10th Maths Sample Model Question Paper

10th Standard

Maths

Date : 29-Nov-22

General Instructions:
1. **This Question paper has 5 Sections A,B,C,D and E.**
2. **Section A has 20 Multiple Choice Questions(MCQs) Carrying 1 Mark Each.**
3. **Section B has 5 Short Answers - I type Questions Carrying 2 Mark Each.**
4. **Section C has 6 Short Answers - II type Questions Carrying 3 Mark Each.**
5. **Section D has 4 Long Answers type Questions Carrying 5 Mark Each.**
6. **Section E - Case Study Questions are Compulsory.**

Reg.No. : ☐☐☐☐☐☐

Exam Time : 02:00:00 Hrs

Total Marks : 80

Section - A

20 x 1 = 20

1) H.C.F. of two consecutive even numbers is:

 (a) 2   (b) 1   (c) 0   (d) 4

2) What is the HCF of 235 and 395?

 (a) 25   (b) 35   (c) 5   (d) 13

3) For some integer m every odd integer is of the form

 (a) 2m   (b) -2m   (c) 2m + 1   (d) m

4) The largest number which divides 70 and 125 leaving remainders 5 and 8, respectively is

 (a) 1750   (b) 15   (c) 63   (d) 13

5) If P = (2)(4)(6)...(20) and Q = (1)(3)(5)...(19),then the HCF of Pand Q is

 (a) $3^3 57$ (b) $3^4 5$ (c) $3^4 5^2 7$ (d) $3^2 5^2$

6)
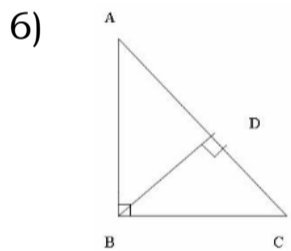
In the above figure, AB = c, BC = a, AC = b, AD = y, DB = p. Check which of the following options is correct?

 (a) cy=ap   (b) ac=by   (c) ay=cp   (d) cy=ab

7) Tick the correct answer and justify : In D ABC, AB = $6\sqrt{3}$ cm, AC = 12 cm and BC = 6 cm. The angle B is :

 (a) 120°   (b) 60°   (c) 90°   (d) 45°

8) If the lengths of the diagonals of rhombus are 16 cm and 12 cm. Then, the length of the sides of the rhombus is

 (a) 9 cm   (b) 10 cm   (c) 8 cm   (d) 20 cm

9) Find the distance of the point (–6, 8) from the origin

 (a) 8   (b) 11   (c) 10   (d) 9

10) The value of for which $2 \cos^2 \theta + b \csc \theta = p$ and $b \cot + a \csc \theta = q$ then $p^2 - q^2$ is equal to

 (a) a^{2+b^2} (b) b^{2+a^2} (c) b^{2-a^2} (d) a^{2-b^2}

11) If $\sin A = \frac{1}{2}$ then the value of cot A is

 (a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{\sqrt{3}}{2}$ (d) 1

12) If $m = a\cos^3\theta + 3a\cos\theta\sin^2\theta$ and $n = a\sin^3\theta + 3a\cos^2\theta\sin\theta$, $(m+n)^{2/3} + (m-n)^{2/3}$ is equal to

 (a) $2a^{2/3}$ (b) $a^{2/3}$ (c) $2a^{3/2}$ (d) $a^{3/2}$

13) A man is standing on the deck of a ship, which is 8 m above water level. He observes the angle of elevation of the top of a hill as 600 and angle of depression of the base of the hill as 300. What is the height of the hill?

(a) 32 m   (b) 24√3 m   (c) 24m   (d) 8√3 m

14) A tower stands vertically on the ground. From a point on the ground 30 m away from the foot of the tower, the angle of elevation of the top of the tower is 45°. The height of the tower will be

(a) 30√3 m   (b) 30 m   (c) 40 m   (d) 40√3 m

15) A tree is broken by the wind. The top struck the ground at an angle of 30° and at a distance of 30 metres from the foot of the tree. The height of the tree in metres is

(a) 35√3   (b) 40√3   (c) 25√3   (d) 30√3

16) A tower stands vertically on the ground from a point on the ground which is 25 m away from the foot of tower if the height of tower is 25√3 metres find the angle of elevation.

(a) 120°   (b) 90°   (c) 60°   (d) 30°

17) A ladder leaning against a wall makes an angle of 60° with the wall. If its foot is 6.2 m away from the wall, its length is

(a) 10.2 m   (b) 8 m   (c) 14.2 m   (d) 12.4 m

18) The angle of depression from the top of a tower 12 m high, at a point on the ground is 30°. The distance of the point from the top of the tower is:

(a) 12√3 m   (b) 24 m   (c) 6 m   (d) 12 m

19) From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high. building are 45° and 60° respectively, then the height of the tower is

(a) 14.64 m   (b) 28.64 m   (c) 38.64 m   (d) 19.64 m

20) A spherical balloon of radius r subtends an angle eat the eye of the observer. If the angle of elevation of its centre is Φ, then the height of the centre of balloon is

(a) r sin Φ/2 cos θ   (b) r sin Φ cosec θ   (c) r sin Φ cosec θ/2   (d) None of these

Section - B

21) A rational number in its decimal expansion is 327.7081. What can you say about the prime factors of q. when this number is expressed in the form $\frac{p}{q}$? Give reason. ⓶

22) Without actually performing the long division, state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion. ⓶
$\frac{17}{8}$

23) Sides of triangles are given below. Determine which of them are right angled triangles? In case of a ② right angled triangle, write the length of its hypotenuse.
7 cm, 24 cm and 25 cm

24) ABCD is a trapezium in which AB || DC and its diagonals intersect each other at the point O. Show ② that $\frac{AO}{BO} = \frac{CO}{DO}$.

25) State which pair of triangles in the following figure are similar? Write the similarity criterion used by ② you for answering the question and also write the pairs of similar triangles in the symbolic form:
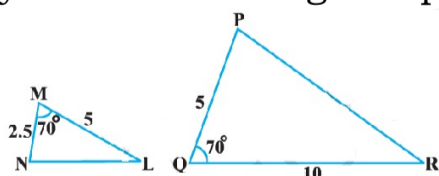
Section - C

26) The perpendicular AD on the base BC of a △ABC intersects BC at D so that DB = 3CD. Prove that ③
2(AB)² = 2(AC)² + BC².

27) ABC is a right-angled triangle, right-angled at A. A circle is inscribed in it. The lengths of the two sides containing the right angle are 6 cm and 8 cm. Find the radius of the incircle. ③

28) Show that the points (7,10), (-2,5) and (3,-4) are the vertices of an isosceles right triangle. ③

29) Show that points A(7,5),B(2,3) and C(6,-7) are the vertices of a right triangle. Also find its area. ③

30) Show that the points A(5,6), B(1,5), C(2,1) and D(6,2) are the vertices of a square. ③

31) Find the value of k for which the point (0,2) is equidistant from two points (3,k) and (k, 5). ③

Section - D

32) Prove that the area of a triangle with vertices (t,t-2), (t+2,t+2) and (t+3,t) is independent of t.

33) Check whether (1,-1),(2,1) and (4,5) are collinear?

34) Find the area of a square, if coordinates of its vertices are (1,2),(6,3), (5,8) and (0,7) taken in order.

35) In a sports day celebration, Pushpraj and Shani are standing at positions A and B whose coordinates are (2, -2) and (4, 8), respectively. the teacher asked Deepanshi to fix the country flag at the mid-point of the line joining points A and B.
(i) Find the coordinates of the mid-point.
(ii) Which mathematical concept is used to solve the question/
(iii) What type of value is depicted here?

Section - E

36) Real numbers are extremely useful in everyday life. That is probably one of the main reasons we all learn how to count and add and subtract from a very young age. Real numbers help us to count and to measure out quantities of different items in various fields like retail, buying, catering, publishing etc. Every normal person uses real numbers in his daily life. After knowing the importance of real numbers, try and improve your knowledge about them by answering the following questions on real life based situations.
(i) Three people go for a morning walk together from the same place. Their steps measure 80 cm, 85 cm, and 90 cm respectively. What is the minimum distance travelled when they meet at first time after starting the walk assuming that their walking speed is same?
(a) 6120 cm   (b) 12240 cm   (c) 4080 cm   (d) None of these

(ii) In a school Independence Day parade, a group of 594 students need to march behind a band of 189 members. The two groups have to march in the same number of columns. What is the maximum number of columns in which they can march?
(a) 9 (b) 6 (c) 27   (d) 29

(iii) Two tankers contain 768litres and 420 litres of fuel respectively. Find the maximum capacity of the container which can measure the fuel of either tanker exactly.
(a) 4litres   (b) 7litres   (c) 12litres   (d) 18litres

(iv) The dimensions of a room are 8 m 25 cm, 6 m 75 crn and 4 m 50 cm. Find the length of the largest measuring rod which can measure the dimensions of room exactly.
(a) 1 m 25cm   (b) 75cm   (c) 90cm   (d) 1 m 35cm

(v) Pens are sold in pack of 8 and notepads are sold in pack of 12. Find the least number of pack of each type that one should buy so that there are equal number of pens and notepads
(a) 3 and 2   (b) 2 and 5   (c) 3 and 4   (d) 4 and 5

37) In a classroom activity on real numbers, the students have to pick a number card from a pile and frame question on it if it is not a rational number for the rest of the class. The number cards picked up by first 5 students and their questions on the numbers for the rest of the class are as shown below. Answer them.

(i) Suraj picked up $\sqrt{8}$ and his question was - Which of the following is true about $\sqrt{8}$?

(a) It is a natural number

(b) It is an irrational number

(c) It is a rational number

(d) None of these

(ii) Shreya picked up 'BONUS' and her question was - Which of the following is not irrational?

(a) 3-4$\sqrt{5}$ **(b) $\sqrt{7}$ -6** **(c) 2+2$\sqrt{9}$** **(d) 4$\sqrt{11}$-6**

(iii) Ananya picked up $\sqrt{5}$ -.$\sqrt{10}$ and her question was - $\sqrt{5}$ -.$\sqrt{10}$ _____is number.

(a) a natural **(b) an irrational** **(c) a whole** **(d) a rational**

(iv) Suman picked up $\dfrac{1}{\sqrt{5}}$ and her question was - $\dfrac{1}{\sqrt{5}}$ is _____ number.

(a) a whole **(b) a rational** **(c) an irrational** **(d) anatural**

(v) Preethi picked up $\sqrt{6}$ and her question was - Which of the following is not irrational?

(a) 15 + 3$\sqrt{6}$ **(b) $\sqrt{24}$- 9** **(c) 5. $\sqrt{150}$** **(d) None of these**

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