



CODE:3012- AG-PB-3

पजियन क्रमांक

REG.NO:-TMC -D/79/89/36

General Instructions :-

- (i) All Question are compulsory :
- (ii) This question paper contains **40** questions.
- (iii) Question **1-20** in **PART-A** are Objective type question carrying **1** mark each.
- (iv) Question **21-26** in **PART-B** are sort-answer type question carrying **2** mark each.
- (v) Question **27-34** in **PART-C** are long-answer-I type question carrying **3** mark each.
- (vi) Question **35-40** in **PART-D** are long-answer-II type question carrying **4** mark each
- (vii) You have to attempt only one If the alternatives in all such questions.
- (viii) Use of calculator is not permitted.
- (ix) Please check that this question paper contains 8 printed pages.
- (x) 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.

PRE-BOARD EXAMINATION 2019 -20

Time : 3 Hours

Maximum Marks : 80

CLASS - X

MATHEMATICS

PART - A (Question 1 to 20 carry 1 mark each.)

SECTION I : Single correct answer type

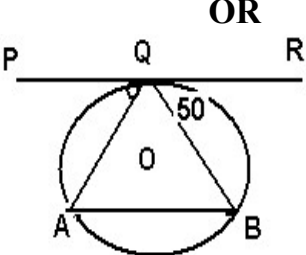
This section contain 10 multiple choice question . Each question has four choices (A) , (B) , (C) &(D) out of which ONLY ONE is correct .

Q.1	If a, b are coprime, then a^2, b^2 are :						
	(a) Coprime (B) Not coprime (c) Odd numbers (d) Even numbers						
Q.2	For the following distribution The modal class is :						
	Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
	No. of students	3	12	27	57	75	80
	(A) 10 - 20 (B) 20 - 30 (C) 30 - 40 (D) 50 - 60						
Q.3	Given that HCF of (2520, 6600) =40 and LCM (2520, 6600) =252 * k, then the value of k is (A)1650 (B) 1600 (C) 165 (D) 1625						

Q.4	For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines? (a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) 2 (d) -2
Q.5	The value of $5 \tan^2 \theta - 5 \sec^2 \theta$ is : (a) 1 (b) -5 (c) 0 (d) 5
Q.6	If $\cos 9\alpha = \sin \alpha$, then the value of α a. 20° b. 0° c. 9° d. 30°
Q.7	If two trees of height 'x' and 'y' standing on the two ends of a road subtend angles of 30° and 60° and respectively at the mid point of the road, then the ratio of x : y is a. 1 : 3 b. 1 : 2 c. 3 : 1 d. 1 : 1
Q.8	The distance of the point (h,k) from x-axis is (a) h (b) h (c) k (d) k
Q.9	The distance between $(at^2, 2at)$ and $(\frac{a}{t^2}, \frac{-2a}{t})$ is a. $(t^2 + \frac{1}{t^2})$ units b. $a(t - \frac{1}{t})^2$ units c. $a(t + \frac{1}{t})^2$ units d. $(t + \frac{1}{t})^2$ units
Q.10	If $p(\frac{a}{3}, 4)$ is the mid-point of the line segment joining the points $Q(-6, 5)$ and $R(-2, 3)$, then the value of a is 4 (b) -12 (c) 12 (d) -6
(Q11 – Q15) Answer the following questions	
Q.11	Express the number $.3\overline{178}$ in the form of rational number $\frac{a}{b}$.
Q.12	The zeros of a quadratic polynomial $f(x) = x^2 - 7x + k$ are α & β such that $\alpha - \beta = 3$. Then the value of k (a) 9 (b) -10 (c) 10 (d) none. OR The polynomials $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$ when divided by $(x - 4)$ leaves remainders R_1 & R_2 respectively then value of 'a' if $2R_1 - R_2 = 0$. (A) $-\frac{18}{127}$ (B) $\frac{18}{127}$ (C) $\frac{17}{127}$ (D) $-\frac{17}{127}$
Q.13	If two poles 2 m and 8 m high are 100 m apart, then the height of the point of intersection of the line joining the top of each pole to the foot of the opposite pole is (a) 1.4 m (b) 1.6 m (c) 1.7 m (d) 1.2 m.

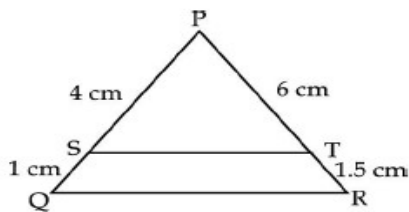
Q.14	If for an A.P. $T_4 + T_8 = 24$ and $T_6 + T_{10} = 34$, then first term = (a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) $-\frac{1}{2}$ (d) $-\frac{3}{2}$
Q.15	There are two children's in a family. The probability that both of them are boys is ----- ----- .

Fill in the blanks (Q16 – Q20)

Q.16	If the diameter of the base of a closed right circular cylinder be equal to its height 'h' then its total surface area is-----
Q.17	If $\Delta ABC \sim \Delta QRP$, $\frac{ar(ABC)}{ar(PQR)} = \frac{9}{4}$, AB=18 cm and BC=15 cm; then PR is equal to (a) 10 cm (b) 12 cm (c) $\frac{20}{3}$ cm (d) 8 cm. .
Q.18	The length of the tangent PA from a point P to a circle of a radius 3 CM is 4 cm. the distance of A from the center of the circle is: 5 cm (B) $\sqrt{7}$ cm (C) 25 cm (D) 7 cm OR  In given figure, if PQR is a tangent to a circle at Q whose center is O, AB is a chord parallel to PR and $\angle BQR = 50^\circ$ then $\angle AQB$ is equal to :- 80° (B) 40° (C) 20° (D) 50°
Q.19	Which term of the A.P. 113, 108, 103, Is the first negative term? (A) 22 nd term (B) 24 th term (C) 26 th term (D) 28 th term
Q.20	The value of a and b such that $3x^4 + 5x^3 - 7x^2 + ax + b$ is divisible by $x^2 + 3x + 1$ give the remainder $3x + 5$ (a) $a = 5$, $b = -7$ (b) $a = -5$, $b = 7$ (c) $a = 5$, $b = 7$ (d) none .

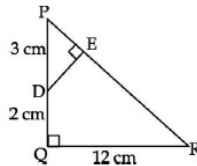
PART – B (Question 21 to 26 carry 2 mark each.)

Q.21	The sum of the first four terms of an A.P. is 56. The sum of the last four terms is 112. If its first term is 11, then find the number of terms.
Q.22	In the figure, ABC is an isosceles triangle in which AB = AC. A circle through B touches the side AC at D and intersect the side AB at P. If D is the midpoint of side AC, Then AB = 4AP.
Q.23	In the given figure PS, SQ, PT and TR are 4 cm, 1 cm, 6 cm, and 1.5 cm respectively, prove that ST QR. Also, find the ratio of $\frac{ar(\Delta PST)}{ar(Trap QRTS)}$



OR

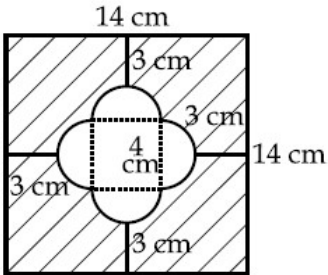
In the given figure, $\triangle PQR$ is right angled triangle right angled at Q. $DE \perp PR$. Prove $\triangle PQR \sim \triangle PED$ and find the lengths of PE and DE if $PD = 3$, $QD = 2$ cm and $QR = 12$ cm.



- Q.24** A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60° . Find the time taken by the car to reach the foot of the tower from this point.
- Q.25** A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball from the bag is four times that of red ball. Find the number of blue ball in the bag.
- Q.26** A conical empty vessel is to be filled up completely by pouring water into it successively with the help of a cylindrical can of diameter 6 cm and height 12 cm. The radius of the conical vessel is 9 cm and its height is 72 cm. How many times will it required to pour water into the conical vessel to fill it completely, if, in each time, the cylindrical can is filled with water completely ?
- OR
- An iron solid sphere of radius 3 cm is melted and recast into small spherical balls of radius 1 cm each. Assuming that there is no wastage in the process, find the number of small spherical balls made from the given sphere.

PART – C (Question 27 to 34 carry 3 mark each.)

- Q.27** Prove that $(3 + 2\sqrt{5})^2$ is an irrational number.
- OR
- Show that the square of any positive integer is of the form $4q$ or $4q + 1$ for some integers q.
- Q.28** Find the middle term of the sequence formed by all three-digit numbers which leave a remainder 3, when divided by 4. Also find the sum of all numbers on both sides of the middle term separately.
- Q.29** It can take 12 hours to fill a swimming pool using two pipes. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter for 9 hours, only half the pool can be filled. How long would it take for each pipe to fill the pool separately?

	<p>OR</p> <p>The ages of two friends Ani and Biju differ by 3 years. Ani's father Dhatam is twice as old as Ani and Biju is twice as old as his sister Cathy. The ages of Cathy and Dharam differ by 30 years. Find the ages of Ani and Bijy.</p>														
Q.30	<p>Sum of the two zeroes of a polynomial of degree 4 is - 1 and their product is - 2. If other two zeroes are $\sqrt{3}$ & $-\sqrt{3}$. Find the polynomial .</p>														
Q.31	<p>Find the coordinates of the point which is at a distance of 2 units from (5,4) and 10 units from(11,-2) .</p>														
Q.32	<p>Prove that : $\frac{1}{\sec A + \tan A} - \frac{1}{\cos A} = \frac{1}{\cos A} - \frac{1}{\sec A - \tan A}$</p> <p>OR</p> <p>If $\cot B = \frac{12}{5}$, prove that $\tan^2 B - \sin^2 B = \sin^4 B \cdot \sec^2 B$.</p>														
Q.33	<div style="text-align: center;">  </div> <p>In Fig. , find the area of the shaded region [Use $\pi = 3.14$]</p>														
Q.34	<p>Calculate the median for the following distribution class :</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td style="background-color: #cccccc;">Class</td> <td>0-10</td> <td>10-20</td> <td>20-30</td> <td>30-40</td> <td>40-50</td> <td>50-60</td> </tr> <tr> <td style="background-color: #cccccc;">Frequency</td> <td>5</td> <td>10</td> <td>20</td> <td>7</td> <td>8</td> <td>5</td> </tr> </tbody> </table>	Class	0-10	10-20	20-30	30-40	40-50	50-60	Frequency	5	10	20	7	8	5
Class	0-10	10-20	20-30	30-40	40-50	50-60									
Frequency	5	10	20	7	8	5									
<p>PART – D (Question 35 to 40 carry 4 mark each.)</p>															
Q.35	<p>Construct a Δ PQR, in which PQ = 6 cm, QR = 7 cm and PR = 8 cm. Then, construct another triangle whose sides are $\frac{4}{5}$ times the corresponding sides of ΔPQR .</p>														
Q.36	<p>BL and Cm are medians of ΔABC right angled at A. Prove that $4(BL^2 + CM^2) = 5 BC^2$</p> <p>OR</p> <p>O is any point inside a rectangle ABCD (shown in the figure). Prove that $OB^2 + OD^2 = OA^2 + OC^2$</p>														
Q.37	<p>A motor boat whose speed is 18 km/hr in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the t\stream.</p> <p>OR</p>														

	Solve : $\frac{a}{ax-1} + \frac{b}{bx-1} = a + b$.																		
Q.38	<p>From a solid cylinder whose height is 7cm and radius 6cm, a conical cavity of height 7cm and base radius 6cm is taken out. Find the volume of the remaining solid.</p> <p style="text-align: center;">OR</p> <p>An oil funnel of tin sheet consists of a cylindrical portion 10 cm long attached to a frustum of a cone. If the total height be 22cm, diameter of the cylindrical portion be 8cm and the diameter of the top of the funnel be 18cm, find the area of the tin required to make the funnel.</p>																		
Q.39	<p>If the angle of elevation of cloud from a point h meters above a lake is α and the angle of depression of its reflection in the lake is β, prove that the distance of the cloud from the point of observation is $\frac{2h \sec \alpha}{\tan \beta - \tan \alpha}$.</p>																		
Q.40	<p>The following table shows the marks obtained by 100 students of Class X in a school during a particular academic session. Find the mode of this distribution.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #cccccc;">Marks</th> <th>Less than 10</th> <th>Less than 20</th> <th>Less than 30</th> <th>Less than 40</th> <th>Less than 50</th> <th>Less than 60</th> <th>Less than 70</th> <th>Less than 80</th> </tr> </thead> <tbody> <tr> <th style="background-color: #cccccc;">No. of students</th> <td>7</td> <td>21</td> <td>34</td> <td>46</td> <td>66</td> <td>77</td> <td>92</td> <td>10</td> </tr> </tbody> </table>	Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80	No. of students	7	21	34	46	66	77	92	10
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" THE TWO MOST POWERFUL WARRIORS ARE PATIENCE AND TIME "																			