) 1440 (*d*) 1590

26. 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 1944.81. What was the original price of the painting?

(*a*) 2756.25 (*b*) 2256.25

(*c*) 2500 (*d*) 2000

27. A set of consecutive positive integers beginning with 1 is written on the blackboard. A student came along and erased one number. The average of the remaining numbers is $35\frac{7}{17}$. What was the number erased?

(*a*) 7 (*b*) 8

(*c*) 9 (*d*) None of these

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

(*a*) 144 (*b*) 168

(*c*) 192 (*d*) None of these

29. Three math classes: X, Y, and Z, take an algebra test.

The average score in class X is 83.

The average score in class Y is 76.

The average score in class Z is 85.

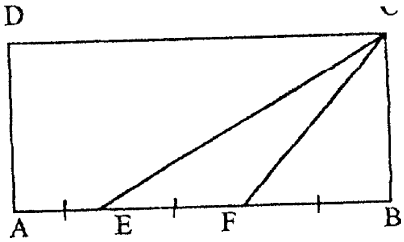
The average score of all sudents in classes X and Y together is 79.

The average score of all students in classes Y and Z together is 81.

What is the average for all the three clalsses?

(*a*) 81 (*b*) 81.5
(*c*) 82 (*d*) 84.5

30. In the diagram, ABCD is a rectangle with AE=EF=FB. What is the ratio of the area of the triangle CEF and that of the rectangle?



(*a*) $\frac{1}{6}$ (*b*) $\frac{1}{8}$
(*c*) $\frac{1}{9}$ (*d*) None of these

31. At a certain fast food restaurant, Bakshi can buy 3 burgers, 7 shakes, and one order of fries for Rs 120. At the same place it would cost Rs 164.50 for 4 burgers, 10 shakes, and one order of fries. How much would it cost for a meal of one burger, one shake, and one order of fries?

(*a*) Rs 31 (*b*) Rs 41
(*c*) Rs 21 (*d*) Cannot be determined

32. 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, B (*b*) A, C
(*c*) B, C (*d*) A, D

33. In a 4-digit number, the sum of the first two digits is equal to that of the last two digits. The sum of the first and last digits is equal to the third digit. Finally, the sum of the second and fourth digits is twice the sum of the other two digits. What is the third digit of the number?

(*a*) 5 (*b*) 8
(*c*) 1 (*d*) 4

34. 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 total 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*) Rs 500

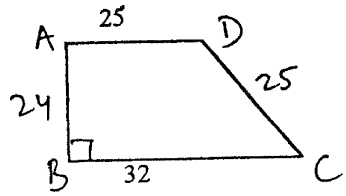
35. A, B and C went to buy ration from a wholesale market. They had a combined sum of Rs 900. A spent 80%, B spent 70% and C spent 75% of their respective amounts. Now the ratio of amounts left with them is 4 : 9 : 10. Find the ratio of amounts they had in the beginning.

(*a*) 2 : 4 : 3 (*b*) 3 : 4 : 2
(*c*) 5 : 2 : 2 (*d*) 2 : 3 : 4

36. A red light flashes 3 times per minute and a green light flashes 5 times in two minutes at regular intervals. If both lights start flashing at the same time, how many times do they flash together in each hour?

(*a*) 30 (*b*) 24
(*c*) 20 (*d*) 60

37. Two sides of a plot measure 32 meters and 24 meters and the angle between them is a right angle. The other two sides measure 25 meters each and the other three angles are not right angles.



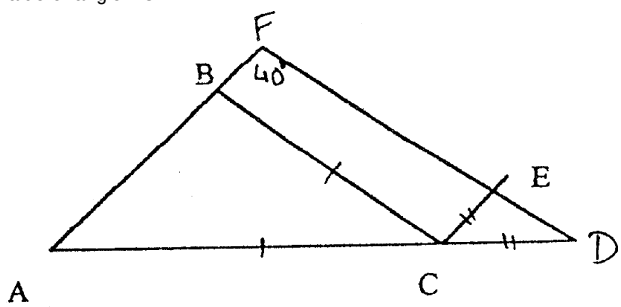
What is the area of the plot?

(*a*) 768 (*b*) 534
(*c*) 696.5 (*d*) 684

38. Ashish is given Rs 158 in one rupee denomination. 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

39. In the given figure BC = AC, angle AFD = 40° and CE = CD. The value of angle BCE = ?



(*a*) 140 (*b*) 70
(*c*) 100 (*d*) None of these

40. For a Fibonacci sequence, from the third term onwards, each term in the sequence is the sum of the previous two terms in that sequence. If the difference of squares of seventh and sixth terms of this sequence is 517, what is the tenth term of this sequence?

(*a*) 147 (*b*) 76
(*c*) 123 (*d*) Cannot be determined

41. In some code, letters a, b, c, d and e represents numbers 2, 4, 5, 6 and 10. We don't know which letter represents which number. Consider the following relationships:

(*i*) a + c = e (*ii*) b – d = d and (*iii*) e = a = b

Which statement below is true?

(*a*) b = 4, d = 2 (*b*) a = 4, e = 6
(*c*) b = 6, e = 2 (*d*) a = 4, c = 6

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

(*a*) $\frac{7}{3}$ (*b*) $\frac{4}{3}$ (*c*) $\frac{5}{3}$ (*d*) $\frac{8}{3}$

43. 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 six 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

44. What is the minimum value of x for which the expression $x^3 - 7x^2 + 11x - 5$ gives positive values?

(*a*) 5 (*b*) 8
(*c*) 4 (*d*) None of these

45. A rectangular pool 20 meters wide and 60 meters long is surrounded by a walkway of uniform width. If the total area of the walkway is 516 square meters, how wide, in meters, is the walkway?

(*a*) 43 (*b*) 4.3
(*c*) 3 (*d*) 3.5

46. December 9, 2001 is Sunday. What was the day on December 9, 1971?

(*a*) Thursday (*b*) Wednesday
(*c*) Saturday (*d*) Sunday

47. Let b be a positive integer and $a = b^2 - b$. If $b \geq 4$, then $a^2 - 2a$ is divisible by:

(*a*) 15 (*b*) 20
(*c*) 24 (*d*) None of these

48. 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

49. A change making machine contains 1 rupee, 2 rupee and 5 rupee coins. The total number of coins is 300. The amount is Rs 960. If the number of 1 rupee coins and the number of 2 rupee coins are interchanged, the value comes down by Rs 40. The total number of 5 rupee coins is:

(*a*) 100 (*b*) 140
(*c*) 60 (*d*) 150

50. Let x, y be two positive numbers such that $x + y = 1$. Then, the minimum value of $(\frac{x+1}{x})^2 + (\frac{y+1}{y})^2$ is:

(*a*) 12 (*b*) 20
(*c*) 12.5 (*d*) 13.3

SECTION—2

No. of Questions: 50

Direction for questions 51 to 80: *Each of the six passages given below is followed by questions. Choose the best answer for each question.*

PASSAGE—I

The narrative of Dersu Uzala is divided into two major sections, set in 1902 and 1907, that deal with separate expeditions which Areseniev conducts into the Ussuri region. In addition, a third time frame forms a prologue to the film. Each of the temporal frames has a different focus, and by shifting them Kurosawa is able to describe the encroachment of settlements upon the wilderness and the consequent erosion of Dersu's way of life. As the film opens, that erosion has already begun. The first image is a long shot of a huge forest, the trees piled upon one another by the effects of the telephoto lens so that the landscape becomes an abstraction and appears like a huge curtain of green. A title informs us that the year is 1910. This is as close into the century as Kurosawa will go. After this prologue, the events of the film will transpire even farther back in time and will be represented as Arseniev's recollections.

The character of Dersu Uzala is the heart of the film, his life the example that Kurosawa wishes to affirm. Yet the formal organisation of the film works to contain, to close, to circumscribe that life by erecting a series of obstacles around it. The file itself is circular, opening and closing by Dersu's grave, thus sealing off the character from the modern world to which Kurosawa once so desperately wanted to speak. the multiple time frames also work to maintain a separation between Dersu and the contemporary world. We must go back farther even than 1910 to discover who he was. But this narrative structure has yet another implication. It safeguards Dersu's example, inoculates it from contamination with history, and protects it from contact with the industrialised, urban world. Time is organised by the narrative into a series of barriers, which enclose Dersu in a kind of vacuum chamber, protecting him from the social and historical dialectics that destroyed the other Kurosawa heroes. Within the film, Dersu does die, but the narrative structure attempts to immortalise him and his example, as Dersu passes from history into myth.

We see all this at work in the enormously evocative prologue. The camera tilts down to reveal felled trees littering the landscape and an abundance of construction. Roads and houses outline the settlement that is being built; Kurosawa cuts to a medium shot of Arseniev standing in the midst of the clearing, looking uncomfortable and disoriented. A man passing in a wagon asks him what he is doing, and the explorer says he is looking for a grave. The driver replies that no one has died here, the settlement is too recent. These words enunciate the temporal rupture that the film studies. It is the beginning of things (industrial society) and the end of things (the forest), the commencement of one world so young that no one has had time yet to die and the eclipse of another, in which Dersu has died. It is his grave for which the explorer searches. His passing symbolises the new order, the development that now surrounds Arseniev. The explorer says he buried his friend three years ago, next to huge cedar and fir trees, but now they are all gone. The man on the wagon replies they were probable chopped down when the settlement was built, and he drives off.

Arseniev walks to a barren, treeless spot next to a pile of bricks. As he moves, the camera tracks and pans to follow, revealing a line of freshly built houses and a woman hanging her laundry to dry. A distant train whistle is heard, and the sounds of construction in the clearing vie with the cries of birds and the rustle of wind in the trees. Arseniev pauses, looks around for the grave that once was, and murmurs desolately, "Dersu". The image now cuts farther into the past, to 1902, and the first section of the film commences, which describes Arseniev's meeting with Dersu and their friendship. Kurosawa defines the world of the film initially upon a void, a missing presence. The grave is gone, brushed aside by a world rushing into modernism, and now the hunter exists only in Arseniev's memories. The hallucinatory dreams and visions of Dodeskaden are succeeded by nostalgic, melancholy ruminations. Yet by exploring these ruminations, the film celebrates the timelessness of Dersu's widom.

The first section of the film has two purposes: to describe the magnificence and inhuman vastness of nature and to delineate the code of ethics by which Dersu lives and which permits him to survive in these conditions. When Dersu first appears, the other soldiers treat him with condescension and laughter, but Arseniev watches him closely and does not share their derisive response. Unlike them, he is capable of immediately grasping Dersu's extraordinary qualities. In camp, Kurosawa frames Arseniev by himself, sitting on the other side of the fire from his soldiers. While they

sleep or joke among themselves, he writes in his diary and Kurosawa cuts in several point-of-view shots from his perspective of trees that appear animated and sinister as the fire light dances across their gnarled, leafless outlines. This reflective dimension, this sensitivity to the spirituality of nature, distinguishes him from the others and forms the basis of his receptivity to Dersu and their friendship. It makes him a fit pupil for the hunter.

51. According to the author the section of the film following the prologue:
(*a*) serves to highlight the difficulties that Dersu faces that eventually kills him.
(*b*) shows the difference in thinking between Arseniev and Dersu.
(*c*) shows the code by which Dersu lives that allows him to survive his surroundings.
(*d*) serves to criticise the lack of understanding of nature in the pre-modern era.

52. Arseniev's search for Dersu's grave:
(*a*) is part of the beginning of the film.
(*b*) symbolises the end of the industrial society.
(*c*) is misguided since the settlement is too new.
(*d*) symbolises the rediscovery of modernity.

53. In the film, Kurosawa hints at Arseniev's reflective and sensitive nature:
(*a*) by showing him as not being derisive towards Dersu, unlike other soldiers.
(*b*) by showing him as being aloof from other soldiers.
(*c*) through shots of Arseniev writing his diary, framed by trees.
(*d*) all of the above.

54. The film celebrates Dersu's wisdom:
(*a*) by exhibiting the moral vacuum of the pre-modern world.
(*b*) by turning him into a mythical figure.
(*c*) through hallucinatory dreams and visions.
(*d*) through Arseniev's nostalgic, melancholy ruminations.

55. How is Kurosawa able to show the erosion of Dersu's way of life?
(*a*) by documenting the ebb and flow of modernisation.
(*b*) by going back farther and farther in time.
(*c*) by using three different time frames and shifting them.
(*d*) through his death in a distant time.

56. According to the author, which of these statements about the film are correct?
(*a*) The film makes its arguments circuitously.
(*b*) The film highlights the insularity of Arseniev.
(*c*) The film begins with the absence of its main protagonist.
(*d*) None of the above.

PASSAGE—II

Billie Holiday died a few weeks ago. I have been unable until now to write about her, but since she will survive many who receive longer obituaries, a short delay in one small appreciation will not harm her or us. When she died we—the musicians, critics, all who were ever transfixed by the most heart-rending voice of the past generation—grieved bitterly. There was no reason to. Few people pursued self-destruction more whole-heartedly, and when the pursuit was at an end, at the age of forty-four, she had turned herself into a physical and artistic wreck. Some of us tried gallantly to pretend otherwise, taking comfort in the occasional moments when she still sounded like a ravaged echo of her greatness. Others had not even the heart to see and listen any more. We preferred to stay home and, if old and lucky enough to own the incomparable records of her heyday from 1937 to 1946, many of which are not even available on British LP to recreate those coarse-textured, sinuous, sensual and unbearable sad noises which gave her a sure corner of immortality. Her physical death called, if anything, for relief rather than sorrow. What sort of middle age would she have faced without the voice to earn money for her drinks and fixes, without the looks—and in her day she was hauntingly beautiful—to attract the men she needed, without business sense, without anything but the disinterested worship of ageing men who had heard and seen her in her glory?

And yet, irrational though it is, our grief expressed Billie Holiday's art, that of a woman for whom one must be sorry. The great blues singers, to whom she may be justly compared, played their game from strength. Lionesses, though often wounded (did not Bessie Smith call herself 'a tiger, ready to jump'?), their tragic equivalents were Cleopatra and Phaedra; Holiday's was an embittered Ophelia. She was the Puccini heroine among blues singers, or rather among jazz singers, for though she sang a cabaret version of the blues incomparably, her natural idiom was the pop song. Her unique achievement was to have twisted this into a genuine expression of the major passions by means of a total disregard of its sugary tunes, or indeed of any tune other than her own few delicately crying elongated notes, phrased like Bessie Smith or Louis Armstrong in sackcloth, sung in a thin, gritty, haunting voice whose natural mood was an unresigned and voluptuous welcome for the pains of love. Nobody has sung, or will sing. Bessie's songs as she did. It was this combination of bitterness and physical submission, as of someone lying still while watching his legs being amputated, which gives such a blood-curdling quality to her song, *Fruit,* the anti-lynching poem which she turned into an unforgettable art song. Suffering was her profession; but she did not accept it.

Little need be said about her horrifying life, which she described with emotional, though hardly with factual, truth in her autobiography *Lady Sings the Blues.* After an adolescence in which self-respect was measured by a girl's insistence in picking up the coins thrown to her by clients with her hands, she was plainly beyond help. She did not lack it, for she had the flair and scrupulous honesty of John Hammond to launch her, the best musician of the 1930s to accompany her—notably Teddy Wilson, Frankie Newton and Lester Young—the boundless devotion of all serious connoisseurs, and much public success. It was too late to arrest a career of systematic embittered self-immolation. To be born with both beauty and self-respect in the Negro ghetto of Baltimore in 1915 was too much of a handicap, even without rape at the age of ten and drug-addiction in her teens. But while she destroyed herself, she sang, unmelodious, profound and heartbreaking. It is impossible not to weep for her, or not to hate the world which made her what she was.

57. According to the passage, Billie Holiday was fortunate in all but one of the following ways:
(*a*) she was fortunate to have been picked up young by an honest producer.
(*b*) she was fortunate to have the likes of Louis Armstrong and Bessie Smith accompany her.
(*c*) she was fortunate to possess the looks.
(*d*) she enjoyed success among the public and connoisseurs.

58. According to the author, if Billie Holiday had not died in her middle age:
(*a*) she would have gone on to make a further mark.
(*b*) she would have become even richer than what she was when she died.
(*c*) she would have led a rather ravaged existence.
(*d*) she would have led a rather comfortable existence.

59. Why will Billie Holiday survive many who receive longer obituaries?
(*a*) because of her blues creations.
(*b*) because she was not as self-destructive as some other blues exponents.
(*c*) because of her smooth and mellow voice.
(*d*) because of the expression of anger in her songs.

60. Which of the following statements is not representative of the author's opinion?

(*a*) Billie Holiday had her unique brand of melody

(*b*) Billie Holiday's voice can be compared to other singers' in certain ways.

(*c*) Billie Holiday's voice had a ring of profound sorrow.

(*d*) Billie Holiday welcomed suffering in her profession and in her life.

ANSWERS

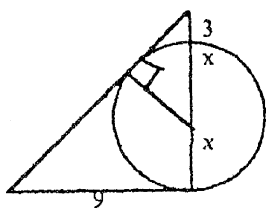
SECTION—1

1. (*a*) Mistake in constant term implies that the sum $(\alpha+\beta) = -\frac{b}{a}$ is correct. Hence $\alpha+\beta = 7$. Secondly mistake in coefficient of x means that the product was correct. Hence $\alpha\beta = 6$. Only choice (*a*) satisfies both these conditions.

2. (*d*) The Pythagorean triplet 8, 15, 17 satisfies the given condition. If the ladder is moved away by 2, it would rest at the foot of the wall.

3. (*c*) Total marks = 6x + 7x + 8x + 10x = 40x. This was equal of 60% of 5y, if y are the total marks in each subject.
Hence $40x = 0.6 \times 5y = \frac{40}{3} = 13.33x$.
The number of papers in which he can receive 50% marks = 4. [Only when x = 4 is y > 50].

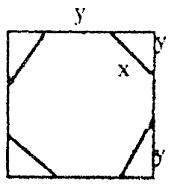
4. (*b*)



The best way to do this sum is to use Pythagoras and work from the choices. Taking choice (*b*) we get $12^2 + 9^2 = 144 + 81 = 225$, hence hypotenuse is 15. To check the answer, put x = 4.5 and see in the upper triangle whether the relationship holds.

5. (*a*) (x – z) = odd – even = odd; y = odd. Odd × odd will always give odd, hence the first statement is wrong.

6. (*b*)



We have $x^2 = y^2 + y^2 = 2y^2$ and 2y + x = 2 (side of square).
From (1), $y = \frac{x}{\sqrt{2}}$ which is $\frac{\sqrt{2x}}{2}$.

Then substitute second equation to get $\sqrt{2x} + x = 2$;

Hence $x = \frac{2}{(\sqrt{2}+1)}$

7. (*c*) Sum of rational numbers = $\frac{n(n+1)}{2} < 1000$.

We get $n^2 + n < 2000$; hence n = 44

Since $44^2 + 44 = 1936 + 44 = 1980$. $\frac{(n^2+n)}{2} = \frac{1980}{2} = 990$.

Hence the number added twice = 1000 – 990 = 10.

8. (*c*) Substitute possible figures in the given choices. In choice (*a*) x can be 2.9 and y can be – 6.9. In choice (*c*) this becomes 5(xy) which is less than x^2y.

9. (*d*) 484 = 2124. If the base of conversion is a; we get $2a^3 + a^2 + 2a + 4 = 484$, hence a = 6.
Converting 3111 from base 6, we get
$3 \times 6^3 + 6^2 + 6^1 + 6^0 = 648 + 36 + 6 + 1 = 691$.

10. (*b*) A does 120, B gets 120 × 1.2 = 144
He gets 144 $(\frac{3600}{12}) = 4320$

C should get 96 × 30 = 2880

11. (*b*) Time taken for the journey = $\frac{200}{60} = \frac{10}{3}$ hrs.

Litres consumed = $\frac{10}{3} \times 4 = \frac{40}{3} = 13.33$

12. (*b*) At 40 km/hr, she spends $\frac{200}{40}$ = 5 hrs and thereby consumes 5 × 2.4 = 12.0 litres.

At 80 km/hr she spends $\frac{200}{80} = 2.5$ litres and consumes 2.5 × 7.9 = 19 litres. Hence she must reduce the speed.

13. (*d*) Visual question. Notice that the difference between BA and MBA is in the denominator. Since the denominator in MBA_2 is higher, it implies that this quantity must be smaller. But MBA_1 could be greater than MBA_2 but less than BA. Hence statement (*d*) is correct.

14. (*b*) Supposing he plays 10 matches and BA = 50.
Then $MBA_2 = \frac{(500+45)}{11} = \frac{545}{11} = 49.5$, hence MBA_2 will decrease.

15. (*b*) The number of boxes containing same number of oranges will be least when there are maximum boxes containing different number of oranges.

16. (*c*) We derive the table as follows:

	Male	Female
Chota Hazri	$\frac{11264}{2}$ = 5632	14174 – 2910 = 11264
Mota Hazri	14174 – 4020 = 10154	14174

17. (*d*) Substitute some values, say x = 6 and y = – 2.
Then all the given choices are wrong.

18. (*a*) ABCF, ABF, ABEF, ABDCF, ABDEF, ADCF, ADCEF, ADEF, ADEF.

19. (*b*) Distance travelled = A : x, B : x – 12, C : x – 18.
When B goes x, C goes $\frac{(x-18)}{x} \times x = x - 8$. Solve x for runner.

20. (*a*) Use the formula of area of triangle
$A = \sqrt{s(s-a)(s-b)(s-c)}$ (s – c) where $s = \frac{(a+b+c)}{2}$.

Substitute a = 20, b = 10 to get the value of c.

21. (*a*) Time taken to cover 60 km by train Y = $\frac{60}{50}$ = 1 hr 12 min.

Rest = 15 min. Total time = 1 hr 27 min.
Distance from A of train X = 100 km approx.
Remaining distance = 180 – (100 + 60) = 20 km.

Time taken to meet = $[\frac{\text{Distance}}{\text{Relative Speed}}] = \frac{20}{120} = \frac{1}{6}$ hr.

Distance from A = $70 \times \frac{1}{6}$ = 11 approx.

Total distance = 100 + 11 = 111 km

22. (*d*) The number of mints must be divisible by 3.
23. (*c*) We do not have any data about the earlier savings.
24. (*c*) The minimum value will occur when a = b = c = d = 1.
25. (*d*) The new product must be a multiple of 53. Only one choice fulfils this requirement.
26. (*a*)
27. (*d*) Total of (x – 1) numbers = $\frac{602}{17}$.

This means x – 1 = 17 and x = 18.
Hence x = 612. Number erased = 10.

28. (*c*) The number can end in multiples of 4, that is 12, 16, 24, 36, 32, 52, 56, 64 = 8 cases.
The first three positions can be filled by 4 × 3 × 2 = 24 ways.
Hence total number of ways = 24 × 8 = 192 ways.
29. (*b*) Taking x and y, we get $\frac{(83x+76y)}{(x+y)} = 79$; and taking y and z we get $\frac{(76y + 85z)}{(y+z)} = 81$.

From (*a*), 83x + 76y = 79x + 79y, hence 4x = 3y.
From (*b*), 76y + 85z = 81y + 81z, hence 5y = 4z.
Average for all the classes = $\frac{(83\times3+76\times4+85\times5)}{2} = 815$

30. (*a*) Since height is the same, area of ΔCEF = $\frac{1}{3}$ of ΔABC

Hence it is $\frac{1}{6}$ of the rectangle.

31. (*a*) We get 3x + 7y + z = 120 and 4x + 10y + z = 164.50.
Subtracting, we get x + 3y = 44.50 or 2x + 6y = 89.
Substitute in first equation to get x + y + z = 120 – 89 = 31.
32. (*d*) Work from the choices.

A + D = $\frac{1}{4}+\frac{1}{32}=\frac{9}{32}$

B + C = $\frac{1}{8}+\frac{1}{16}=\frac{3}{16}$ and $\frac{9}{32}\times\frac{2}{3}=\frac{3}{16}$

33. (*a*) We use hit and trial to solve this sum. Taking the first choice, we can get the number 1854, which satisfies all conditions.
34. (*d*) Let x be the number already contacted.
Then amount collected is 600 x.

As this is 75% of the sum, the total sum is 600x × $\frac{4}{3}$ = 800 x.

Balance amount 200x has to be collected from 40%,
Hence $\frac{200x}{0.4x} = 500$.

35. (*d*) 20% of A : 30% of B : 25% of C = 4 : 9 : 10.
Solve to get the answer.
36. (a) Red light = $\frac{60}{3}$ = 20 sec and green light = $\frac{120}{5}$ = 24 sec.

They will flash together in 120 sec (LCM of 20 and 24); *i.e.* 2 min.

No. of times they flash in an hour = $\frac{60}{2}$ = 30.

37. (*d*) Area of right angled triangle = $\frac{1}{2}$ (24) (32) = 384 units and area of isosceles triangle with sides 25, 25, 40 = 300.
Total area = 300 + 384 = 684 units.
38. (*b*) The coins should be put as follows: 1, 2, 4, 8, 16, 32, 64, 1, 2, 4, 8, 16, and hence he can meet all denominations.
Hence 12 bags.
39. (*c*) Let angle A = a, E = a, F = b, B = b.
Then a + b = 140, since D = 40.
Taking the quadrilateral ABCD,
$\angle$ACB = 360 – [40 + 180 – a + 180 – b] = – 40 + a + b = 100.
40. (*c*) $a^2 - b^2 = 517 = 11 \times 47$. (a + b) (a – b).
Sum of terms is 47 and difference of terms is 11.
Hence x + x + 11 = 47, and the two terms are 18 and 29.
Hence 8th term = 47, 9th term = 47 + 29 = 76 and 10th term = 76 + 47 = 123.
41. (*b*) We get a = 4, c = 2, e = 6; b = c + a = 6 + 4 = 10 and b – d = d is given by 10 – 5 = 5.
42. (*d*) $\frac{12}{(x+a)} - 6 = \frac{12}{(x-a)}$; and $\frac{12}{(2x+a)} \quad 1 = \frac{12}{(2x-a)}$.
43. (*a*) X $\rightarrow$ a = 300, d = 30, t = 10;
s = 5(600 + 9 × 30 × 12) = 870 × 5 × 12 = 52,200.
Y $\rightarrow$ a = 200, d = 15, t = 20; s = 10(400 + 19 × 15) × 6 = 41,100.
Total amount = 52,200 + 41,100 = 93,300
44. (*b*)
45. (*c*) Outer area = (60 + 2x) (20 + 2x) and inner area = 60 × 20 = 1200.
Then, (60 + 2x) (20 + 2x) – 1200 = 516.
Solving the equations, we get x = 3.
46. (*d*) 1971—2001 = 30 years including 8 leap years.

No of odd days = 38; hence $\frac{38}{7}$, remainder = 3.

Sunday – 3 = Thursday.

47. (*c*) $a = b^2 - b$ and $b \geq 4$.
Substitute some values to get b = 4, 5, 6 .....
Hence a = 12, 20, 30 .....
In each case, $a^2 - 2a$ is divisible by 24.
48. (*c*) In 20 kg fresh grapes, 18 kg is water and 2 kg is dried grapes.
But these must contain 20% of water of total weight.

Hence $\frac{2}{0.8}$ = 2.5 kg.

49. (*b*) We get 3 equations: x + y + z = 300, x + 2y + 5z = 960, 2x + y + 5z = 920.
Subtract 1) from 2) and 3) to get:
3x + 3y + 10z = 1880 and 3x + 3y + 3z = 900; 7z = 980
Hence z = 140.
50. (*c*) The minimum value will occur when x = y = $\frac{1}{2}$.

The value of the expression thus is: $(2.5)^2 + (2.5)^2 = 12.5$.

SECTION—2

51. (*d*) The film is about the present, in which forests are cut, juxtaposed with the pre-modern era, which showed an understanding with nature.
52. (*a*) The film opens with Arseniev searching for Dersu's grave.
53. (*d*) All the choices show Arseniev's reflective nature.
54. (*d*) The story is told through Arseniev's nostalgic memories.
55. (*c*) This is explained right in the first paragraph.
56. (*c*) Dersu is already dead when the film opens.
57. (*c*) It is mentioned in the last para that her beauty and self-respect was too much of a handicap.
58. (*c*) Her physical death called for relief (first para).
59. (*a*) The "most heart-rending voice of the past generation".
60. (*d*) Though she pursued self-destruction, it cannot be said that she welcomed suffering.

(Balance Questions alongwith answers will appear in June 2002 issue.)