**Class: X**

**Max Marks: 90** **TIME: 3 HR.**

**Note :** Section A contains **4** questions of **1** mark each, which are multiple choice type questions, Section B contains **6** questions of **2** marks each, Section C contains **10** questions of **3** marks each and Section D contains **11** questions of **4** marks each.

**SECTION-'A'**

Q1. In an AP, $a$ and $b$ are first and last terms respectively. If AP has $n+2$ terms, find the common difference of the AP.

Q2. Find the value of $K$ so that the equation $x^2-8x+K=0$ has equal roots.

Q3. If $A(-2,-1), B(a,0), C(4,3)$ and $D(1,2)$ are the vertices of a parallelogram, find the value of $a$.

Q4. If P(E) = 0.08, then find P( not E).

**SECTION-'B'**

Q5. If the roots of the equation $x^2-nx+m=0$ differ by 1, then prove that $n^2-4m-1=0$.

Q6. A bicycle wheel makes 7 revolutions in moving 11 m. Find the diameter of the wheel.

Q7. If the area of $\Delta ABC$ formed by $A(x,y), B(1,2)$ and $C(2,1)$ is 6 square units, then prove that $x+y=15$ or $x+y+9=0$.

Q8. If $\frac{1}{x+2}, \frac{1}{x+3}, \frac{1}{x+5}$ are in AP, then find the value of $x$.

Q9. Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 42 cm.

Q10. Find the number of coins of 1.5 cm diameter and 0.2 cm thickness to be melted to form a right circular cone of height 10 cm and diameter 4.5 cm.

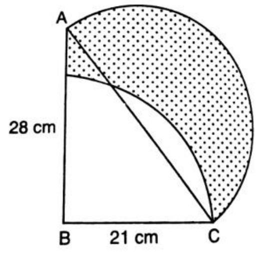
**SECTION-'C'**

Q11. From numbers 3, 5, 5, 6, 7, 7, 9, 9, 9, 10 one number is selected at random. Find the probability that the selected number is mean.

Q12. Find the roots of the quadratic equation $12abx^2-(9a^2-8b^2)x-6ab=0$.

Q13. Two solid right circular cones have the same height. The radii of their bases are $r_1$ and $r_2$. They are melted and recast into a cylinder of the same height. Show that the radius of the base of the cylinder is $\sqrt{\frac{r_1^2+r_2^2}{3}}$.

Q14. In the given figure, ABC is a right angled triangle, $\angle B = 90^\circ$, AB = 28 cm and BC = 21 cm. With AC as diameter a semicircle is drawn and with BC as radius a quarter circle is drawn. Find the area of the shaded region.




Q15. The radii of two concentric circles are 13cm and 8 cm. AB is a diameter of the bigger circle. BC is tangent to the smaller circle touching it at C. Find the length AC.

Q16. AB is a diameter of a circle. P is a point on the semi-circle APB. AH and BK are perpendiculars from A and B respectively to the tangent at P. Prove that AH+BK=AB.

Q17. Find the sum of all two digit numbers which when divided by 7 gives a remainder of 3.

Q18. The ratio of the sums of *m* and *n* terms of an AP is $m^2 : n^2.$ Show that the ratio of the $m^{th}$ and $n^{th}$ terms is $(2m-1):(2n-1).$

Q19. A girl fills a cylindrical container 32cm in height and 18cm in radius with sand. She empties the container on the ground and makes a conical heap of the same. If the height of the conical heap is 24cm, find its radius.

Q20. Draw a pair of tangents inclined to each other at an angle of $60^\circ$ to a circle of radius 3 cm.

**SECTION-'D'**

Q21. 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.

Q22. Two cars start together in the same direction from the same place. The first goes with uniform speed of 10 km/hr. The second goes at a speed of 8 km/hr in the first hour and increases the speed by ½ km/ hr each succeeding hour. After how many hours will the second car overtake the first car if both cars go non-stop ?

Q23. The height of a cone is 30cm. A small cone is cut off at the top by a plane parallel to the base. If its volume be $\frac{1}{27}$ of the volume of the given cone, at what height above the base is the section made?

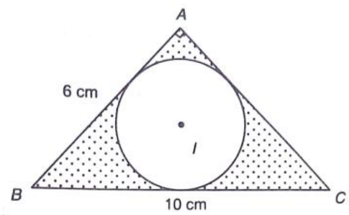
Q24. Construct a ΔABC whose sides are 7.5cm,7cm and 6.5cm. Construct another triangle similar to ΔABC and with sides $\frac{2}{3}$ rd of the corresponding sides of ΔABC.

Q25. From a window *x* meters high above the ground in a street, the angle of elevation and depression of the top and foot of the other house on the opposite side of the street are $\alpha$ *and* $\beta$ respectively. Show that the height of the opposite house is $x(1+\tan\alpha\cot\beta)$ meters.

Q26. From the top of a building 15m high the angle of elevation of the top of a tower is found to be $30^\circ$. From the bottom of the same building, the angle of elevation of the top of the tower if found to be $60^\circ$. Find the height of the tower and the distance between the tower and building.

Q27. Prove that parallelogram circumscribing a circle is rhombus.

Q28. In the given figure, ABC is a right triangle with $\angle A = 90^\circ$. Find the area of the shaded region if AB = 6cm, BC = 10cm and I is the centre of the incircle of $\Delta ABC$.




Q29. A bucket of height 8cm and made up of copper sheet is in the form of frustum of a right circular cone with radii of its lower & upper ends as 3cm & 9cm respectively. Calculate the height of the cone of which the bucket is a part.

Q30. Find the circumcentre of the triangle whose vertices are $(-2,-3),(7,-6)\,\&\,(-1,0).$

Q31. If the mid-point of the line joining (– 3, *k*) and (*k*, –1) is (*x*, *y*) and $2x+3y-5=0.$

***(Agt)***

*ANSWERS*:

Q1. $d = \frac{b-a}{n+1}$

Q2. 16

Q3. 1

Q4. 0.92

Q6. 0.5 m

Q8. 1

Q9. 19404 $cm^3$

Q10. 150

Q11. $\frac{1}{5}$

Q12. $\frac{3a}{4b}, -\frac{2b}{3a}$

Q14. 428.75 $cm^2$

Q15. 19 cm

Q17. 676

Q19. 36 cm

Q21. 50

Q22. 9 Hrs

Q23. 20 cm

Q27. 22.5m, 12.975m

Q28. $\frac{80}{7}\text{cm}^2$

Q29. 12cm

Q30. $(3, -3)$

Q31. 3