UNIVERSAL EDUCATION CENTRE

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MATHS 10TH

SECTION – A

Question numbers 1 to 8 carry one mark each. For each questions, four alternative choices have been provided of which only one is correct. You have to select the correct choice.

Q.1 The Positive real root of the equation $81x^2 - 1 = 0$ is

(A) 9   (B) $\frac{1}{9}$ (C) $\frac{1}{18}$ (D) 81

Q.2 Which term of the A.P 4, 9, 14, 19 _____ is 104?

(A) 21$_{st}$ (B) 15$_{th}$ (C) 22$_{nd}$ (D) 18$_{th}$

Q.3 If angle between two radii of a circle is 130˚, the angle between the tangents at the ends of these radii is :

(A) 90˚   (B) 50˚   (C) 70˚   (D) 130˚

Q.4 In the figure given below, AB is a chord of the circle and AOC is its diameters such that ∠ACB = 50˚. If AT is the tangent to the circle at the point A, then ∠BAT is equal to
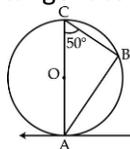
(A) 65˚   (B) 60˚   (C) 50˚   (D) 40˚

Q.5 The length of the tangent drawn from a point 8cm away from the centre of a circle of radius 6cm is

(A) $\sqrt{5}$ cm   (B) $2\sqrt{5}$ cm   (C) 10 cm   (D) $2\sqrt{7}$ cm

Q.6 Given a triangle with side AB = 6 cm. To get a point P on AB such that AP = $\frac{3}{5}$ AB, it is required to devide line segment AB in the ratio : (A) 3 : 2   (B) 3 : 5   (C) 2 : 3   (D) 2 : 5

Q.7 The radii of the bases of a cylinder and a cone are in the ratio 3:4 and their heights are in the ratio 2:3, then the ratio between the volume of cylinder to that of cone is.

(A) 8 : 9   (B) 9 : 8   (C) 5 : 7   (D) 7 : 5

Q.8 The area of the largest triangle that can be inscribed in a semicircle of radius r unit is

(A) r^2 sq. u   (B) $\frac{1}{2}r^2$ sq. u   (C) $2 r^2$ sq. u   (D) $\sqrt{2} r^2$ sq. u

SECTION – B   Question number 09 to 14 carry 2 marks each.

Q.9 At an instant, the length of the shadow of a pole is $\sqrt{3}$ times the height of the pole then, find the angle of elevation of the sun.

Q.10 If a die is rolled once, then find the probability of getting an odd prime number.

Q.11 Solve for x : $abx^2 + (b^2 - ac)x - bc = 0$

Q.12 Find the next two terms of the A.P $\sqrt{2}$, $\sqrt{8}$, $\sqrt{18}$.

Q.13 If two tangents are drawn to a circle from an external point, then prove that they are equally inclined to the line segment, joining the centre to that point.

Q.14 The minute hand of a clock is 12 cm. long. Find the area of the face of the clock described by the minute hand between 9.A.M. and 9:35 A.M.

SECTION – C   Question numbers 15 to 24 carry 3 marks each.

Q.15 Find the volume of the largest right circular cone that can be cut out from a solid cube of edge 4.2 cm.

Q.16 If the points A (- 2, 2) and B (x, 8) are on the circle with the centre O (2, 5), find the value of x.

Q.17 If the points P (x, y) is equidistant from the points A (a + b , b - a) and B (a-b , a + b), prove that bx = ay.

Q.18 A pair of dice is thrown once; find the probability of obtaining a total of ten.   **OR**

A bag contains 3 red 4 white and 2 green balls. A ball is drawn at random from the bag. Find the probability that the drawn ball is (i) Not white (ii) green.

Q.19 If - 4 is a root of the quadratic equation $x^2 + kx - 4 = 0$, and the quadratic equation $x^2 + px + k = 0$ has equal roots, find the value of P and K. **OR**

Solve for x : $\left(\frac{2x}{x-5}\right)^2 + \frac{10x}{x-5} - 24 = 0$, $x \neq 5$

Q.20 The 5_{th} term of an A.P is 26 and 10_{th} terms is 51. Determine the 15_{th} term of A.P

Q.21 If quadrilateral ABCD is circumscribing a circle, then prove that AB + CD = AD + BC
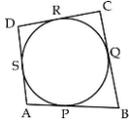
OR

If all sides of a parallelogram touch a circle, show that the parallelogram is a rhombus.

Q.22 Draw a circle of diameter 8cm. From a point P, 7 cm away from its centre construct a pair of tangents to the circle

Q.23 In the given figure, the boundary of shaded region consists of four semicircular areas, two smallest being equal. If diameter of the largest is 14cm. and that of the smallest is 3.5 cm, calculate the area of the shaded region.
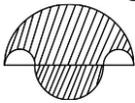
Q.24 A hemispherical depression is cutout from one face of a cubical wooden block such that the diameter 14cm of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.

OR

The radii of circular ends of a solid frustum of a cone are 33cm and 27cm and its slant height is 10cm. Find its total surface area**.** (Use $\pi = 3.14$)

SECTION – D   **Question numbers 25 to 34 carry 4 marks each.**

Q.25 A 1.2m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60˚. After sometime, the angle of elevation reduces to 30˚ Find the distance travelled by the balloon during the interval.

Q.26 If A (5, - 1), B (- 3, - 2) and C (-1, 8) are the vertices of triangle ABC, find the length of median through A.

Q.27 Point P divides the line segment joining the points A (-1, 3) and B (9, 8) such that $\frac{AP}{PB} = \frac{k}{1}$ If P also lies on the line

$x - y + 2 = 0$, find the value of k.

Q.28 One card is drawn from a well – shuffled deck of 52 cards. Find the probability of getting (i) a king of red colour (ii) a face card (iii) a ten.

Q.29 Rs 6500 were divided equally among a certain number of persons' Had there been 15 more persons, each would have got Rs 30 less? Find the original number of persons. **OR**
A farmer wishes to grow a 100m₂ rectangular vegetable garden. Since he has with him only 30m, barbed wire, he fences three sides of the rectangular garden letting compound wall of his house act as the fourth side fence. Find the dimensions of his garden.

Q.30 A theatre has 40 rows with 30 seats in the first row, 33 in the second row, 36 in the third row and so on. How many seats are there in the theatre?

Q.31 Prove that the length of tangents drawn from an external point to a circle is equal.

Q.32 A toy is in the form of a hemisphere surmounted by a right circular cone of the same base radius as that of the hemisphere. If the radius of base of the cone is 21cm and its volume is $\frac{2}{3}$ of the volume of the hemisphere, calculate the height of the cone. **OR**
Water is flowing at the rate of 7 meters per second through a cylindrical pipe whose internal diameter is 2 cm into a cylindrical tank the radius of whose base is 40cm. Determine the increase in the water level in $\frac{1}{2}$ hour.

Q.33 A circus tent of total height 50 meters is to be made in the form of right circular cylinder surmounted by a right circular cone. If the height and radius of the conical portion of the tent are 15 meters and 20 meters respectively. Find the cost of cloth required, at the rate of Rs 14 per square meter to make the tent**.**

Q.34 From the top of a building 12m high, the angle of elevation of the top of a tower is found to be 30˚. From the bottom of the same building the angle of elevation of the top of the tower is found to be 60˚. Determine the height of the tower and the distance between the tower and building. *ALL THE BEST*