



CODE:2712- AG-PB-2

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

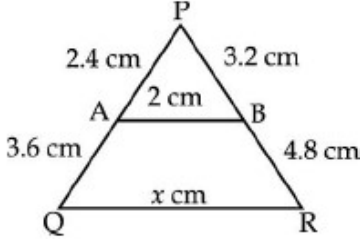
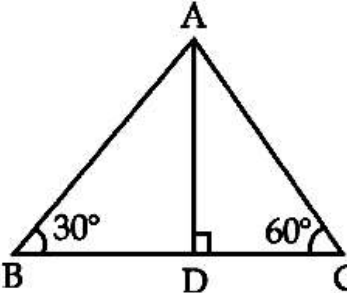
MATHEMATICS

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

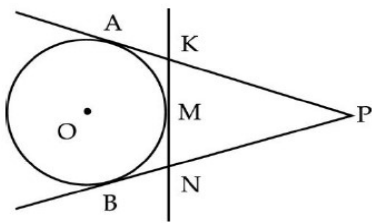
SECTION I : Single correct answer type

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** 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.2** The upper limit of the median class of the following distribution is :
- | | | | | | |
|------------|-----|------|-------|-------|-------|
| Classes. | 0-5 | 6-11 | 12-17 | 18-23 | 24-29 |
| Frequency. | 13 | 10 | 15 | 8 | 11 |
- (A) 17 (B) 17.5 (C) 18 (D) 18.5
- Q.3** Find the largest number which divides 445, 572 and 699 leaving remainders 4, 5 and 6 respectively .(A) 61(B)62 (C) 63 (D) none

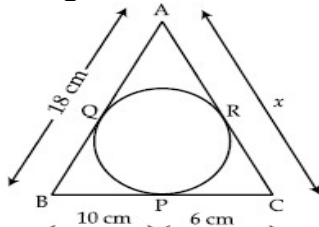
Q.4	<p>The condition so that the pair of linear equations $kx + 3y + 1 = 0, 2x + y + 3 = 0$ has exactly one solution.</p> <p>(a) $k = 6$ (b) $k \neq 6$ (c) $k = 3$ (d) $k \neq 3$</p>
Q.5	<p>In the given figure, value of x (in cm) is :</p> <div style="text-align: center;">  </div> <p>(a) 4 (b) 5 (c) 6 (d) 8</p>
Q.6	<p>$\cos(40^\circ + \theta) - \sin(50^\circ - \theta) + \frac{\cos^2 40^\circ + \cos^2 50^\circ}{\sin^2 40^\circ + \sin^2 50^\circ} =$</p> <p>(a) 1 (b) -1 (c) 2 (d) 0</p>
Q.7	<p>The positive value of y for which the distance between the points $P(2, -3)$ and $Q(10, y)$ is 10 units, is (a) 2 (B) 4 (C) 3 (D) 1</p>
Q.8	<p>Distance between the points $(a \sin 15^\circ, 0)$ and $B(0, a \sin 75^\circ)$ is (A) a^2 (B) $\sqrt{a^2}$ (C) $-a$ (D) a</p>
Q.9	<p>In the given figure, if $AD = 7\sqrt{3}$ m, then BC is equal to:</p> <div style="text-align: center;">  </div> <p>(A) 14 m (B) 27 m (C) 29 m (D) 28 m</p>
Q.10	<p>A circle drawn with origin as the center passes through $(\frac{13}{2}, 0)$. The point which does not lie in the interior of the circle is:</p> <p>(A) $(-\frac{3}{4}, 1)$ (B) $(2, \frac{7}{3})$ (C) $(5, -\frac{1}{2})$ (D) $(-6, \frac{5}{2})$</p>
<p>(Q11 – Q15) Answer the following questions</p>	
Q.11	<p>What is the smallest number which when increased by 6 becomes divisible by 36, 63 and 108?</p>
Q.12	<p>In the given figure, ΔPQR is right angled triangle right angled at Q. $DE \perp PR$. Prove $\Delta PQR \sim \Delta PED$ and find the lengths of PE and DE if $PD = 3$, $QD = 2$ cm and $QR = 12$ cm.</p>

Q.13	<p>In given figure, P if AP is a tangent to the circle with center O such that $OP = 4$ cm and $\angle OPA = 30^\circ$, then AP is equal to: 4 cm (B) 2 cm (C) $2\sqrt{3}$ cm (D) $4\sqrt{3}$ cm</p>
Q.14	Which term of the A.P. 113, 108, 103, Is the first negative term?
Q.15	If one zero of quadratic equation $(2k + 3)x^2 + (3k - 8)x + 2k + 1 = 0$ is reciprocal of the other, then find the zeroes and value of k.
Fill in the blanks (Q16 – Q20)	
Q.16	<p>A toy is in the form of a right circular cylinder surmounted by a right circular cone as shown in the figure. If $AD = DE = DC = 1$ cm, the volume of the toy in cm^3 is:</p> <p>(A) $\frac{4}{3}\pi$ (B) $\frac{3}{4}\pi$ (C) 3π (D) 4π</p>
Q.17	<p>If α, β are the roots of the equation $x^2 - 3x + 2 = 0$, then the equation whose roots are $(\alpha + 1)$ and $(\beta + 1)$ is -----</p> <p style="text-align: center;">or</p> <p>Find a quadratic polynomial whose zeros are $3 + \sqrt{5}$ and $3 - \sqrt{5}$.</p>
Q.18	In a $\triangle ABC$, D and E are points on the sides AB and AC respectively such that $DE \parallel BC$. If $AD = 2.5$ cm, $BD = 3.0$ cm and $AE = 3.75$ cm, then $AC = \dots\dots$
Q.19	The sum of first 'n' terms of the series a, 3a, 5a, Is: -----
Q.20	The set of all possible outcomes of a random experiment is called (a) sample space (b) elementary events (c) complementary events (d) favorable events
PART – B (Question 21 to 26 carry 2 mark each.)	
Q.21	Is $7^5 \times 3^2 \times 5 + 3$ a composite number? Justify your answer.
Q.22	PA and PB are tangents from point P to the circle with center O as shown in figure. At point M, a tangent is drawn cutting PA at K and PB at N. prove that $KN = AK + BN$.

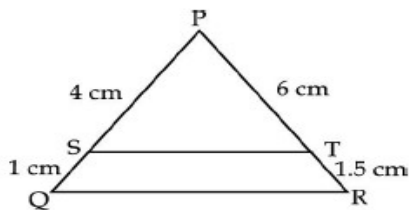


OR

In Fig. , all three sides of a triangle touch the circle. Find the value of x.



- 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 $ST \parallel QR$. Also, find the ratio of $\frac{ar(\Delta PST)}{ar(Trap QRTS)}$



OR

In ΔABC , if $AD \perp BC$ and $AD^2 = BD \times DC$, prove that $\angle BAC = 90^\circ$.

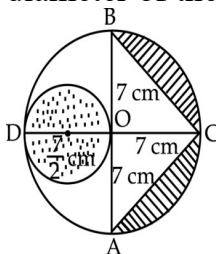
- Q.24** Two pillars of equal height are on either side of a road, which is 100m wide. The angles of elevation of the top of the pillars are 60° and 30° at a point on the road between the pillars. Find the position of the point between the pillars and the height of each pillar

- Q.25** Five cards- the ten, jack, queen, king and ace of diamond : are well – shuffled with their face downwards. One card is then picked up at random.

a. What is the probability that the card is the queen?

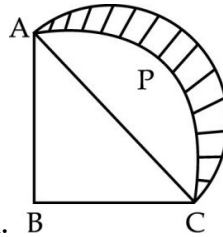
If the queen is drawn and put aside, what is the probability that the second card picked up is (a) an ace? (b) a queen?

- Q.26** 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.



OR

ABCP is a quadrant of a circle of radius 14 cm. With AC as diameter a semicircle is



drawn. Find the area of the shaded region. B C

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

Q.27 The length, breadth and height of a room are 8m 25cm, 6m 75cm and 4m 50 cm, respectively. Determine the longest rod which can measure the three dimensions of the room exactly.

OR

Determine the prime factors of 45470971.

Q.28 In an A.P. the sum of first n term is $\frac{3n^2}{2} + \frac{5n}{2}$, find its 25th term.

Q.29 Solve the following system of equation graphically. $X - 2y = 5$ & $2x - 4y - 10 = 0$.

Q.30 The zeros of a quadratic polynomial $p(x) = 2x^2 + x + m$ are α & β . find the value of m if $\alpha^2 + \beta^2 + \alpha\beta = \frac{13}{4}$.

Q.31 Prove that coordinates of the centroid of a triangle ABC, with vertices (x_1, y_1) , (x_2, y_2) and (x_3, y_3) are given by $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$.

Q.32 Prove that $(\cos \theta + \sec \theta)^2 + (\sin \theta + \operatorname{cosec} \theta)^2 = 7 + \tan^2 \theta + \cot^2 \theta$.

OR

Prove that : $\sin A(1 + \tan A) + \cos A(1 + \cot A) = \sec A + \operatorname{cosec} A$.

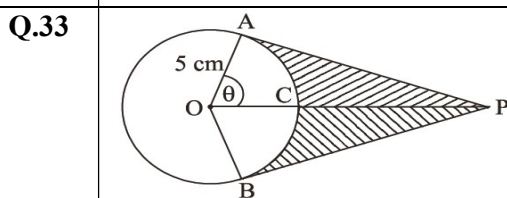


Fig. 10

An elastic belt is placed around the rim of a pulley of radius 5 cm. (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 $\sqrt{3} = 1.73$)

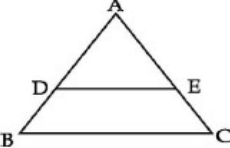
Q.34 Find the mean for the following distribution :

	Marks	10-20	20-30	30-40	40-50	50-60	60-70	70-80
	Frequency	6	8	13	7	3	2	1

PART – D (Question 35 to 40 carry 4 mark each.)

Q.35 Draw a circle of radius 3 cm. Take a point A on its extended diameter at a distance of 7 cm from its centre. Draw two tangents to the circle from A.

Q.36 The perpendicular from A on the side BC of a ΔABC intersects BC at D , such that $DB = 3 CD$. Prove that $2AB^2 = 2AC^2 + BC^2$.
OR
In given figure in ΔABC , $DE \parallel BC$ such that $\text{ar}(\Delta ADE) = \text{ar}(BCED)$. Then prove that



$\frac{BD}{AB} = \frac{2 - \sqrt{2}}{2}$.

Q.37 Two numbers m & n are such that the quadratic equation $mx^2 + 3x + 2n = 0$ has - 6 as the sum of the roots & also as the product of the roots. Find m &n .
OR
Out of the number of saras birds. $\frac{1}{4}$ th of the number are moving about in lots , $\frac{1}{9}$ th coupled with $\frac{1}{4}$ th as well as 7 times the square root of the number move on a hill and 56 birds remain in the vakula trees. What is the total umber of birds?

Q.38 A solid toy is in the form of a hemispherical surmounted by a right circular cone. The height of the cone is 2cm and the diameter of the base is 4cm. determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volume of the cylinder and toy. (Use $\pi = 3.14$)
OR
A hemispherical tank of radius $1\frac{3}{4}$ is full of water. It is connected with a pipe which empties it at the rate of 7 liters per second. How much time will it take to empty the tank completely ?

Q.39 From a point P on the ground, the angles of elevation of the top of a 20m tall building and of a helicopter, covering at some height above the top of the building are 30° and 60° respectively. Find the height at which the helicopter is hovering (above the ground)

Q.40 The marks obtained by 400 students in medical entrance exam are given in the following table.

Marks Obtained	400-450	450-500	500-550	550-600	600-650	650-700	700-750	750-80
No. of Examinees	30	45	60	52	54	67	45	47

- (i) Draw Ogive by less than method.
(ii) Draw Ogive by more than method.
(iii) Find the number of examinees, who have obtained the marks less than 625.
(iv) Find the number of examinees, who have obtained 625 and more than marks.

" THE TWO MOST POWERFUL WARRIORS ARE PATIENCE AND TIME "