



INSTITUTE OF MATHEMATICS EDUCATION

MATHS APTITUDE TEST – 2024 (Higher Primary Level)

Std. : VII and VIII

Question Paper

Date : 31.08.2024

Time : 2 Hours

Total Marks : 100

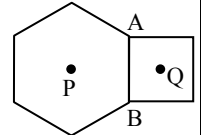
Instructions : 1) Use separate answer sheet to mark answers. 2) First read question carefully, get the answer and darken the circle of respective correct alternative on answer sheet. 3) **No change is allowed, so think twice and then darken the appropriate circle.** 4) Note that half circle darkened or more than one circle darkened, cross or tick on the circle, will not be given marks. 5) If questions are not attempted, marks will not be given. 6) **You can use separate paper for rough work.**

- Q. 1: Convert $31\frac{5}{11}$ into decimal form.
A) 31.45̄ B) 31.45̄ C) 31.45 D) 31.45̄
- Q. 2: Find L.C.M. of 0.04, 0.1, 0.0025
A) 0.2 B) 0.02 C) 0.1 D) 1
- Q. 3: If $\frac{a}{5} = \frac{b}{15} = \frac{c}{20}$, then $\frac{3a + b - c}{a} = ?$
A) 3 B) 2 C) 5 D) 7
- Q. 4: What percent of an hour is 45 seconds?
A) 2.5% B) 1.25% C) 5% D) 3.75%
- Q. 5: If there is a loss of 10% in a transaction, then find the ratio of sell price to cost price.
A) 9:10 B) 10:9 C) 2:5 D) 5:2
- Q. 6: Find compound interest on ₹ 11000 at the rate of 10% per annum for 2 years.
A) ₹2200 B) ₹ 2300 C) ₹ 2130 D) ₹ 2310
- Q. 7: Find average of all numbers from 61 to 89.
A) 76 B) 75 C) 77 D) 75.5
- Q. 8: A train travelling at a speed of 180 km/hr takes 50 seconds to cross a bridge of 2.2 km length. Find the length of the train
A) 220 m B) 250 m C) 300 m D) 350m
- Q. 9: Pipe P fills the tank in one and half hours. Pipe Q takes twice as long as P to fill the same tank. If both the pipes are opened together, then the tank will be filled in how many minutes?
A) 30 B) 45 C) 75 D) 60
- Q. 10: Evaluate: $[(24^2 + 7^2)^{3/2}]^{1/6}$
A) 25 B) 5 C) 75 D) 125
- Q. 11: If $(64)^{1/3} = (0.5)^a$, then $-2a =$
A) 2 B) 4 C) -2 D) -4
- Q. 12: Find the factors of $a^3 - 2a^2 - 5a + 6$
A) $(a-1)(a-2)(a-3)$ B) $(a-1)(a+2)(a-3)$
C) $(a-1)(a+2)(a+3)$ D) $(a+1)(a+2)(a-3)$
- Q. 13: Vikram is elder to Sunil by 6 years. After 18 years, Vikram's age will be twice of Sunil's present age. Find Vikram's present age in years.
A) 24 B) 28 C) 30 D) 36
- Q. 14: Expand $[\sqrt{x} + (1/\sqrt{x})]^2 = ?$
A) $x + \frac{1}{x}$ B) $x + \frac{1}{x} - 1$
C) $x + \frac{1}{x} + 2$ D) $x + \frac{1}{x} + 1$
- Q. 15: In a triangle ABC, point D is on BC such that AD = BD = CD. Find $\angle BAC$.
A) 60° B) 45° C) 90° D) 75°

Q. 16: In a triangle if a measure of one angle is greater than the sum of other two angles, then the triangle is ----- angled

- A) acute B) right
C) obtuse D) equilateral

Q. 17: On a line segment AB = 2024 cm, a square and a regular hexagon are drawn as shown in figure. Find the distance between their centers P and Q.



- A) $1012\sqrt{3}$ B) $1012\sqrt{3} - 1$
C) 1012 D) $1012(\sqrt{3} + 1)$

Q. 18: The perimeter of the right isosceles triangle is 24 cm. Its area in sq. cm is

- A) $144\sqrt{3}$ B) $144(3 + 2\sqrt{2})$
C) $144(3 - 2\sqrt{2})$ D) $144\sqrt{2}$

Q. 19: If the total surface area of a cube is 600 sq.cm, then the length of its diagonal in cm is

- A) 10 B) 20 C) $10\sqrt{3}$ D) $20\sqrt{3}$

Q. 20: In a plane, three lines and a circle are given. The maximum number of points of intersection possible are

- A) 12 B) 11 C) 9 D) 8

Q. 21: The angles of the polygon are in the ratio 2:4:5:6:6:7. The difference between the greatest and the smallest angle of the polygon are

- A) 120° B) 60° C) 45° D) 90°

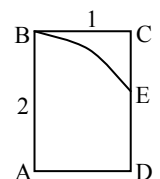
Q. 22: If $x^2 + (1/x^2) = 11$, then $x - (1/x) = ?$

- A) $\sqrt{13}$ B) 3 C) -3 D) ± 3

Q. 23: The length of the rectangular sheet of paper is 33 cm. It is rolled along the length to make a cylinder. The volume of cylinder is 1386 cm^3 . The width of the paper in cm is

- A) 14 B) 16 C) 21 D) 28

Q. 24: Refer figure. ABCD is a rectangle. An arc BE is drawn with AB as radius and center A. Find length CE.



- A) $\sqrt{3}$ B) 1.4
C) 1.6 D) $(2 - \sqrt{3})$

Q.25: Five angles of a 7 sided polygon are 160° , 135° , 175° , 145° , 125° . If remaining 2 angles are of x° each, then $x =$

- A) 45 B) 75 C) 80 D) 60

- Q. 26:** The L.C.M. of 'a' and 140 is 560. The least possible value of a =
A) 28 B) 14 C) 16 D) can't determine
- Q. 27:** A and B have some money. The ratio of amounts of A to B is 0.125:2 and A has ₹400, then the amount with B is
A) ₹1600 B) ₹6400 C) ₹3200 D) ₹ 800
- Q. 28:** Money invested in bank becomes 2 times of itself in 5 years. Then in 15 years it will become how many times of the original amount ?
A) 4 B) 3 C) 8 D) 5
- Q. 29:** Ten dozen apples were purchased at the rate of ₹180 per dozen. However because of transport strike, they were sold at a loss of 10% Find the selling rate per dozen.
A) ₹ 159 B) ₹ 173 C) ₹ 162 D) ₹ 169
- Q. 30:** x, y, z are three sums of money such that y is the simple interest on x and z is the simple interest on y for the same time and rate of interest. Then
A) $x^2 = yz$ B) $y^2 = zx$ C) $z^2 = xy$ D) $y = x + z$
- Q. 31:** If Ajit gets 71 marks in the current examination, then his average will be 83. If he gets 99 marks in the current examination, then his average will be 87. Find how many exams he has already taken.
A) 2 B) 4 C) 6 D) Can't Decide
- Q. 32:** The fraction greater than $8\frac{2}{3}$ among the following is
A) $\frac{115}{15}$ B) $\frac{150}{18}$ C) $\frac{236}{27}$ D) None of these
- Q. 33:** Kiran sells a pen at a profit of 20% for ₹ 60. Due to less demand, he reduces the price of pen to ₹ 55. Now he makes a
(A) profit of 10% (B) loss of 10% (C) profit of 12% (D) loss of 12%
- Q. 34:** a and b are natural numbers. If $9a^2 = 12a + 96$ and $b^2 = 2b + 3$, then $a + b =$
A) 3 B) 7 C) 5 D) 4
- Q. 35:** Five years ago, the average age of 4 persons was 45 years. The fifth person joins them now and then the average age of 5 persons becomes 49 years. Find the present age of the fifth person in years.
A) 49 B) 44 C) 45 D) 46
- Q. 36:** $\left[\frac{A}{2x+3} \right] - \left[\frac{A}{3x-1} \right] = \left[\frac{-11}{(2x+3)(3x-1)} \right]$ for $x = 5$. Then $A^2 - A =$
A) 110 B) -110 C) 132 D) -132
- Q. 37:** $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{n(n+1)} = \frac{19}{20}$, then $n =$
A) 18 B) 19 C) 20 D) 25

- Q. 38:** 'n' is a negative integer. The expression having the least value is
A) $-2n^2 + 2n$ B) $-2n^2 - 2n$ C) $2n^2 + 2n$ D) $2n^2 - 2n$
- Q. 39:** Let $a^2 - b^2 = 2011$, where a and b are integers. The least possible value of (a + b) is
A) -2011 B) -3011 C) -1005 D) -1011
- Q. 40:** For non-zero numbers x and y, the value of the expression $x^2 + xy + y^2$ is always
A) positive B) negative C) 0 D) can't say
- Q. 41:** The students in the class exchange their photos. Each student in the class gives his photo to each of the remaining students and receives photo from all the remaining students. There are total 870 exchanges of photos. Find the number of students in the class.
A) 25 B) 29 C) 30 D) 36
- Q. 42:** There are 5 points on the circumference of a circle. The number of chords which can be drawn joining them
A) 10 B) 6 C) 8 D) 7
- Q. 43:** There are 3 phones A, B, C. The phone A is 50% more costly than C and the phone B is 25% more costly than C. If The phone A is a% more costly than B, then a =
A) 10 B) 15 C) 20 D) 25
- Q. 44:** The sum of 5% of a and 9% of b equals The sum of 8% of a and 7% of b. Then a:b =
A) 3:2 B) 2:3 C) 4:5 D) 5:4
- Q. 45:** The difference in squares of two consecutive numbers is 171. The number of possible pair
A) Infinite B) 1 C) 2 D) 0
- Q. 46:** ABCD is a square where $AB = 1$. Equilateral triangles AYB and CXD are drawn such that X and Y are inside the square. Then $d(XY) =$
A) 0 B) 0.25 C) $\sqrt{3}$ D) $\sqrt{3} - 1$
- Q. 47:** The digit at the unit's place of the given sum is $1 + 6 + 6^2 + \dots + 6^{2015} + 6^{2016}$
(A) 6 (B) 7 (C) 5 (D) 0
- Q. 48:** A man walks from town A to B at a speed of 4 km/hr. He starts 1 hour before a bus starts. The bus moves with a speed of 12 km/hr. The man on his way gets into the bus and travels 2 hours by bus and reaches town B. Find the distance between towns A and B in km.
A) 28 B) 24 C) 30 D) Data insufficient
- Q. 49:** A, B and C offer to do the job. A alone would take 'a' times as many days as B and C working together. B alone would take 'b' times as many days as C and A working together. C alone would take 'c' times as many days as A and B working together. Then $[a/(a+1)] + [b/(b+1)] + [c/(c+1)] =$
A) 2 B) 1 C) 0 D) Can't Determine
- Q. 50:** Suppose that $4^a = 5$, $5^b = 6$, $6^c = 7$, $7^d = 8$. What is the value of the product abcd?
A) 1.5 B) 0 C) 1 D) Can't Determine
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