

Test Booklet Serial Number

--

INSTRUCTIONS

1. Before the test:

1. DO NOT REMOVE THE SEALS OF THE PLASTIC ENVELOPE OF THIS BOOKLET UNTIL THE SIGNAL TO START IS GIVEN.
2. Keep only t Admit Card, pencil, eraser and sharpener with you. DO NOT KEEP with you books, rulers, slide rulers, drawing instruments, calculators (including watch calculators), pagers, cellular phones, stop watches or any other device or loose paper. These should be left at a place indicated by the invigilator.
3. Use only HB pencil to fill in the Answer sheet.
4. Enter in your Answer Sheet: (a) in Box 3, t Test Form Number that appears at the bottom of this page, (b) in Box 4, the Test Booklet Serial Number that appears at the top of this page.
5. Ensure that your personal data have been entered correctly on Side – II of the Answer sheet.
6. Ensure that you have entered your 7-digit Test Registration Number in Box 2 of the Answer sheet correctly.

At the start of the Test:

1. As soon as the signal to start is given, open the Test Booklet.
2. This Test Booklet contains 36 pages, including the blank ones. Immediately after opening the Test Booklet, verify that all the pages are printed properly and are in order. If there is a problem with your Test Booklet, immediately inform the invigilator. You will be provided with a replacement.

How to answer:

1. This test contains **150** questions in three sections. **There are 50 questions in Section I, 50 questions in Section II and 50 questions in Section III.** You have two hours to complete the test. In distributing the time over the three sections, please bear in mind that you need to demonstrate your competence in all three sections.
2. Directions for answering the questions are given before each group of questions. Read these directions carefully and answer the questions by darkening the appropriate circles on the Answer Sheet. Each question has only one correct answer.
3. **Each question carries 1 mark. Each wrong answer will attract a penalty of one-third of the marks allotted to that question.**
4. Do your rough work only on the Test Booklet and Not on the Answer Sheet.
5. Follow the instructions of the invigilator. Candidates found violating the instructions will be disqualified.

After the Test:

1. At the end of the test, remain seated. The invigilator will collect the Answer Sheet from your seat. Do not leave the hall until the invigilator announces “You may leave now”. The invigilator will make the announcement only after collecting the Answer Sheets from all the candidates in the room.
2. You may retain this Test Booklet with you.

20. 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 this 24 miles 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?

(1) $\frac{7}{3}$

(2) $\frac{4}{3}$

(3) $\frac{5}{3}$

(4) $\frac{8}{3}$

21. 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?

(1) 11264

(2) 14174

(3) 5632

(4) 10154

22. 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 students 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 three classes?

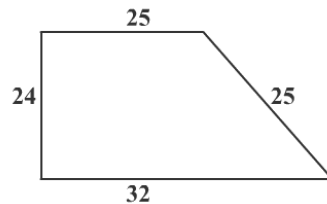
(1) 81

(2) 81.5

(3) 82

(4) 84.5

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



What is the area of the plot?

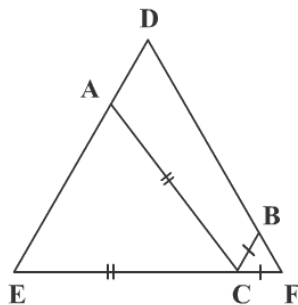
(1) 768

(2) 534

(3) 696.5

(4) 684

30. 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 in squares of seventh and sixth terms of this sequence is 517, what is the tenth term of this sequence?
- (1) 147 (2) 76 (3) 123 (4) Cannot be determined
31. Fresh grapes contain 90% water by weight while dry grapes contain 20% water by weight. What is the weight of dry grapes available from 20kg of fresh grapes?
- (1) 2 kg (2) 2.4 kg (3) 2.5 kg (4) None of these
32. 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 11.00 a.m. for station B, which is 180 km away. Another train Y departs from station B at 11.00 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 kms/hr, but has to stop for 15 minutes at station C, which is 60 kms away from station B enroute to station A. Ignoring the lengths of the trains, what is the distance, to the nearest km, from station A to point where the trains cross other?
- (1) 112 (2) 118 (3) 120 (4) None of these
33. 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?
- (1) 7 (2) 8 (3) 9 (4) None of these
34. In triangle DEF shown below, points A, B, and C are taken on DE, DF and EF respectively such that EC = AC and CF = BC. If angle D = 40 degrees, then what is angle ACB in degrees?



- (1) 140 (2) 70 (3) 100 (4) None of these

35. 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 a second up-down cycle the painting was sold for Rs. 1944.81. What was the original price of the painting?

- (1) Rs.2756.25 (2) Rs.2256.25 (3) Rs.2500 (4) Rs.2000

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

- (1) 36 metres (2) 48 metres (3) 60 metres (4) 72 metres

37. Let x, y be two positive numbers such that $x + y = 1$. Then, the minimum value of

$$\left(x + \frac{1}{x}\right)^2 + \left(y + \frac{1}{y}\right)^2 \text{ is } \underline{\hspace{2cm}}.$$

- (1) 12 (2) 20 (3) 12.5 (4) 13.3

DIRECTIONS for questions 38 and 39: Answer the following questions based on the information given below:

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

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

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

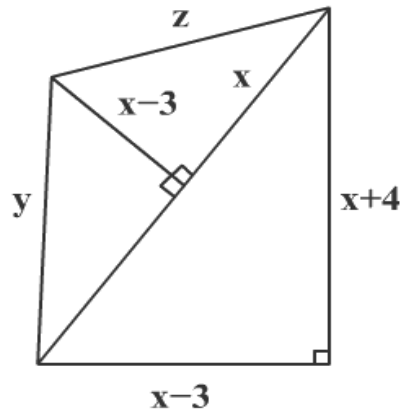
38. Based on the information provided which of the following is true?

- (1) $MBA_1 \leq BA \leq MBA_2$ (2) $BA \leq MBA_2 \leq MBA_1$
(3) $MBA_2 \leq BA \leq MBA_1$ (4) None of these

39. 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:
- (1) BA and MBA_1 will both increase
 - (2) BA will increase and MBA_2 will decrease
 - (3) BA will increase and not enough data is available to assess change in MBA_1 and MBA_2
 - (4) None of these

DIRECTIONS for questions 40 to 48: Choose the best alternative.

40. Based on the figure below, what is the value of x , if $y = 10$?



- (1) 0
 - (2) 11
 - (3) 12
 - (4) None of these
41. A rectangular pool 20 metres wide and 60 metres long is surrounded by a walkway of uniform width. If the total area of the walkway is 516 square metres, how wide, in metres, is the walkway?
- (1) 43
 - (2) 4.3
 - (3) 3
 - (4) 3.5
42. Let b be a positive integer and $a = b^2 - b$. If $b \geq 4$, then $a^2 - 2a$ is divisible by _____.
- (1) 15
 - (2) 20
 - (3) 24
 - (4) None of these
43. 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?
- (1) 11
 - (2) 12
 - (3) 13
 - (4) None of these

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

(i) $a + c = e$, (ii) $b - d = d$ (iii) $e + a = b$

Which statement below is true?

- (1) $b = 4, d = 2$ (2) $a = 4, e = 6$ (3) $b = 6, e = 2$ (4) $a = 4, c = 6$

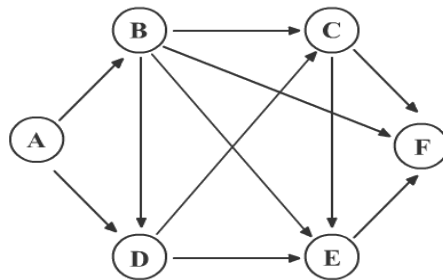
45. Ujakar and Keshab attempted to solve a quadratic equation. Ujakar made a mistake in writing down the constant term. He ended up with the roots (4, 3). Keshab made a mistake in writing down the coefficient of x. He got the root as (3, 2). What will be the exact roots of the original quadratic equation?

- (1) (6, 1) (2) (-3, -4) (3) (4, 3) (4) (-4, -3)

46. 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

- (1) 100 (2) 140 (3) 60 (4) 150

47. 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?

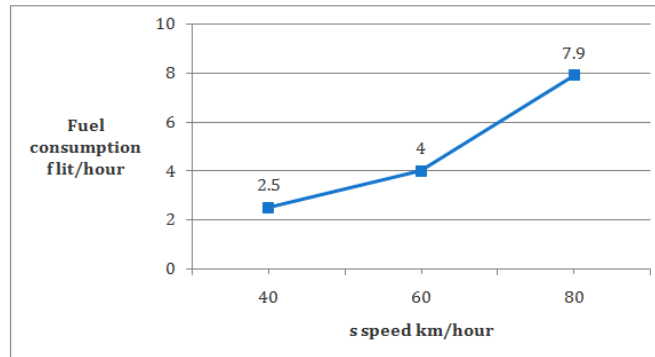


- (1) 9 (2) 10 (3) 11 (4) None of these

48. Let n be the number of different 5 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?

- (1) 144 (2) 168 (3) 192 (4) None of these

DIRECTIONS for questions 49 and 50: Answer the following questions based on the information given below. The petrol consumption rate of a new model car 'Palto' depends on its speed and may be described by the graph below



- 49.** Manasa makes the 200 km trip Mumbai to Pune at a steady speed of 60 km per hour. What is the amount of petrol consumed for the journey?
- (1) 12.5 litres (2) 13.33 litres (3) 16 litres (4) 19.75 litres
- 50.** Manasa would like to minimize the fuel consumption for the trip by driving at the appropriate speed. How should she change the speed?
- (1) Increase the speed (2) Decrease the speed
(3) Maintain the speed at 60 km/hour (4) Cannot be determined

