



INSTITUTE OF MATHEMATICS EDUCATION

MATHS APTITUDE TEST – 2022 (Higher Primary Level)

Std. : VII and VIII

Question Paper

Date : 20.08.2022

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 : Simplify $\left[\frac{2}{9} + \frac{3}{8}\right] \times 4 \frac{4}{17} = ?$

- A) $\frac{5}{17}$ B) 1 C) $\frac{43}{17}$ D) $\frac{46}{40}$

Q.2 : Find G.C.D. of $162 m^2 n^3$ and $36 m^3 n^2$.

- A) $36 m^3 n^2$ B) $36 mn$
C) $18 m^2 n^2$ D) $72 m^2 n^2$

Q.3 : Divide ` 4480 in the ratio 9 : 7. The larger share is

- A) ` 2520 B) ` 5040
C) ` 1960 D) Any other

Q.4 : If P% of P is 196, then P is equal to

- A) 70 B) 140 C) 7 D) 14

Q.5 : The ratio of C.P. to S.P. is 8 : 9, then find percent profit.

- A) $\frac{50}{3}\%$ B) $33\frac{1}{3}\%$ C) 12.5% D) 25%

Q.6 : What will be the ratio of simple interest earned by certain principal at the same rate of interest for 9 years and that for 12 years?

- A) 3 : 4 B) 4 : 3 C) 3 : 2 D) 2 : 3

Q.7 : Find the average of first 20 even natural numbers.

- A) 20 B) 40 C) 41 D) 21

Q.8 : Two trains A and B of lengths 160 m and 170 m are running in opposite direction with same speed of 54 km/hr. Then find the time, trains will take to cross one another.

- A) 22 sec. B) 11 sec. C) 17 sec. D) 15 sec.

Q.9 : 'A' does a work in 15 days and 'B' does the same work in 20 days. In how many days they will do the same work together?

- A) $7\frac{3}{8}$ B) $3\frac{3}{7}$ C) $9\frac{1}{8}$ D) $8\frac{4}{7}$

Q.10 : $\sqrt{0.0225} \div \sqrt{0.0009} = ?$

- A) 5 B) 0.5 C) 50 D) 0.05

Q.11 : $3[(3^a \times 3^b)^{a-b} \times (3^b \times 3^c)^{b-c} \times (3^c \times 3^a)^{c-a}] = ?$

- A) 0 B) 1
C) 3 D) $3^{(a-b)(b-c)(c-a)}$

Q.12 : $\frac{(53+47)^2 + (53-47)^2}{53 \times 53 + 47 \times 47} = ?$

- A) 1 B) 6 C) 100 D) 2

Q.13 : If $\sqrt{\frac{12.1}{x}} = 1.1$, then x = ?

- A) 10 B) 1.21 C) 13.2 D) 13.31

Q.14 : If $\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{5}$, then find $x^2 + \frac{1}{x^2}$.

- A) 6 B) 8 C) 7 D) 9

Q.15 : Find the supplementary angle of angle $68^\circ 45'$.

- A) $21^\circ 15'$ B) $111^\circ 15'$
C) $-21^\circ 15'$ D) $94^\circ 45'$

Q.16 : Angles of a triangle are in the ratio 3 : 4 : 2. Find the measure of the largest angle.

- A) 60° B) 80° C) 40° D) 70°

Q.17 : If the length of diagonal of a square is $2\sqrt{2}$ cm, then perimeter of that square is ____.

- A) $2\sqrt{2}$ cm B) 4 cm C) $4\sqrt{2}$ cm D) 8 cm

Q.18 : If the ratio of perimeter of two equilateral triangle is 3 : 2, then find the ratio of their areas.

- A) 2 : 3 B) 3 : 2 C) 4 : 9 D) 9 : 4

Q.19 : Volume of a cylinder is 243 cu. cm. What is the volume of a cone whose radius and height are the same as that of the cylinder?

- A) 81 cm^3 B) 54 cm^3
C) 243 cm^3 D) Any other

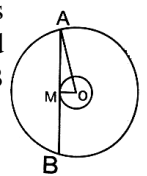
Q.20 : Diameter of wheel of a bicycle is 1.19 m. How much distance will it cover in 6000 revolutions?

- A) 22.44 km B) 2244 km
C) 22440 km D) 2.244 km

Q.21 : If sum of all interior angles of a regular polygon is 1620° , then find the measure of its each exterior angle.

- A) 30° B) 32° C) $(32.72)^\circ$ D) $(32.27)^\circ$

Q.22 : If radius of two concentric circles shown in figure are 7 cm and 25 cm., then length of chord AB is



- A) 36 cm. B) 18 cm
C) 24 cm D) 48 cm

Q.23 : Find L.C.M. of 1.44, 10.8, 0.072.

- A) 0.432 B) 21.6 C) 7.2 D) 10.8

Q.24 : If $\frac{a}{7} = \frac{b}{3}$, then $\frac{a+b}{a-b} = ?$

- A) $\frac{4}{7}$ B) $\frac{5}{7}$ C) $\frac{5}{2}$ D) $\frac{7}{3}$

Q.25 : Let 20% of 50 + 40% of 50 = x% of 150. Find x.

- A) 50 B) 40 C) 20 D) 25

Q.26 : Evaluate: $\left(\frac{1}{5^4} - 5^{-\frac{1}{4}}\right)\left(\frac{1}{5^4} + 5^{-\frac{1}{4}}\right)\left(\frac{1}{5^2} + 5^{-\frac{1}{2}}\right) \times 5$

- A) 20 B) $5\frac{1}{5}$ C) 5 D) 24

Q.27 : The length of hypotenuse of an isosceles right angled triangle is 6 cm. Find its perimeter.

- A) $\sqrt{2} + 1$ B) $6\sqrt{2} + 2$
 C) $6\sqrt{2} + 4$ D) $6(\sqrt{2} + 1)$

Q.28 : How many small cubes with edge 25 cm can be accommodated in a cubical box of edge 1 m?

- A) 64 B) 100 C) 125 D) 128

Q.29 : If difference of two numbers in 4 and their product is 12, then find their sum.

- A) 16 B) 12 C) 8 D) 48

Q.30 : 'A' alone can do certain piece of work in 10 days, 'B' does the same work in 12 days. If A, B and C together can do same work in 4 days, then find how much time is required for C alone to do the work?

- A) 15 days B) 10 days
 C) 12 days D) 18 days

Q.31 : A boat covers certain distance down stream in 2 hrs while it comes back in 2.5 hrs. The speed of stream is 4 km/hr, find speed of boat in still water.

- A) 10.5 km/hr B) 36 km/hr
 C) 16 km/hr D) 15 km/hr

Q.32 : A man travels from A to B with speed of 20 km/hr and returns from B to A with speed of 25 km/hr. What is the average speed of whole journey?

- A) 22.50 km/hr B) 21.22 km/hr
 C) 45 km/hr D) 22.22 km/hr

Q.33 : In ΔABC , angle bisector of $\angle B$ and $\angle C$ intersect each other at point O. If $m \angle BOC = 95^\circ$, then $m \angle A = ?$

- A) 30° B) 40° C) 20° D) 10°

Q.34 : A rectangle has dimensions 25 cm \times 20 cm. If length is decreased by 20%, then what should be the breadth of the rectangle (in cm) so that its area remains same?

- A) 20 B) 12 C) 25 D) 15

Q.35 : The CP of 24 articles is equal to S.P. of 20 articles. Find the gain or loss percent.

- A) 5% gain B) 4% loss
 C) 20% gain D) 20% loss

Q.36 : If difference between SI and CI on `800 for 2 years is 4 times that of rate of interest, then find the rate of interest.

- A) 10 p.c.p.a. B) 12 p.c.p.a.
 C) 25 p.c.p.a. D) 50 p.c.p.a

Q.37 : $\frac{\sqrt[3]{5000} - \sqrt[3]{625}}{\sqrt[3]{135} - \sqrt[3]{8640}} = ?$

- A) $2\sqrt[3]{5}$ B) $3\sqrt{5}$ C) $\frac{-5}{9}$ D) 5

Q.38 : Find the factors of $(\sqrt{x})^4 - 81$

- A) $(x + 3)(x - 3)$
 B) $(x + 9)(x - 6)$
 C) $(\sqrt{x} + 3)(\sqrt{x} - 3)(x + 9)$
 D) $(\sqrt{x} + 9)(\sqrt{x} - 9)$

Q.39 : If $A : B = 3 : 5$ and $B : C = 6 : 7$, then $A : B : C = ?$

- A) 35 : 30 : 77 B) 18 : 30 : 35
 C) 15 : 30 : 35 D) 3 : 30 : 7

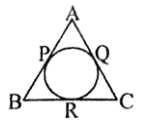
Q.40 : Three numbers are in the ratio 5 : 3 : 2 and their L.C.M. is 150. Find their H.C.F.

- A) 5 B) 7.5 C) 9 D) 15

Q.41 : 10% of 20% of 30% of 1250 = ?

- A) 30.25 B) 7.5 C) 50.50 D) 330

Q.42 : Tangents drawn from points A, B, C touch the circle at points P, Q, R as shown in figure. If $AQ = 5.5$, $CR = 3.5$ and $BP = 4.5$, then find perimeter of ΔABC .



- A) 28 B) 18 C) 10.5 D) 27

Q.43 : If curved surface area of a hemisphere is 2772 cm^2 , then find its volume. $\left(\pi = \frac{22}{7}\right)$

- A) 19404 cm^3 B) 8316 cm^3
 C) 5544 cm^3 D) any other

Q.44 : Find measure of each interior angle of a 20-sided regular polygon.

- A) 30° B) 162° C) 45° D) 72°

Q.45 : If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ and $y = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, then $x - y = ?$

- A) $2\sqrt{5}$ B) $\sqrt{5}$ C) $4\sqrt{6}$ D) $2\sqrt{6}$

Q.46 : A student gets marks in five subjects in the ratio 10 : 9 : 8 : 7 : 6. His average marks of 5 subjects together are 60%. If the passing marks are 50% of the maximum marks and each subject has the same maximum marks, in how many subjects did he pass the examination?

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

Q.47 : In Sivakasi, each boy's quota of match sticks to fill into boxes is not more than 200 per session. If he reduces the number of sticks per box by 25, he can fill 3 more boxes with the total number of sticks assigned to him. Which of the following is the possible number of sticks assigned to each boy per session?

- A) 200 B) 150 C) 125 D) 175

Q.48 : A shopkeeper sells 1 kg rice to two customers Rani and Vani. For Rani he charges exactly the cost price but under weighs the quantity by 10%. For Vani he sells at 20% more than cost price but over weighs the quantity by 10%. What is his overall profit/ loss percentage?

- A) 10% loss B) 10% profit
 C) 9.1% loss D) 9.1% profit

Q.49 : A ship 156 km from the shore springs a leak which admits 2.5 metric tons of water in 7.5 minutes. A quantity of 65 metric tons would suffice to sink it, but the pumps can throw out 15 metric tons in an hour. The average rate of sailing so that it just reaches the shore as it begins to sink should be

- A) 12 kmph B) 60 kmph
 C) 15 kmph D) 10 kmph

Q.50 : Euclid has a triangle in mind. Its longest side has length 20 units, and another of its sides has

length 10 units. Its area is 80 sq. units. What is the length of its third side in units?

A) 15

B) $\sqrt{300}$

C) $\sqrt{260}$

D) Can't decide

