TARGET MATHEMATICS by Dr. AGYAT GUPTA
The Excellence Key...
(M.Sc, B.Ed., M.Phill, P.hd)

CODE:0601- AG-PB-5 पंजियन 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** areObjective 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 lf 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	Find the biggest number which can divide both 324 and 144. (A) 18(B) 36(C) 9(D) 21
Q.2	An 'ogive' is used to determine a. mode b. None of these c. median d. mean
Q.3	Which one of the following can't be the square of a natural number? (A) 42437(B) 20164(C) 81225(D) 32761
Q.4	For what value of $k: 4x+6y=1$ and $2x+ky=7$ are inconsistent? (a) $k=2$ (b) $k=3$ (c) $k=4$ (d) $k=-2$
Q.5	Area of the shaded portion in the following figure is equal to area of.

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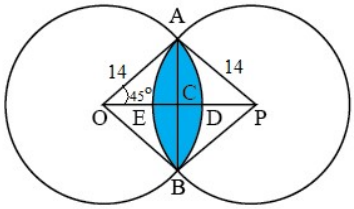
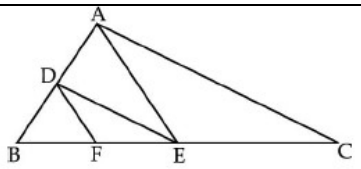
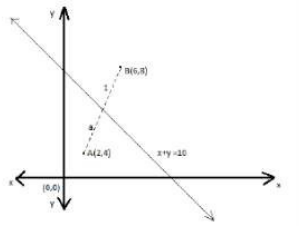
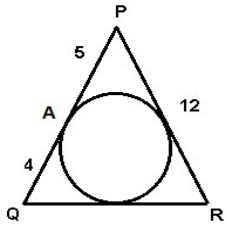
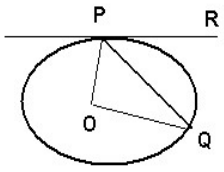
	 (A) sector OADBO - segment ADBA (B) segment AEBA (C) segment ADBA (D) segments ADBA and AEBA
Q.6	A statue, 2 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45°. Find the height of the pedestal. (A) $2\left(\sqrt{3}+1\right)$ (B) $2\left(\sqrt{3}-1\right)$ (C) $\frac{1}{2\sqrt{3}}$ (D) $\frac{\sqrt{3}+1}{2}$
Q.7	If p cotθ = $\sqrt{q^2-p^2}$ then the value of sinθ is ___. (θ being an acute angle) (A) q/3p (B) q/2p (C) p/q (D) 0
Q.8	Point P lies on the line 3x+ 4y - 12 = 0. If X- coordinate of P is a, then its y-coordinate is (A) (12-3a) / 4 (B) (12-4a)/ 3 (C) (12+3a)/4 (D) (3a-12)/4 .
Q.9	What is the probability of getting all heads or all tails, when three coins are tossed simultaneously? (A) ¾(B) ½(C) ¼(D) 1/8
Q.10	If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find x and y. (A) (2,3)(B) (4,3)(C) (6,3)(D) (2,5)
(Q11 – Q15) Answer the following questions	
Q.11	For what value of n, are the nth terms of two AP's: 63, 65, 67 .... and 3, 10, 17,.. equal?
Q.12	If α & β are the zeroes of the polynomial $x^2+3x-10$, then the sum of polynomial whose zeroes are $\frac{1}{2\alpha+\beta}$ & $\frac{1}{\alpha+2\beta}$ is a) $s=\frac{-9}{8}$ (b) $s=-\frac{8}{9}$ (c) $s=\frac{9}{8}$ (d) none . OR If the sum of the zeros of the polynomial $f(x)=(k^2-14)x^2-2x-12$ is 1, then one of the value of k is (a) $\sqrt{14}$ (b) $-\sqrt{14}$ (c) 2 (d) - 4
Q.13	In given figure DE||AC, DF||AE. If the lengths of BF and FE in centimeters and 4 and 5 respectively, then find the length of EC.

	
Q.14	If $3x = \text{cosec}\,\theta$ = and $\frac{3}{x} = \cot\theta$ find the value of $3\left(x^2 - \frac{1}{x^2}\right)$
Q.15	The line x + y = 10 divides line segment AB in the ratio a: 1. Find the value of a.  (A) ½(B) 1(C) 2(D) 3
Fill in the blanks (Q16 – Q20)	
Q.16	The HCF of two numbers is 23 and their LCM is 1449. If one of the numbers is 161, Then the other number ---------
Q.17	In a ΔABC, D and E are points on the sides AB and AC respectively such that $DE \| \| BC$ .If AD= 4x -3 ,AE = 8x – 7 , BD = 3x -1 and CE = 5x -3, then x = ----------
Q.18	 In figure ΔPQR is circumscribing a circle if PA = 5 cm. AQ = 4 cm PR = 12 cm then the length of QR is ……. OR  In given figure, O is the center of the circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ. The $\angle POQ$ is equal to……
Q.19	Find the sum of all the non-negative terms of the following sequence: 100, 97, 94, ……
Q.20	Solve : $\frac{2x}{x-3} + \frac{1}{2x+3} + \frac{3x+9}{(x-3)(2x+3)} = 0.$
PART – B (Question 21 to 26 carry 2 mark each.)	
Q.21	Find the sum of first 22 terms of an AP in which d = 7 and the 22nd term is 149.

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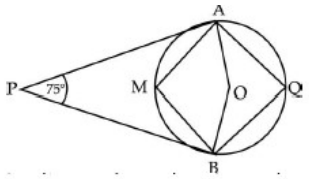
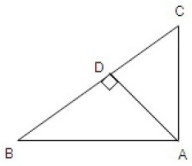
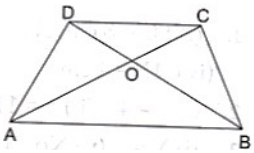
Q.22	In the given figure Q is the center of the circle. Determine $\angle AQB$ and $\angle AMB$, if PA and PB are tangents and, $\angle APB = 75^\circ$ 
Q.23	In the given figure, if AD ⊥ **BC**, prove that $AB^2 + CD^2 = BD^2 + AC^2$.  OR  In the given figure, ABCD is a trapezium in which AB ‖ DC and its diagonals intersect at O. If AO = (5x – 7), OC = (2x + 1) , BO = (7x – 5) and OD = (7x + 1), find the value of x.
Q.24	From the top of a light house, angles of depression of two ships are 45 and 60. The ships are on opposite side of the light house and in line with its foot. If the distance between the ships is 400 m, find the height of the light house.
Q.25	24 cards numbered 1, 2, 3, ..., 23, 24 are put in a box and mixed thoroughly. One person draws a card from the box. The probability that the number on the card is divisible by 2 or 3 or both .
Q.26	How many gold coins of 1.75cm in diameter and 2mm in thickness can be melted to form a cuboid of dimensions 5.5cm x 10cm x 3.5cm? OR A solid metallic sphere of diameter 21 cm is melted and recast into a number of smaller cones, of diameter 3.5 cm and height 3cm. Find the number of cones so formed .
PART – C (Question 27 to 34 carry 3 mark each.)	
Q.27	Prove that √2 is irrational number . **OR** Three sets of English, Mathematics and Science books containing 336, 240 and 96 books respectively have to be stacked in such a way that all the books are stored subject wise and the height of each stack is the same. How many stacks will be there?
Q.28	The interior angles of a polygon are in arithmetic progression. The smallest angle is 120^0 and the common difference is 5. Find the number of sides of the polygon.

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Q.29 The area of a rectangle get reduced by 9 square unit, if its length is reduced by 5 unit and the breadth is increased by 3unit if we increase the length by 3 unit and the breadth by 2 units, then the area is increased by 67 square unit. Find the length and the breadth of the rectangle.

OR

While covering a distance of 30 km. Ajeet takes 2 hours more than Amit. If Ajeet doubles his speed, he would take 1 hour less than Amit. Find their speeds of walking.

Q.30 Find all the zeros of the polynomial $f(x) = 2x^4 - 2x^3 - 7x^2 + 3x + 6$, if two of its zeros are $-\sqrt{\frac{3}{2}}$ and $\sqrt{\frac{3}{2}}$.

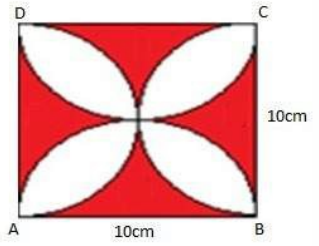
Q.31 The line segment joining the points A (3,-4) and B (1,2) is trisected at the point P and Q . If the co-ordinate of p and q are (p,-2) and $\left(\frac{5}{3}, q\right)$ where P nearer to A and Q nearer to B Find the values of p and q .

Q.32 Prove that : $\frac{\cot^2\theta(sec\,\theta-1)}{(1+\sin\theta)}+\frac{\sec^2\theta(\sin\theta-1)}{(1+\sec\theta)}=0$

OR

If $x = \cot A + \cos A$ and $y = \cot A - \cos A$ then prove that $\left(\frac{x-y}{x+y}\right)^2+\left(\frac{x-y}{2}\right)^2=1$

Q.33



Find the area of the shaded region

Q.34 Draw on O-give for the following frequency distribution by less than method and also find its median from the graph.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
Number of students	7	10	23	51	6	3

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

Q.35 Draw a quadrilateral ABCD with AB = 3 cm, AD = 2.7 cm, DB = 3.6 cm, $\angle B = 110^0$ and BC = 4.2 cm. Construct a quadrilateral A'BC'D similar to the quadrilateral ABCD so that the diagonal D'B may be 4.8.

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	OR Draw a circle with the help of a bangle. Take any point P outside the circle. Construct the pair of tangents form the point P to the circle without using the center .
Q.36	State and prove Converse of Pythagoreans Theorem . OR In ΔABC, AB = AC. Side BC is produced to D. Prove that $AD^2 - AC^2 = BD \times CD$.
Q.37	If the roots of the equation $(b - c)x^2 + (c - a)x + (a - b) = 0$ are equal, then prove that $2b = a + c$. OR A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average speed of 6 km/h more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed ?
Q.38	If the diameters of the circular ends of a bucket which is 16cm height are 40cm and 16cm, find the capacity and the total surface area of the bucket. **OR** 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 $\pi = 3.14$)
Q.39	The angle of elevation of an airplane from a point on the ground is 60^0. After a flight of 30 seconds, the angle of elevation becomes 30^0. If the airplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of the airplane.
Q.40	Daily wages of 110 workers, obtained in a survey, are tabulated below: CI | 100-120 | 120-140 | 140-160 | 160-180 | 180-200 | 200-220 | 220-240 F | 10 | 15 | 20 | 22 | 18 | 12 | 13 Compute the mean daily wages and modal daily wages of these workers.
	" THE TWO MOST POWERFUL WARRIORS ARE PATIENCE AND TIME "

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