



# St. Xavier's Sr. Sec. School

Delhi-54

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No. of printed pages : 02

No. of questions : 31

Summative Assessment II in **MATHEMATICS – Std. 10**  
14-3-2016

M. Marks : 90  
Time : 3 hrs.

### General Instructions:

i) All questions are **compulsory**.

ii) The question paper consists of **31** questions divided in to **four** sections **A, B, C** and **D**.

**Section - A** comprises of **4** questions of **1 mark** each, **Section – B** comprises of **6** questions of **2 marks** each, **Section – C** comprises of **10** questions of **3 marks** each and **Section – D** comprises of **11** questions of **4 marks** each.

iii) There is no overall choice.

### SECTION – A

- Find the value of k for which  $x = 1$  is a root of the quadratic equation  $x^2 + kx + 3 = 0$ .
- If  $5x + 2$ ,  $4x - 1$  and  $x + 2$  are in A.P. then find the value of x.
- What is the probability of getting 53 Fridays in a leap year?
- Find the coordinates of the mid point of the line segment joining  $(8, -2)$  and origin.

### SECTION – B

- If the point  $P(x, y)$  is equidistant from the points  $A(5, 1)$  and  $B(-1, 5)$  prove that  $3x = 2y$ .
- 50 circular plates each of diameter 14cm and thickness 0.5cm are placed one above the other to form a right circular cylinder. Find its total surface area.
- If  $-4$  is a root of the equation  $x^2 + px - 4 = 0$  and the equation  $x^2 + px + q = 0$  has equal roots, find the value of p and q.
- The radii of two circles are 8cm and 6cm respectively. Find the radius of the circle having its area equal to the sum of the areas of the two circles.
- The dimensions of a metallic cuboid are 100cm x 80cm x 64cm. It is melted and recast into a cube. Find the surface area of the cube.
- Which term of the A.P. 25, 20, 15..... is the first negative term?



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Delhi-54

## SECTION – C

11. A wooden article is made by scooping out a hemisphere of maximum possible diameter from each end of a solid cylinder. If the height of the cylinder is 10cm and its base is of radius 3.5cm, find the volume of the article.
12. Prove that the parallelogram circumscribing a circle is a rhombus.
13. Solve:  $2\left(\frac{2x-1}{x+3}\right) - 3\left(\frac{x+3}{2x-1}\right) = 5; \quad x \neq -3, \frac{1}{2}.$
14. The sum of the first 8 terms of an A.P. is 100 and the sum of its first 19 terms is 551. Find the A.P.
15. Draw a circle of radius 3.5 cm. Construct a pair of tangents to this circle, which are inclined to each other at an angle of  $60^\circ$ . Also measure the length of the tangents.
16. A chord of a circle of radius 21cm subtends a right angle at the centre. Find the area of the corresponding
  - a) Minor segment
  - b) Major sector.
17. A toy is in the shape of a right circular cylinder with a hemisphere on one end and a cone on the other. The radius and height of the cylindrical part are 5cm and 13cm respectively. The radii of the hemispherical and conical parts are the same as that of the cylindrical part. Find the surface area of the toy, if the total height of the toy is 30cm.
18. Find the roots of the equation  $\frac{1}{x} - \frac{1}{x-2} = 3.$
19. One card is drawn from a well shuffled deck of 52 cards. Find the probability of drawing
  - a) An ace
  - b) A red king
  - c) Black face card.
20. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.



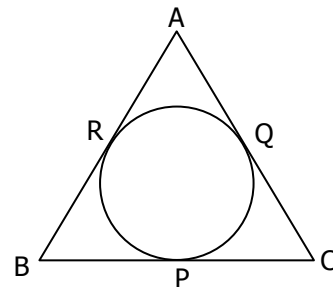
# St. Xavier's Sr. Sec. School

Delhi-54

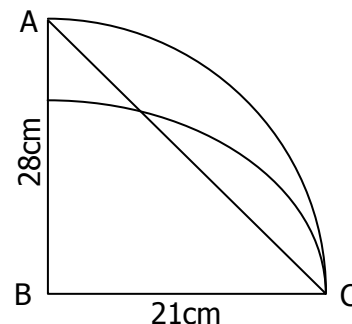
## SECTION – D

21. An aeroplane left 30 minutes later than its scheduled time and in order to reach its destination 1500km away in time, it had to increase its speed by 250km/hr from its usual speed. Determine its usual speed.
22. In what ratio is the line segment joining the points  $(-2, -3)$  and  $(3, 7)$  divided by the y-axis? Also, find the coordinates of the point of division.
23. The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is  $60^\circ$ . At a point Y, 40m vertically above X, the angle of elevation is  $45^\circ$ . Find the height of the tower PQ. (take  $\sqrt{3} = 1.73$ ).

24. Prove that the length of tangents drawn from an external point to a circle are equal.  
A circle is inscribed in  $\triangle ABC$ , touching BC, CA and AB at P, Q and R respectively as shown in the figure.  
If  $AB = 10\text{cm}$ ,  $AQ = 7\text{cm}$  and  $CQ = 5\text{cm}$ , find the length of BC.



25. In the given figure, ABC is a right angled triangle in which  $\angle B = 90^\circ$ .  $AB = 28\text{cm}$  and  $BC = 21\text{cm}$ . With AC as diameter a semicircle is drawn and with BC as radius a quadrant of a circle is drawn. Find the area of the shaded part.



26. A black die and a white die are thrown at the same time. Write all possible outcomes. What is the probability
- that the sum of the two numbers that turn up is more than 9?
  - of obtaining a doublet?
  - that 5 will come up at least once?
27. Construct  $\triangle ABC$  in which  $BC = 5\text{cm}$ ,  $CA = 6\text{cm}$  and  $AB = 7\text{cm}$ . Construct  $\triangle A'BC'$  similar to  $\triangle ABC$ , each of whose sides is  $7/5$  times the corresponding sides of  $\triangle ABC$ .
28. In order to help a poor family, Radha's mother used to put aside some rice everyday in a



# St. Xavier's Sr. Sec. School

Delhi-54

container which was in the form of a frustum of a cone of height 14cm and radii of its lower and upper ends were 8cm and 20cm respectively. Find the volume of the container in which she collected the rice. By doing so what value is depicted by Radha's mother?

29. A two digit number is such that the product of its digits is 18. When 63 is subtracted from the number, the digits interchange their places. Find the number.
30. Find the area of the triangle formed by joining the midpoints of the sides of the triangle whose vertices are A(2, 2), B(4, 4) and C(2, 6).
31. The angle of elevation of an aeroplane from a point on the ground is  $45^\circ$ . After flying for 15 seconds, the elevation changes to  $30^\circ$ . If the aeroplane is flying at a height of 2500 metres, find the speed of the aeroplane. (use  $\sqrt{3} = 1.732$ )

-X-X-X-X-X-