



INSTITUTE OF MATHEMATICS EDUCATION

MATHS APTITUDE TEST – 2022 (Higher Primary Level)

Std. : VII and VIII

Question Paper

Date : 10.09.2022

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 : $55\frac{1}{11} + 55\frac{2}{11} + 55\frac{3}{11} + 55\frac{4}{11} + 55\frac{5}{11} + 55\frac{7}{11} = ?$

- A) 555 B) 550 C) 332 D) 330

Q.2 : Find L.C.M. of $25x^4y^3z^2$ and $33x^2y^3z^4$.

- A) $35x^2y^2z^2$ B) $825x^4y^3z^4$
C) $5x^2y^2z^2$ D) $875x^6y^6z^6$

Q.3 : If $x^2 + y^2 = 2xy$, then $x : y = ?$

- A) 1 : 2 B) 2 : 1 C) 1 : 1 D) 1 : 4

Q.4 : If 75% of x is 112.5, then $x = ?$

- A) 64 B) 150 C) 78 D) 105

Q.5 : If a man incurs 2.5% loss, then what will be ratio of S.P. to C.P.?

- A) 39 : 40 B) 29 : 30 C) 24 : 25 D) 9 : 8

Q.6 : Simple interest on principal of ₹ 2 at 10 p.c.p.a is ₹ 2, then find period in years.

- A) 0.2 B) 2.2 C) 10 D) 2

Q.7 : If average rain fall for first 6 days is 105 mm and last 6 days average is 102 mm, then find the average rain fall for all 12 days in mm.

- A) $103\frac{2}{11}$ B) $103\frac{5}{12}$ C) 109.3 D) 103.5

Q.8 : A train having length of 350m, runs with speed of 63 km/hr. How much time (in seconds) the train will require to cross the signal pole in seconds?

- A) 10 B) 12 C) 15 D) 20

Q.9 : 'A' and 'B' together can complete a piece of work in 6 days. If 'A' alone can complete the same work in 10 days, in how many days can 'B' alone complete that work?

- A) 9 B) 15 C) 21 D) 12

Q.10 : If $\sqrt{27x^2} = \sqrt{675}$ then $x = ?$

- A) 5 B) 9 C) 15 D) $5\sqrt{3}$

Q.11 : If $6^{21.5} + 6^{21.5} + 6^{21.5} + 6^{21.5} + 6^{21.5} + 6^{21.5} = 6^x$, then $x = ?$

- A) 21.5 B) 43 C) 42 D) 22.5

Q.12 : If $a = -101$ and $b = -105$, then find the value of expression $a^3 - 3a^2b + 3ab^2 - b^3$.

- A) -64 B) -16 C) 64 D) 32

Q.13 : If $13^{5-x} = 169^{2x-7.5}$, then find x.

- A) -1 B) 2 C) 3 D) 4

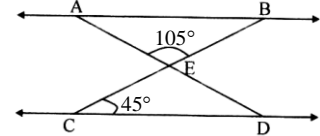
Q.14 : Which of the following is the value of

$$\left(x\frac{3}{2} - x\frac{3}{2}\right)^2 ?$$

- A) $x^2 - x^{-2}$ B) $x^3 - x^{-3}$
C) $x^3 - 2 + x^{-3}$ D) $x^4 - 2 + x\frac{3}{4}$

Q.15 : In the given figure $AB \parallel CD$, $m\angle ECD = 45^\circ$ and $m\angle AEB = 105^\circ$. Find $m\angle BAE$.

- A) 15°
B) 30°
C) 35°
D) 55°



Q.16 : The three angles of a $\triangle ABC$ are $\angle A = (2x)^\circ$, $\angle B = (2x + 20)^\circ$ and $\angle C = (3x - 22)^\circ$. Find the greatest side of the triangle.

- A) BC B) AB
C) AC D) Cannot say

Q.17 : A ladder 40 m long is kept resting on the wall. The bottom of the ladder is 24 m. away from the wall. How high will it reach on the wall?

- A) 42 m B) 40 m C) 38 m D) 32 m

Q.18 : If the perimeter of rectangular field is 120 m. and its length is 32 m, then find its area in sq. m.

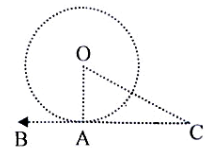
- A) 816 B) 896 C) 81.6 D) 89.6

Q.19 : The ratio of radii of a cone and a cylinder having same height is 5 : 4. Then find the ratio of their volumes.

- A) 25 : 16 B) 5 : 16 C) 25 : 48 D) 5 : 12

Q.20 : Here 'O' is the centre of the circle and line BC is perpendicular to circle at point A. Distance of point 'C' from 'O' is 10 cm and radius of the circle is 8 cm, find A ($\triangle AOC$).

- A) 32 sq. cm
B) 24 sq. cm
C) $12\sqrt{3}$ sq. cm
D) $20\sqrt{3}$ sq. cm



Q.21 : If ratio of interior angle and exterior angle of a regular polygon is 5 : 1, then how many sides does it have?

- A) 12 B) 15 C) 10 D) 8

Q.22 : If the diameter of the wheel is 28 m, then find the distance covered by the wheel in 1000 revolutions in km. ($\pi = 22/7$)

- A) 176 B) 1760 C) 88 D) 8800

Q.23 : Find HCF of $(x^3 + 1)$ and $x^2 - x + 1$

- A) $x + 1$ B) $x^2 + x + 1$
C) $x^2 - x + 1$ D) $x^2 + 1$

Q.24 : What is the mean proportional of $\sqrt{a} + \sqrt{b}$ and $\sqrt{a} - \sqrt{b}$?

- A) $\sqrt{a^2 - b^2}$ B) $a^2 - b^2$
C) $\sqrt{a^2 + b^2}$ D) $\sqrt{a - b}$

Q.25 : What percent of 4.5 meter is 2.7 cm?
A) 6% B) 0.6% C) 60% D) 80%

Q.26 : $(256)^{\frac{3}{4}} \times (1296)^{\frac{1}{4}} = ?$
A) 384 B) 144 C) 24 D) 2304

Q.27 : Difference of two numbers is 12. If one number is three times the other, then find the sum of the numbers.
A) 18 B) 12 C) 36 D) 24

Q.28 : Side of base of regular hexagonal prism is $2\sqrt{3}$ cm. If its height is 10 cm, then find its volume.
A) $15\sqrt{3}$ cu.cm. B) $(15\sqrt{3} + 12)$ cu.cm.
C) 180 cu. cm. D) $180\sqrt{3}$ cu.cm.

Q.29 : If $m - 1 = \sqrt{3}$ and $n + 1 = \sqrt{3}$, then $m^2 - n^2 = ?$
A) $4\sqrt{3}$ B) $2\sqrt{3}$ C) $2 + \sqrt{3}$ D) $-2\sqrt{3}$

Q.30 : A alone can lay railway track in 16 days and B alone can do the same job in 12 days. Working together A, B and C did the job in 4 days only. Then in how many days C alone can do the job?
A) $9\frac{1}{5}$ B) $9\frac{2}{5}$ C) $9\frac{3}{5}$ D) 10

Q.31 : A train starts from Mumbai at 7:15 pm and reaches Delhi at 5:15 pm (next day). If average speed of train is $17\frac{2}{9}$ m/sec, then find distance between Mumbai and Delhi in km.
A) 1532 B) 1364 C) 1500 D) any other

Q.32 : The average of ten consecutive even numbers is 29. Find the highest number.
A) 28 B) 18 C) 38 D) 48

Q.33 : In $\triangle ABC$, $AB = AC$ and the base BC is produced to D and $m\angle ACD = 120^\circ$, then find $\angle A$.
A) 40° B) 80° C) 110° D) 60°

Q.34 : Find the area of regular hexagon in sq. cm. if length of its side is equal to 12 cm.
A) $150\sqrt{3}$ B) $216\sqrt{3}$ C) 600 D) 450

Q.35 : If the loss is $\frac{1}{15}$ of S.P., then what is loss percentage?
A) 10 B) 12 C) 10.5 D) 6.25

Q.36 : The amount by C.I. on ₹ 7000 after 6 months when compound half yearly at a certain rate is ₹ 7350. Find the rate of interest.
A) 2.5% B) 20% C) 10% D) 5%

Q.37 : $[\sqrt[3]{5832} + \sqrt[3]{8000} - \sqrt[3]{8}]^2 = ?$
A) 6 B) $6\sqrt{2}$ C) $2\sqrt[3]{6}$ D) 2

Q.38 : Simplify : $\frac{6a^6 - 12a^5b + 6a^4b^2}{(a-b)^2} = ?$
A) $6a^3$ B) $6a^4$ C) $6a - b$ D) $a - 6b$

Q.39 : Find the ratio of 4 hrs. 30 mins to 2 hrs 45 min.
A) 18 : 11 B) 18 : 15
C) 15 : 11 D) Any other

Q.40 : The ratio of two numbers is 5 : 7 and their H.C.F. is 9, then their L.C.M. is
A) 108 B) 35 C) 45 D) 315

Q.41 : If x % of y = y % of z, then $x - z = ?$
A) 0 B) 1 C) 2 D) 50

Q.42 : PQ is a tangent to the circle at point Q with center R, $PQ = 60$ cm. If point P is at 61 cm from R, then find diameter of the circle.
A) 22 cm. B) 18 cm. C) 11 cm. D) 9 cm

Q.43 : Find total surface area in sq. cm of a cone with base radius 9 cm and height 40 cm. ($\pi = 3.14$)
A) 360 B) 3321 C) 1413 D) 3240

Q.44 : Sum of measures of interior angles of regular polygon is 1800° . Each exterior angle is
A) 144° B) 40° C) 25° D) 30°

Q.45 : Simplify : $\frac{m^2 + 7m + 12}{m^2 - m - 12}$
A) $\frac{m+6}{m-2}$ B) $\frac{m+2}{m+6}$ C) $\frac{m+3}{m-3}$ D) $\frac{m+4}{m-4}$

Q.46 : $\triangle ABC$ has integral sides x, y, z such that $xz = 12$. How many such triangles are possible?
A) 8 B) 6 C) 9 D) 12

Q.47 : A spherical shaped sweet is placed inside a cube of side 5 cm such that the sweet just fits the cube. A fly is sitting on one of the vertices of the cube. What is the shortest distance the fly must travel to reach the sweet?
A) 2.5 cm B) $5(\sqrt{3} - 1)$ cm
C) $5(\sqrt{2} - 1)$ cm D) $2.5(\sqrt{3} - 1)$ cm

Q.48 : A tank is fitted with 8 pipes, some of them that fill the tank and others that are waste pipe meant to empty the tank. Each of the pipes that fill the tank can fill it in 8 hours, while each of those that empty the tank can empty it in 6 hours. If all the pipes are kept open when the tank is full, it will take exactly 6 hours for the tank to empty. How many of these are filling pipes?
A) 2 B) 4 C) 6 D) 5

Q.49 : Suppose we take a date and a month, multiply the date with 12 and the numeral of month with 31 and add up the two products. We get the sum as 555. Find out the date and month.
A) 23rd September B) 17th November
C) 13th October D) Can't determine

Q.50 : $\frac{2}{5}$ th of the voters promise to vote for A and the rest promised to vote for B. Of these, 15% of the voters went back of their promise to vote for A and 25% of voters went back of their promise to vote for B, and A lost by 200 votes. Then, the total number of voters is:
A) 10000 B) 11000 C) 9000 D) 9500

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