

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 If x = 1 is a common root of the equations a $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$, then the value of ab is : (B) 3.5 (D) -3 (A) 3 (C) 6 Q.2 If 18, a, b, - 3 are in A.P then a+b=? (A) 19 (B) 7 (C) 11 (D) 15 Q.3 If tangent PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 80° then $\angle POA$ is : (A) 50° (B) 60° (C) 70° (D) 80° Q.4 If PT is tangent drawn from a point P to a circle touching it at T and O is the centre of the circle, then $\angle OPT + \angle POT$ is : (C) 90° (D) 180° (A) 30° (B) 60° Q.5 In fig, two equal circles touch each other at T, if QP=4.5 cm, then QR is : (B) 18 cm (A) 9 cm (C) 15 cm (D) 13.5 cm Q.6 The area of the largest triangle that can be inscribed in a semi-circle of radius r, is : (B) $2 r^2$ (C) r^{3} (D) $2 r^3$ $(A) r^2$ Q.7 The radius of wire is decreased to one-third. If volume remains the same, the length will become : (C) 9 times (D) 27 times (A) 3 times (B) 6 times Q.8 The perimeter of a square circumscribing a circle of radius a unit is : (A) 2 a unit (B) 4 a unit (C) 8 a unit (D) 16 a unit SECTION - B Question number 09 to 14 carry 2 marks each. Q.9 The tops of two poles of height 16 m and 10 m are connected by a wire of length *l* metres if the wire makes

an angle of 30° with the horizontal, then find l.

- Q.10 In a single throw of a pair of dice, find the probability of getting the sum 9 .
- Q.11 Find the values of k for which the following equation has equal roots. $(k 12)x^2 + 2(k 12)x + 2 = 0$.
- Q.12 Find the 7th term from the end of the A.P 7, 10, 13 184.
- Q.13 Prove that the tangents at the extremities of any chord makes equal angles with the chord.

Q.14 In fig., find the area of the shaded region. (use π =3.14).



SECTION – C

Question numbers 15 to 24 carry 3 marks each.

- Q.15 A juice seller was serving his customers using glasses. The inner diameter of the cylindrical glass was 5 cm, but the bottoms of the glass had a hemispherical raised portion which reduces the capacity of the glass. If the height of the glass was 10 cm, find the apparent capacity and actual capacity of the glass : (Use $\pi = 3.14$)
- Q.16 If P (2,-1) Q (3, 4) R (-2, 3) and S (-3, -2) be four points in a plane, show that PQRS is a rhombus but not a square.
- Q.17 Find the point of trisection of the line segment joining the points (5, -6) and (-7, 5).
- Q.18 A bag contains lemon flavored Candy only. Malini takes out one Candy without looking into the bag. What is the probability that she takes out. (i) an orange flavoured Candy ? (ii) a lemon flavoured Candy ? OR

Find probability that a no. selected at random from 1......35 is a (i) prime no. (ii) multiple of 7.

Q.19 If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $P(x^2 + x) + k = 0$ has equal roots, find the value of k.

OR Solve, for value of $x : 4x^2 - 2(a^2 + b^2)x + a^2b^2 = 0$.

- Q.20 Find the sum of all odd integers between 2 and 100 divisible by 3.
- Q.21 A circle with centre O touches the sides of a quadrilateral ABCD at P, Q, R and S respectively. Prove that the angles, subtended at the centre by a pair of opposite sides of ABCD are supplementary.

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In fig. Two circles with centre A and B touch each externally. PM=15 cm is tangent to circle with centre A and QN=13 cm is tangent to circle with centre B from external point Q. If PA=17 cm and BQ=12 cm. Find the distance between the centres A and B of circles.



Q.22 Construct a triangle similar to a given \triangle ABC such that each side is $(\frac{5}{7})^{th}$ of the corresponding sides of

△ABC. It is given that AB=5 cm, BC=7 cm and ∠ABC=50°.

Q.23 Find the area of shaded region in the fig. where ABCD is a square of side 10 cm. (use π = 3.14)



Q.24 The cost of painting the total outer surface of a closed cylindrical oil tank at 60 paise per sq. cm. is Rs. 237.60. The height of the tank is 6 times the radius of the base of the tank. Find height and radius of the tank. (use = $\frac{22}{7}$)

OR

The surface area of a solid metallic sphere is 616 cm². It is melted and recast into a cone of height 28 cm. Find the diameter of the base of the cone so formed. (use = $\frac{22}{7}$)

SECTION – D

Question numbers 25 to 34 carry 4 marks each.

- Q.25 A person observed the angle of elevation of the top of a tower as 30°. He walked 50 m towards the foot of the tower along level ground and found the angle of elevation of the top of the tower as 60°. Find the height of the tower.
- Q.26 If R (x, y) is a point on the line segment joining the points P (a, b) and Q (b, a), then prove that x+y = a+b.
- Q.27 Determine the ratio in which the straight line x-y+2=0 divides the line segment joining (-1, 3) and (9, 8).
- Q.28 A bag contains 8 red, 6 white and 4 black balls. A ball is drawn at random from the bag. Find the probability that the drawn ball is : (i) red or white (ii) not black (iii) neither white nor black
- Q.29 A two digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchanges their places. Find the number.

OR

The denominator of a fraction is one more than twice the numerator if the sum of the fraction and its reciprocal is $2\frac{16}{21}$, find the fraction.

- Q.30 A man repays a loan of Rs. 3250 by paying Rs. 20 in the first month and then increases the payment by Rs. 15 every month. How long will it take him to clear the loan ?
- Q.31 In fig. '*l*' and 'm' are two parallel tangents at A and B. The tangent at C makes an intercept ED between *l* and *m*. Prove that $\angle DFE=90^{\circ}$.



Q.32 A hollow metallic cylinder whose outer radius is 4.3 cm and internal radius is 1.1 cm and whole length is 4 cm, is melted and recast into a solid cylinder 12 cm long. Find the diameter of solid cylinder.

OR

A vessel is in the form of an inverted cone. Its height is 8 cm. It is fill with water up to brim. When 100 lead shots each of which is a solid sphere of radius 0.5 cm are dropped in the vessel, one fourth of water flows out. Find the diameter of its top.

- Q.33 The slant height of a frustum of a cone is 4 cm and the perimeter of circular ends are 18 cm and 6 cm. Find the cost of painting its curved surface at Rs. 10 per square meter.
- Q.34 From the top of a building 60 m high the angles of depression of the top and the bottom of a tower are observed to be 30° and 60°. Find the height of the tower.

