

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 है। खण्ड – अ में 4 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड – ब में 6 प्रश्न हैं और प्रत्येक प्रश्न 2 अंको के हैं। खण्ड – स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंको का है। हैं। 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 6 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 $\frac{1}{4}$ Hours

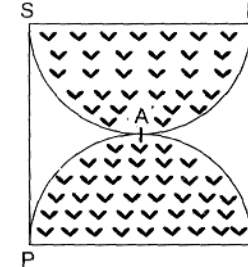
Maximum Marks : 90

PRE-BOARD EXAMINATION 2014 -15

SECTION A

- Q.1** In what ratio does the point P(2, -5) divide the line segment joining A(-3, 5) and B(4,-9)?

- Q.2** PQRS is a square land of side 28 m, Two semicircular grass covered portions are to be made on two of its opposite sides as shown in Figure 4. How much area will be left uncovered?



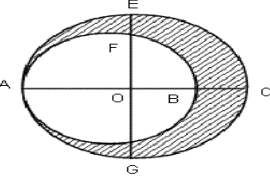
(Take $\pi = 22/7$)

Fig. 4

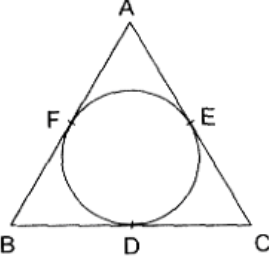
- Q.3** Find a point on the y-axis which is equidistant from the points A(6,5) and B(- 4, 3).
- Q.4** The length of the tangent from a point A at a distance of 5 cm from the centre of the circle is 4 cm. What will be the radius of the circle?

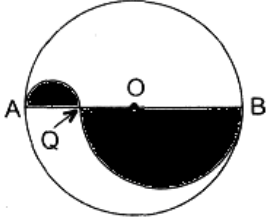
SECTION B

- Q.5** Solve for x : $\frac{x-1}{x-2} + \frac{x-3}{x-4} = 3\frac{1}{3} (x \neq 2,4)$.
- Q.6** Determine an A.P. whose 3rd term is 16 and when 5th term is subtracted from the 7th term, we get 12.
- Q.7** A bag contains 5 red balls, 8 green balls and 7 white balls. One ball is drawn at random from the bag. Find the probability of getting :
 (i) a white ball or a green ball.
 (ii) neither a green ball nor a red ball.
- Q.8** 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.9** 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).

<p>Q.10</p>	<p>In the given figure, O is the centre of the bigger circle and AC is its diameter. Another circle with AB as diameter is drawn. If AC=54 cm and BC=10 cm, Find the area of the shaded region.</p> 
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SECTION C

<p>Q.11</p>	<p>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 ΔABC.</p>
<p>Q.12</p>	<p>In Fig. 3 the in-circle of ΔABC touches the sides BC, CA and AB at D, E, and F respectively. If AB = AC, prove that BD = CD.</p> 




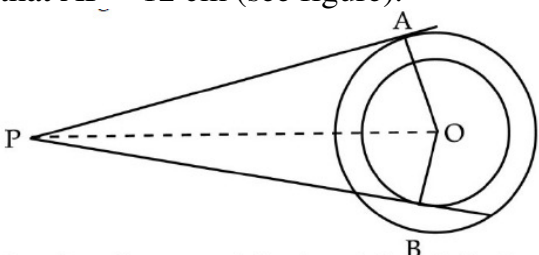
<p>Q.13</p>	<p>Find the area of the shaded region of Fig. 8, if the diameter of the circle with centre O is 28 cm and $AQ = \frac{1}{4} AB$.</p>  <p style="text-align: center;">Fig. 8</p>
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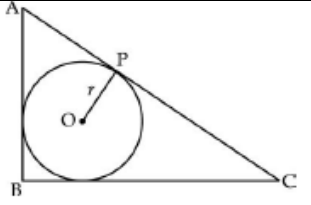
<p>Q.14</p>	<p>A vertical tower stands on a horizontal plane and is surmounted by vertical flag staff of height 5 meters. At a point on the plane, the angle of elevation of the bottom and the top of the flag staff are respectively 30° and 60° find the height of tower.</p>
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<p>Q.15</p>	<p>If the 10th term of an A.P. is 47 and its first term is 2, find the sum of its first 15 terms.</p>
<p>Q.16</p>	<p>The coordinates of the vertices of ΔABC are A (4,1), B (-3, 2) and C (0, k). Given that the area of ΔABC is 12 units², find the value of k.</p>
<p>Q.17</p>	<p>Prove that sum of n term of A . P . is $S_n = \frac{n}{2} [2a + (n - 1)d]$.</p>
<p>Q.18</p>	<p>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.</p>
<p>Q.19</p>	<p>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 .</p>
<p>Q.20</p>	<p>A cottage industry produces a certain number of pottery articles in a day. It was observed on a particular day that the cost of production of each article was 3 more than twice the number of articles produced on that day. If the total cost of production on that day was Rs. 90 find the number of articles produced and the cost of each article.</p>

SECTION D

<p>Q.21</p>	<p>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.</p>
<p>Q.22</p>	<p>A container (open at the top) made up of a metal sheet is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm respectively. Find : (i) the cost of milk when it is completely Filled with milk at the rate of Rs. 15 per litre. (ii) the cost of metal sheet used, if it costs Rs. 5 per 100 cm². (Take $\pi = 3.14$)</p>
<p>Q.23</p>	<p>If two tangents are drawn to a circle from an external point, then (i) They subtend equal angles at the centre. (ii) They are equally inclined to the segment, joining the centre to that point.</p>
<p>Q.24</p>	<p>Ramesh ,a jucie seller has set up his juice shop . He has three types of</p>

	<p>glasses of inner diameter 5 cm to serve the customers. The heights of the glasses is 10 cm (use $\pi = 3.14$)</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>TYPE A</p> </div> <div style="text-align: center;">  <p>TYPE B</p> </div> </div> <p>A glass with plane bottom . TYPE B A glass with hemispherical raised bottom .</p> <div style="text-align: center;">  <p>TYPE C</p> </div> <p>A glass with conical raised bottom of height 1.5 cm .He decided to serve the customer in A type of glasses .(i)Find the volume of glass of type A . (ii) Which glass has the minimum capacity .(iii) Which mathematical concept is used in above problem (iv)By choosing the glass of type A , which value is depicted by juice seller ramesh ?</p>
Q.25	A solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 100 cm and the diameter of the hemispherical ends is 28 cm, find the cost of polishing the surface of the solid at the rate of 5 paise per sq cm.
Q.26	<p>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).</p> 
Q.27	Solve for x: $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x} ; a \neq 0, b \neq 0, x \neq 0.$
Q.28	From the top and foot of a tower 40 m high, the angle of elevation of the top of a lighthouse is found to be 30° and 60° respectively. Find the height of the lighthouse. Also find the distance of the top of the lighthouse from the foot of the tower.
Q.29	In given figure, ΔABC is right angled at B. $AB = 6$ cm, $BC = 8$ cm. find the

	 <p>radius r of the circle inscribed</p>
Q.30	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.31	The interior of a building is in the form of a right circular cylinder of radius 7 m and height 6m, surmounted by a right circular cone of same radius and of vertical angle 60° . Find the cost of painting the building from inside at the rate of Rs. 30/m ² .

<u>HAPPINESS IS NOTHING MORE THAN GOOD HEALTH AND A BAD MEMORY.</u>	