



**CODE:- AG-TS-6-3636**

पजियन क्रमांक

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

**GENERAL INSTRUCTIONS :**

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections A,B,C and D. Section – A comprises of 8 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 10 questions of 4 marks each.
3. Question numbers 1 to 8 in Sections – A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four mark each. You have to attempt only one If the alternatives in all such questions.
5. Use of calculator is not permitted.

**सामान्य निर्देश :**

1. सभी प्रश्न अनिवार्य हैं।
2. इस प्रश्न पत्र में 34 प्रश्न हैं, जो चार खण्डों में अ, ब, स व द में विभाजित हैं। खण्ड – अ में 8 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। खण्ड – द में 10 प्रश्न हैं और प्रत्येक प्रश्न 4 अंको का है।
3. प्रश्न संख्या 1 से 8 बहुविकल्पीय प्रश्न हैं। दिए गए चार विकल्पों में से एक सही विकल्प चुनें।
4. इसमें कोई भी सर्वोपरि विकल्प नहीं है, लेकिन आंतरिक विकल्प 1 प्रश्न 2 अंको में, 3 प्रश्न 3 अंको में और 2 प्रश्न 4 अंको में दिए गए हैं। आप दिए गए विकल्पों में से एक विकल्प का चयन करें।
5. कैलकुलेटर का प्रयोग वर्जित है।
6. इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है। इस अवधि के दौरान छात्र केवल प्रश्न-पत्र को पढ़ेंगे और वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे।

**PRE-BOARD EXAMINATION 2012 -13**

**MATHEMATICS**

**CLASS X**

**(SA- 2)**

Time : 3 to 3 1/4 Hours

अधिकतम समय : 3 से 3 1/4

Maximum Marks : 90

अधिकतम अंक : 90

Total No. Of Pages : 4

कुल पृष्ठों की संख्या : 4

**SECTION A**

**Q.1** If the roots of equation  $3x^2 + 2x + (p + 2)(p - 1) = 0$  are of opposite sign then which of the following can not be the value of p?

- (a) 0      (b) -1      (c)  $\frac{1}{2}$       (d) -3

**Ans. d**

**Q.2** If the third term of an AP is 12 and the seventh term is 24, then the 10<sup>th</sup> term is

- (a) 34      (b) 35      (c) 36      (d) 33

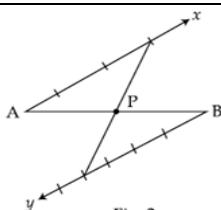
**Ans. d**

**Q.3** Two players ranvir and ranjit play table tennis. the probability of ranjit winning the match is 0.58. what is the probability of ranvir winning the match ?

- (a) 0.58      (b) 0.36      (c) 0.42      (d) 0.18

**Ans. C**

**Q.4**



In Fig . P divides AB internally in the ratio : (a) 3 : 4 (b) 4:3 (c) 3:7 (d) 4:7 **Ans (a)**

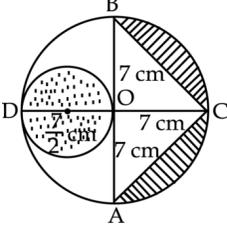
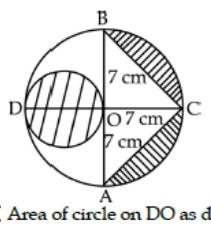
Q.5	The difference between the circumference and the radius of a circle is 37 cm. The area of circle is (a) $149\text{cm}^2$ (b) $154\text{cm}^2$ (c) $121\text{cm}^2$ (d) $169\text{cm}^2$ <b>Ans b</b>
Q.6	The midpoint of the line joining the points $(2p+2, 3)$ and $(4, 2q+1)$ are $(2p, 2q)$ . Find the values of p and q. (a) $p = 3$ & $q = 2$ (b) $p = 2$ & $q = 3$ (c) $p = -2$ & $q = 3$ (d) none of these <b>Ans (a)</b>
Q.7	A tangent PQ at a point P of a circle of radius 7cm meets a line through centre O at a point Q so that $OQ = 25\text{cm}$ length PQ is (a) 20cm (b) 14cm (c) 24cm (d) 26cm <b>Ans c</b>
Q.8	An aero plane is flying horizontally $1500\sqrt{3}$ m above the ground is observed at an angle $60^\circ$ from a point on the ground. After 15 sec. of flight the angle of elevation is observed to be $30^\circ$ . Find the speed of the aero plane in km / h . (a) 720 km/ h ( b ) 360 km / h ( c ) 7200 km / h ( d ) none of these <b>Ans. A</b>
<b>SECTION B</b>	
Q.9	Point P divides the line segment joining the points A( 2 , 1) and B( 5 , -8) such that $\frac{AP}{BP} = \frac{1}{3}$ . If P lies on the line $2x - y + k = 0$ , find the value of k .
Q.10	Solve the following quadratic equation: $(a+b)^2 x^2 - (a+b)x - 6 = 0, (a+b \neq 0)$ . <b>Ans <math>x = \frac{3}{a+b}, \frac{-2}{a+b}</math></b>
Q.11	The diameter of a roller 120 cm long is 84 cm. If it takes 500 complete revolutions to level a playground, determine the cost of leveling it at the rate of 30 paise per square meter. <b>Ans. Total area in 500 revolution = 1584 sq m &amp; total cost = 475 .20</b> OR The circumference of a circle exceeds its diameter by 16.8 cm. Find the radius of circle. <b>Ans. R = 3. 92 cm</b>
Q.12	In an equilateral triangle of side 24 cm , a circle is inscribed touching its sides . Find the area of remaining portion of the triangle.[use $\sqrt{3} = 1.732$ ] . <b>Ans; Radius of circle <math>4\sqrt{3}\text{cm}</math> Area of incircle = 150.85 sq cm &amp; Area of triangle = 249.4 sq cm There fore Area of remaining portion of triangle = 98.55 sq cm</b>
Q.13	A bag contains 12 balls out of which x are white. (i) If one ball is drawn at random, what will be the probability that it will be a white ball?(ii) If 6 more white balls are put into the bag, the probability of drawing a white ball will double than that in (i) Find x . <b>Ans.(i) <math>x / 12</math> ( ii ) 3</b>
Q.14	In what ratio does the point $\left(\frac{11}{6}, \frac{17}{6}\right)$ divide the join of A (1, 2) and B(3, 4). <b>Ans.5 : 7</b>
<b>SECTION C</b>	
Q.15	The in circle of $\triangle ABC$ touches the sides BC, CA and AB at D, E and F respectively. If $AB = AC$ , prove that $BD = CD$ .
Q.16	The wheels of a car are of diameter 140cm each. How many complete revolution per minute must the wheel make in order to keep a speed of 66km/ hour ? <b>Ans.Number of revolution per minute 250</b>
Q.17	There are 150 persons working in a factory out of which 80 are able to from judgments 15 are able to reason. Find the probability of persons: (i) who are able to from judgment? (ii) who are able to reason ?(iii) which moral values are reflected here ? <b>Ans: (i) <math>\frac{1}{2}</math> (ii) <math>\frac{1}{10}</math> (iii) Persons are able to form judgment and able to reason . (There can be multiple answers to the value based questions. Students may have their own opinion about answering them, there is no specific solution. Marks would be given for all sensible answers.).</b>
Q.18	The sum of first three term of an AP is 33 . If the product of the first and third term exceeds the second term by 29 , find the AP.

	$\frac{3}{2}[2a + 2d] = 33$ $2a + 2d = 22$ $a + d = 11 \Rightarrow d = 11 - a$ $a(a + 2d) = a + d + 29$ $a^2 + 2a(11 - a) = 40 \Rightarrow a^2 + 22a - 2a^2 = 40$ $a^2 - 22a - 40 = 0$ $a = 20, 2$ $a = 20 \qquad a = 2$ $d = -9 \qquad d = 9$ $\text{A.P.} = 20, 11, 2, \dots \quad \text{or} \quad 2, 11, 20, \dots$	<p>1</p> <p>1</p> <p>1</p>
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**Q.19** Draw a circle of radius 4 cm and construct a pair of tangent to the circle which are inclined to each other at Construct a  $30^\circ$ .

**Q.20** The radius of the base and the height of solid right circular cylinder are in the ratio 2:3 and its volume is 1617cu. cm. find the total surface area of the cylinder. **Ans 770 cm**  
 OR  
 A cone of height 24cm and radius of base 6cm. is made up of modeling clay. A child reshapes it in the form of a sphere. Find the radius of the sphere. **Ans r = 6cm**

**Q.21** AB and CD are two diameters of a circle perpendicular to each other and OD is the diameter of the smallest circle. If OA= 7 cm. Find the area of the shaded region.

**ANS:** Area of circle on DO as diameter  
 $= \pi r^2 = \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = \frac{77}{2}$  sq. cm  
 Area of semicircle on AB as diameter  
 $= \frac{\pi R^2}{2} = \frac{22 \times 7 \times 7}{7 \times 2} = 77$  sq. cm  
 Area of  $\Delta ABC = \frac{1}{2} \times 14 \times 7 = 49$  sq. cm  
 Area of shaded region = a. of circle on DO + A. of semi circle on BA - a. of  $\Delta ABC$   
 $= \frac{77}{2} + 77 - 49 = 66.5$  sq. cm

OR

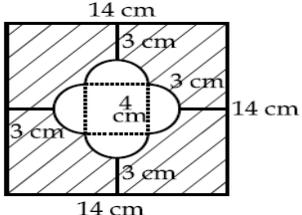
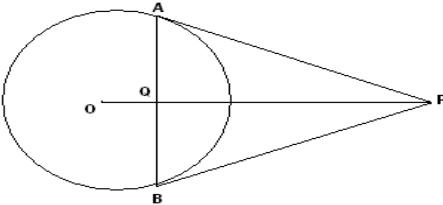
The wheels of a car are of diameter 80 cm each. How many complete revolutions does each wheel make in 10 minutes when the car is traveling at a speed of 66 km per hour?  
**Ans 4375**

**Q.22** Prove that the intercept of a tangent between two parallel tangents to a circle subtends a right angle at the centre.

**Q.23** Find the coordinates of the point which is at a distance of 2 units from (5 , 4) and 10 units from(11,-2) . **Ans. ( 3,4) & ( 5 , 6 )**

**Q.24** Prove using coordinate a line joining the middle points of a triangle is one half of its third side.  
 OR  
 Find the center of circle of circle passing through the vertices of triangle whose sides are  $x + y = 2$  ;  $3x - 4 y - 6 = 0$  , and  $x - y = 0$  . **Ans Solve linear equation and point of intersection of triangle are ( 1 , 1 ) ; ( 2 , 0 ) & ( -6 , -6) . Using PA = PB = PC .Center ( -2 , -3 )**

**SECTION D**

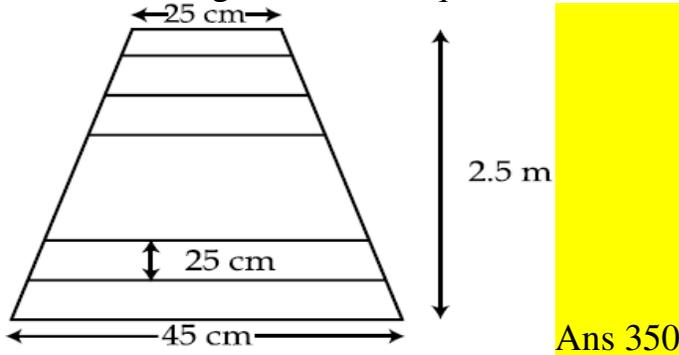
Q.25	From a window 15 meters high above the ground in a street , the angles of elevation and depression of the top and foot of another house on the opposite side of the street are $30^\circ$ and $45^\circ$ respectively . Show that the height of the opposite house is 23.66 meters. (take $\sqrt{3} = 1.732$ )
Q.26	The radius of the in circle of a triangle is 2 cm and the segments into which one side is divided by the point of contact are 3 cm and 4 cm . Determine the other two sides of triangle. <b>Ans sides are 6.5 cm &amp; 7.5 cm</b>
Q.27	<p>If twice the area of a smaller square is subtracted from the area of a larger square, the result is 14 sq cm. However, if twice the area of the larger square is added to three times of area of the smaller square, the result is 203 sq cm. Determine the sides of the two squares. <b>Ans <math>y^2 - 2x^2 = 14</math> &amp; <math>2y^2 + 3x^2 = 203</math> . Sides 5 and 8 cm</b></p> <p style="text-align: center;">OR</p> <p>Two pipes running together can fill a cistern in <math>3\frac{1}{13}</math> minutes .if one pipe takes 3 minutes more than the other to fill the cistern, find the time in which each pipe would fill the cistern. <b>Ans <math>\frac{1}{x} + \frac{1}{x+3} = \frac{13}{40}</math> slower pipe 5 minutes and longer pipe 8 minutes</b></p>
Q.28	<p>A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: ₹ 200 for I day, ₹ .250 for II day, ₹ 300 for III day and so on., How much does a delay of 30 days cost the contractor . If the contractor completes the construction on time, what values he reflects? <b>Ans : a = 200 ; d = 50, n = 30 ; <math>S_n = \frac{30}{2}[2 \times 200 + 29 \times 50] = 27750</math> . Thus , a delay of 30 days will cost the contractor of Rs. 27750 . Ans Required penalty= Rs 27750 value which are reflected by contractor, if he completes the work on time is reliability and punctuality . <i>(There can be multiple answers to the value based questions. Students may have their own opinion about answering them, there is no specific solution. Marks would be given for all sensible answers.)</i></b></p>
Q.29	<p>Find the area of shaded region in fig. in term of <math>\pi</math> .</p>  <p><b>Ans <math>180 - 8rcm^2 = 154.88cm^2</math></b></p>
Q.30	<p>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. <b>Ans</b></p> <p><b><math>h = \frac{2 \times 385}{483} = \frac{770}{483} = 1.594 m</math></b></p>
Q.31	<p>Prove that the lengths of tangents drawn from an external point to a circle are equal. Making use of the above, prove the following: From an external point P, two tangents PA and PB are drawn to a circle with centre O as shown in figure. Show that OP is the perpendicular bisector of AB.</p> 
Q.32	From the top of a building 15m high, the angle of elevation of the top of a tower is

found to be  $30^\circ$ . From the bottom of the same building, the angle of elevation of the top of the tower is found to be  $60^\circ$ . Determine the height of the tower and the distance between the tower and building.  $h = 22.5$  &  $d = 12.99$

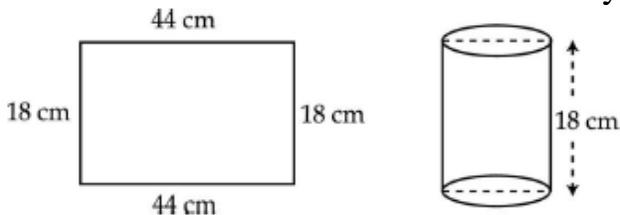
OR

The shadow of a vertical tower on level ground increases by 10 metres, when the altitude of the sun changes from angle of elevation  $45^\circ$  to  $30^\circ$ . Find the height of the tower, correct to one place of decimal. (Take  $\sqrt{3} = 1.73$ )  $h = 5(\sqrt{3} + 1) = 13.65m$

**Q.33** A ladder has rungs 25cm apart. The rungs decreased uniformly in length from 45cm at the bottom to 25cm at the top (see figure). If the top and bottom rungs are 2.5m apart, what is the length of wood required for the rungs?



**Q.34** A rectangular sheet of paper of dimensions 44 x 18 cm is rolled along its length to form a cylinder. Find the volume of the cylinder so formed. (Use  $\pi = 22/7$ ) ANS:



The paper is rolled along length, therefore, 44 cm forms the circumference of base of cylinder

$$\begin{aligned} \therefore 2\pi r &= 44 \Rightarrow r = 7 \text{ cm} \\ \therefore \text{volume of the cylinder} &= \pi r^2 h \\ &= \frac{22}{7} \times (7)^2 \times 18 \\ &= 2772 \text{ cm}^3 \end{aligned}$$

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**BELIEVE ONE WHO HAS PROVED IT. BELIEVE AN EXPERT**