



TOPPER SAMPLE PAPER 5  
Summative Assessment-II  
MATHEMATICS  
CLASS X

M.M: 80

TIME :  $3-3\frac{1}{2}$  Hrs.

GENERAL INSTRUCTIONS :

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections, namely  
Section A : 10 questions (1 mark each)  
Section B : 8 questions (2 marks each)  
Section C : 10 questions (3 marks each)  
Section D : 6 questions (4 marks each)
3. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks and 2 questions of four marks each.
4. Use of calculators is not allowed.

SECTION A

Q1. If  $x=b$  is a solution of  $x^2 - (a + b)x + p = 0$ , then the value of  $p$  is

- (a)  $ab$       (b)  $a + b$       (c)  $a - b$       (d)  $\frac{a}{b}$

Q2. The ratio of the volume of a cube to that of a sphere which will exactly fit

inside the cube is

- (a)  $\pi : 8$       (b)  $\pi$       (c)  $8 : \pi$       (d)  $6 : \pi$



- Q3. If A (1,2) , B (4,y), c (x,6) and D (3,5) are the vertices of a parallelogram taken in order then the values of x and y are
- (a) 6 and 5  
(b) 6 and 3  
(c) 2 and 3  
(d) 5 and 2
- Q4. In a lottery there are 5 prizes and 20 blanks. The probability of getting a prize is
- (a)  $\frac{1}{2}$       (b)  $\frac{1}{3}$       (c)  $\frac{1}{4}$       (d)  $\frac{1}{5}$
- Q5. If x silver coins 1.75 cm in diameter and of thickness 2 mm, must be melted to form a cuboid 11cmx10cmx7cm, then the value of x is
- (a) 1200      (b) 1400      (c) 1600      (d) 1800
- Q6. PQ is a tangent drawn from a point P to a circle with centre O and QOR is a diameter of the circle such that  $\angle POR=120^\circ$ , then  $\angle OPQ$  is
- (a)  $60^\circ$       (b)  $45^\circ$       (c)  $30^\circ$       (d)  $90^\circ$
- Q7. In given AP 210 is ..... term: 2,6,10.....
- (a) 50<sup>th</sup>      (b) 52<sup>nd</sup>      (c) 53<sup>rd</sup>      (d) 54<sup>th</sup>
- Q8. A kite is flying, attached to a thread which is 165m long. The thread makes an angle of  $30^\circ$  with the ground. The height of the kite from the ground, assuming that there is no slack in the thread is
- (a) 80 m      (b) 81.5 m      (c) 82.5 m      (d) 84 m



Q9. The points  $(a, b + c)$ ,  $(b, c + a)$  and  $(c, a + b)$  are

- (a) Collinear
- (b) Non-collinear
- (c) Concurrent
- (d) All of the above

Q10. If the area of a circle is  $154 \text{ cm}^2$ , then its perimeter is

- (a) 11cm
- (b) 22cm
- (c) 44cm
- (d) 55cm

## SECTION B

Q11. Find the area of a square ABCD, whose vertices are  $A(5,6)$ ,  $B(1,5)$ ,  $C(2,1)$

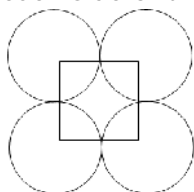
and  $D(6,2)$ .

Q12. The height of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.

Q13. Prove that the angle between two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segments joining the points of contact at the centre.

Q14. The minute hand of a clock is 10 cm long. Find the area of the face of the clock described by the minute hand between 9AM and 9:35 AM.

Q15. Four equal circles are described about the four corners of a square so that each touches two of the others as shown in figure. Find the area of the square not included in the circles if each side of the square measures 14cm.



Q16. A number  $x$  is selected from the numbers 1, 2, 3 and then a second number  $y$  is randomly selected from the numbers 1, 4, 9. What is the probability that the product  $xy$  of the two numbers will be less than 9?

OR

Three unbiased coins are tossed together. Find the probability of getting atmost two tails.



- Q17. Determine the 10<sup>th</sup> term from the end of the AP 4,9,14,.....,254.  
Q18. Show that the tangents at the end points of a diameter of a circle are parallel.

## SECTION C

- Q19. The area of a triangle is 5. Two of its vertices are (2, 1) and (3,-2) and the third vertex lies on  $y=x+3$ . Find the third vertex.  
Q20. If the roots of the equation  $(a-b)x^2+(b-c)x+(c-a)=0$  are equal then prove that  $2a=b+c$ .

OR

Solve :  $\frac{1}{a} + \frac{1}{b} + \frac{1}{x} = \frac{1}{a+b+x}$

- Q21. Draw a pair of tangents to a circle of radius 5cm which are inclined to each other at angle of  $60^\circ$ . Also, write the steps of construction.

OR

Construct a  $\triangle ABC$  in which  $AB = 4$  cm,  $BC = 5$  cm and  $AC = 6$  cm. Then, construct a triangle  $A'BC'$  such that  $\frac{C'A'}{CA} = \frac{BA'}{BA} = \frac{BC'}{BC} = \frac{2}{3}$ .

- Q22. The  $m$  th term of an AP is  $n$  and the  $n$  th term is  $m$ . find the sum of  $(m + n)$  terms.  
Q23. Two pillars of equal height are on either side of a road, which is 100m wide. The angles of elevation of the top of the pillars are  $60^\circ$  and  $30^\circ$  at a point on the road between the pillars. Find the height of the pillars.

OR

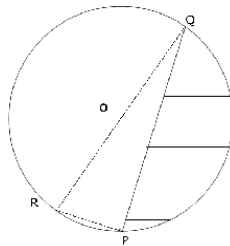
As observed from the top of a lighthouse, 100 metres high above sea level, the angle of depression of a ship moving directly towards it, changes from  $30^\circ$  to  $60^\circ$ . Determine the distance travelled by the ship during the period of observation.

Q24. Find the coordinates of the vertices of a  $\triangle ABC$  with A (1,-4) and the mid point of sides through A being (2,-1) and (0,-1).

Q25. One card is drawn from a well shuffled pack of 52 cards. Calculate the probability of getting

- (i) A king or a queen
- (ii) Neither a heart nor a red king

Q26. Find the area of the shaded region if  $PQ=24\text{cm}$ ,  $PR=7\text{cm}$  and O is the centre of the circle.



Q27. An iron pole consisting of a cylindrical portion 110cm high and of base diameter 12cm is surmounted by a cone 9cm high. Find the mass of the pole, given that 1cu cm of iron has 8 gm mass (approx.)

Q28. Water flows at the rate of 10m per minute through a cylindrical pipe having its diameter as 5mm. how much time will it take to fill a conical vessel whose diameter of base is 40cm and depth is 24cm?

## SECTION D

Q29. Prove that the coordinates of the centroid of a triangle whose vertices are  $(x_1, y_1)$ ,  $(x_2, y_2)$  and  $(x_3, y_3)$  is given by  $\left[ \frac{(x_1 + x_2 + x_3)}{3} \right]$ ,  $\left[ \frac{(y_1 + y_2 + y_3)}{3} \right]$ .



Q30. A vertical tower stands on a horizontal plane and is surmounted by a vertical flagstaff of height  $h$ . At a point on the plane, the angles of elevation of the bottom and the top of the flagstaff are  $\alpha$  and  $\beta$  respectively. Prove that the height of the tower is  $h \frac{\tan \alpha}{\tan \beta - \tan \alpha}$ .

Q31. By increasing the list price of a book by Rs10, a person can buy 10 less books for Rs.1200. Find the original list price of the book.

OR

Two years ago a man's age was three times the square of his son's age. Three years hence his age will be four times his son's age. Find their present ages.

Q32. Prove that the lengths of tangents drawn from an external point to a circle are

equal.

OR

Prove that the radius of a circle is perpendicular to the tangent at the point of contact.

Q33. A circle is touching the side BC of  $\triangle ABC$  at P and touching AB and AC produced at Q and R respectively. Prove that

$$AQ = \frac{1}{2} (\text{perimeter of } \triangle ABC).$$

Q34. A bucket is in the form of a frustum of a cone of height 30 cm with radii of its lower and upper ends as 10 cm and 20 cm, respectively. Find the capacity and surface area of the bucket. Also, find the cost of the milk which can completely fill the container, at the rate of Rs 25 per litre (use  $\pi = 3.14$ ).