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TARGET MATHEMATICS
THE EXCELLENCE KEY
AGYAT GUPTA (M.Sc., M.Phil.)



CODE:2201-AG-FT-2-SA-2

REGNO:-TMC-D/79/89/36/63

GENERAL INSTRUCTIONS :

- All questions are compulsory.
- The question paper consists of 31 questions divided into four sections A,B,C and D. Section – A comprises of 4 question 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.
- Use of calculator is not permitted.

सामान्य निर्देश :

- सभी प्रश्न अनिवार्य हैं।
- इस प्रश्न पत्र में 31 प्रश्न हैं, जो 4 खण्डों में अ, ब, स व द हैं। खण्ड – अ में 4 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड – ब में 6 प्रश्न हैं और प्रत्येक प्रश्न 2 अंको का है। खण्ड – स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंको का है। खण्ड – द में 11 प्रश्न हैं और प्रत्येक प्रश्न 4 अंको का है।
- कैलकुलेटर का प्रयोग वर्जित है।
- कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 4 हैं।
- प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए कोड नम्बर को छात्र उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें।

MATHEMATICS CLASS X (SA-2)

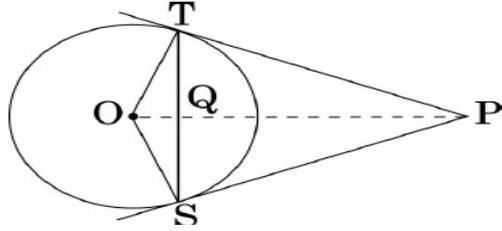
Time : 3 to 3 1/4 Hours Maximum Marks : 90

PRE-BOARD EXAMINATION 2016 -17

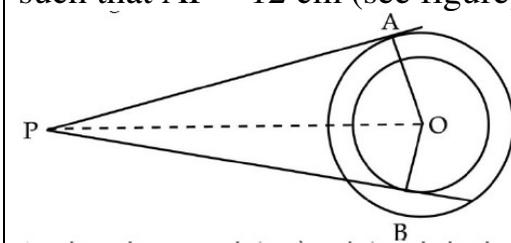
SECTION A

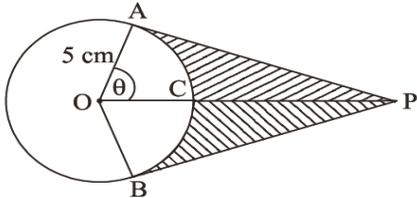
Q.1 Solve for x: $\sqrt{3}x^2 - 2\sqrt{2}x - 2\sqrt{3} = 0$.

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Q.2	A tower stands vertically on the ground. From a point on the ground which is 20 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60°. Find the height of the tower.
Q.3	A letter of English alphabets is chosen at random. Determine the probability that the latter is a consonant.
Q.4	In what ratio does the point P(2, -5) divide the line segment joining A(-3, 5) and B(4,-9)?
SECTION B	
Q.5	Find the area of the quadrilateral whose vertices taken in order are A (-5, -3), B (-4, -6), C (2, -1) and D (1, 2).
Q.6	For an AP show that $a_p + a_{p+2q} = 2a_{p+q}$.
Q.7	A circle touches the side BC of a ΔABC at a point P and touches AB and AC when produced at Q and R respectively. Show that: $AQ = \frac{1}{2}(\text{Perimeter of } \Delta ABC)$.
Q.8	 <p>In fig. , from an external point P, two tangents PT and PS are drawn to a circle with center O and radius r. If $OP=2r$, shown that $\angle OTS = \angle OST = 30^\circ$.</p>
Q.9	All Aces, Jacks and Queens are removed from a deck of playing cards. One card is drawn at random from the remaining cards. Find the probability that the card drawn is : (a) a face card (b) not a face card.
Q.10	The length of the tangent from a point A at a distance of 5 cm from the centre of the circle is 4 cm. What will be the radius of the circle?
SECTION C	

Q.11	Find the area of the sector of a circle with radius 4 cm and of angle 30° .also find the area of the corresponding major sector. .
Q.12	A solid metallic right circular cone 20 cm high with vertical angle 60° is cut into two parts at the middle point of its height by a plane parallel to the base. If the frustum, so obtained, be drawn into a wire of diameter $\frac{1}{3}$ mm, find the length of the wire.
Q.13	The Points A(2, 9), B(a, 5), C(5, 5) are the vertices of a triangle ABC right angled at B. Find the value of 'a' and hence the area of $\triangle ABC$.
Q.14	A field is in the form of a circle. A fence is to be erected around the field. The cost of fencing would be ₹ . 2640 at the rate of ₹ 12 per metre. Then the field is to be thoroughly ploughed at the cost of ₹ 0.50 per m^2 . What is the amount required to plough the field ?
Q.15	How many terms of the A.P. $- 6, -\frac{11}{2}, - 5, \dots$ are needed to give the sum $- 25$? Explain double answer.
Q.16	Solve for x : $\frac{1}{(x-1)(x-2)} + \frac{1}{(x-2)(x-3)} = \frac{2}{3}$, $x \neq 1, 2, 3$
Q.17	An agriculture field is in the form of a rectangle of length 20m width 14m . A 10m deep well of diameter 7m is dug in a corner of the field and the earth taken out of the well is spread evenly over the remaining part of the field. Find the rise in its level.
Q.18	From a point P, two tangents PA and PB are drawn to a circle with centre O. If OP is equal to the diameter of the circle, prove that $\triangle PAB$ is equilateral.
Q.19	There are 150 persons working in a factory out of which 80 are able to form judgments 15 are able to reason. Find the probability of persons: (i) who are able to form judgment? (ii) who are able to reason ?(iii) which moral values are reflected here ?

Q.20	A bucket of height 8 cm and made up of copper sheet is in the form of frustum of a right circular cone with radii of its lower and upper ends as 3 cm and 9 cm respectively. Calculate: (a) the height of the cone of which the bucket is a part. (b) the volume of water which can be filled in the bucket. (c) the area of copper sheet required to make the bucket.(Leave the answer in terms of π)
SECTION D	
Q.21	A two-digit number is such that product of its digits is 18. Where 63 is subtracted from the number, the digits interchange their places. Find the number.
Q.22	A boy standing on a horizontal plane finds a bird flying at a distance of 100m from him at an angle of elevation 30° . A girl standing on the roof of 10m high building finds the angle of elevation of the same bird, at the same time, to be 45° . Both the boy and the girl are on opposite sides of the bird. Find the distance of bird from the girl.
Q.23	Draw a circle of radius 4.5 cm. Take a point P on it. Construct a tangent at the point P without using the centre of the circle. Write the steps of construction .
Q.24	If one root of $ax^2 + 10x + 5 = 0$ is three times the other then find the value of a . .
Q.25	Two concentric circles are of radii 5 cm and 3 cm and centre at O. two tangents PA and PB are drawn to two circles from an external point P such that AP = 12 cm (see figure). 
Q.26	A vertical tower stands on a horizontal plane and is surmounted by

	vertical flag staff of height 5 meters. At a point on the plane, the angle of elevation of the bottom and the top of the flag staff are respectively 30° and 60° find the height of tower.
Q.27	A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows : Rs. 200 for first day, Rs. 250 for second day, Rs. 300 for third day and so on. If the contractor pays Rs. 27,750 as penalty, find the number of days for which the construction work is delayed.
Q.28	Find the coordinates of the point which is at a distance of 2 units from (5,4) and 10 units from (11,-2) .
Q.29	An elastic belt is placed around the rim of a pulley of radius 5 cm. (Fig.  Fig. 10). From one point C on the belt, the elastic belt is pulled directly away from the centre O if the pulley until it is at P, 10 cm from the point O. Find the length of the belt that is still in contact with the pulley. Also find the shaded area. (Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)
Q.30	Find the middle term of the sequence formed by all three-digit numbers which leave a remainder 5 when divided by 7. Also find the sum of all number on both sides of the middle term separately
Q.31	A copper wire 4 mm in diameter is evenly bound about a cylinder whose length is 24 cm and diameter 20 cm so as to cover the whole surface. Find the length of the wire in terms of π .

	" STAY POSITIVE , WORK HARD AND MAKE IT HAPPEN "

ADMISSION /SCHOLARSHIP TEST

**FOR JEE (MAIN & ADVANCE)/ AIPMT
CLASS-X AND XI STUDENTS**

SUNDAY, 29TH JANUARY 2017

**SCHOLARSHIP
UP-TO 100%**

SELECTION-2016

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IIT Main 84

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