Code No. **Series AG-F5**

18th Year of Quality education

TMG -D/79/89

- Please check that this question paper contains 3 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 30 questions.

General Instructions: -

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into three sections A, B ,C and D . Section A contains 10 questions of 1 marks each, Section B is of 5 questions of 2 marks each, Section C is of 10 questions of 3 marks each and Section D is of 5questions of 6 marks each.
3. Write the serial number of the question before attempting it.
4. If you wish to answer any question already answered, cancel the previous answer.
5. In questions where internal choices is provided. You must attempt only one choice.

Pre-Board Examination 2009 -10

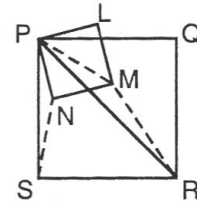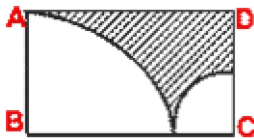*Time: 3 hrs.*   *M.M.: 80*

CLASS – X   MATHEMATICS

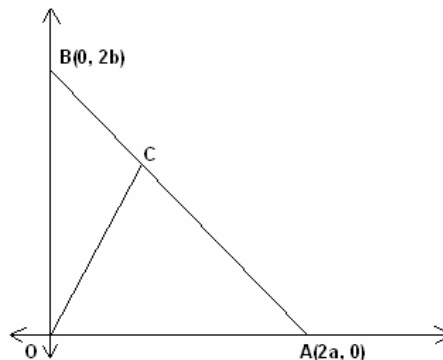|	**Section A**
Q.1	If and are the zeros of the polynomial $x^2 + 7x + 7$, then find the value of $1/ + 1/ - 2$.
Q.2	If 2 and 3 are zeroes of polynomial $3x^2 – 2ax + 2b$, find the value of a and b.
Q.3	Verify that sin 3A = Sin2A.cos2A + cos2A.Sin2A, if A = 30^0.
Q.4	An arc of a circle is of length 6 and the sector it bounds has an area 30 cm^2. Find the radius of the circle.
Q.5	Half the perimeter of a rectangular garden, whose length is 4 m more its width is 36 m. Find the area garden, also find the length and breadth of garden.
Q.6	In an A.P, if pth term is q and qth term is p, show that nth term is (p + q – n).
Q.7	Let ABC ~ DEF and their areas be respectively 64cm^2 and 121cm^2. If EF = 15.4cm find BC.
Q.8	The sum of the square of two natural numbers is 34. If the first number is one less than twice the second number, find the numbers.
Q.9	A box contains 19 balls bearing numbers 1,2,3 ….. 19. A ball is drawn at random from the box. What is the probability that the number of the balls drawn is a prime number.
Q.10	The centre of a circle is (2K – 1, 7) and it passes through the point (-3,-1) if the radii of the circle is 10 units, then find the values of k .
	Section B
Q.11	Determine the value of c for which the following system of equation has infinite number of solutions: cx +3y = c-3,12x + c y = c .

Q.12	Consider $\triangle ABC$, right-angled at C, in which AB=29 units, BC=21 units and $\angle ABC = \theta$. Determine the value of the following: $(i)\sec^2\theta - \tan^2\theta$ $(ii)\cos^2\theta - \sin^2\theta$
Q.13	Show that the point A(a, a), B(-a,-a) and C(-a√3,-a√3) form an equilateral triangle. <center>Or</center> Find the ratio in which the line segment joining P(2, -3) and Q(4, 8) is divided by x-axis.
Q.14	A square ABCD is inscribed in a circle of radius 10 units .Find the area of the circle , not included in the square (use $\pi = 3.14$).
Q.15	Find the value of p and q for which the following linear equations has many solutions: 2x – y = 5; (p + q)x + (2p – q)y = 15.
	<center>**Section C**</center>
Q.16	Solve for x: 12abx^2 – (9a^2 – 8b^2)x – 6ab = 0.
Q.17	Draw a circle of radius 3 cm. from a point P 6 cm away from its centre coustruct a pair of tangents to the circle measure the lengths of the tangents.
Q.19	Two tangents PA and PB are drawn to a circle with centre O. from an external point P. Prove that angle APB is twice angle OAB. <center>Or</center> △ABC and △DBC are two △les on the same base BC. If AD intersects BC at O. Prove that ar. (△ABC) : ar. (△DBC) = AO : DO.
Q.18	Use a single graph paper and draw the graph of the following equations: 2y – x = 8; 5y – x = 14; y – 2x = 1
Q.19	In the adjoining figure PQRS and PLMN are squares prove that i. PM : PN = PR : PS ii. Δ PRM and ΔPSN are similar
Q.20	Water in a canal, 6m wide and 1.5m deep, is flowing with a speed of 10km/h. How much areas will it irrigate in 30 minutes, if 8cm of standing water is needed?
Q.21	In the figure given below, ABCD is a rectangle with sides BC = 42 cm and AB = 28 cm. Two quarter circles are drawn as shown in figure. Calculate the area of the shaded part. <center>or</center> Find the area of the shaded design in figure, where ABCD is a square of side 10 cm

and semicircles are drawn with each side of square as diameter.
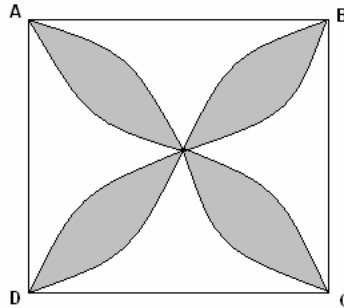
Q.22	A circle touches the side BC of a ABC at P and AB and AC when produced at Q and R respectively. Show that AQ=½ (perimeter of ABC)
Q.23	In the given figure, a right triangle AOB is given. C is the mid point of the hypotenuse AB. Show that it is equidistant from the vertices O, A and B. Or Given two fixed points P(-3, 4) and Q(5, -2). Calculate the co-ordinates of points A and B in between PQ, such that 5PA=3PQ and 3PB=2PQ.
Q.24	A metallic right circular cone 20cm high and whose vertical angle is 60o is cut into plane par to its bare. If the frustum so obtained be drawn into a wire of diameter 1/16 cm, Find the leng of the wire. **Or** The interior of building is in the form of a right circular cylinder of radius 7m and height 6m, surmounted by right circular cone of same radius and of vertical angle 60^0. Find the cost of painting the building from inside at the rate of Rs. 30 per m^2
Q.25	A bag has cards numbered 18 to 98 cards are mixed thoroughly and a card is drawn from the bag at random. Find the probability that the number on the card ,x drawn from the box is (1) c an odd number (2) a cubic number (3) a number divisible by 8
	Section D

| Q.26 | Find mean, median and mode for the following data |

marks obtained :	15-20	20 -25	25-30	30-35	35-40	40-45	45-50	55-55
No. of students :	3	8	9	10	3	0	0	2

Q.27	Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides. using the above theorem prove the following.
	The area of the equilateral triangle described on the side of a square is half the area of the equilateral triangle described on its diagonal.

| Q.28 | The angle of elevation of the top of an unfinished tower at a point distant 100cm. From its base is 45°, how much higher must the tower be raised so that its angle of elevation at the same point may be 60°? (Take $\sqrt{3} = 1.73$)

or

The angle of elevation of a cloud from a point 60m above a lake is 30^0 and the angle of depression of the reflection of the cloud in the lake is 60^0, Find the height at the cloud. |

| Q.29 | Mr. Mohan takes 1 hour less when his speed is increased by 15 km/hr than its usual speed for a journey of 300 km. Find the usual speed of the Mr. Mohan. |

| Q.30 | Water is flowing at the rate of 5km per hour through a pipe of diameter 14 cm into a rectangular tank which is 25 m. long and 22m wide. Determine the time in which the level of water in the tank will rise by 21cm.

or

The height of a come is 40cm. A same come is cut off at the top by plane parallel to the base. If the volume of the small can be 1/64 of the volume of the given cane, at what height above the base is the section made. |

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