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

CODE:2312- AG-PB-1
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** 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 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

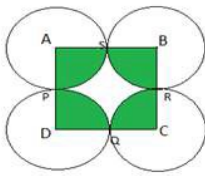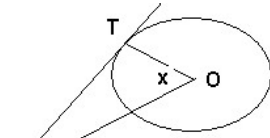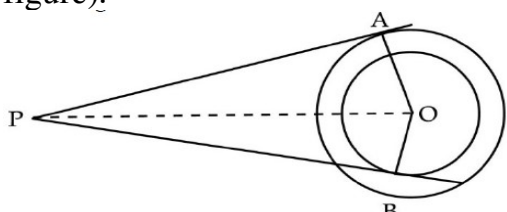| Time : 3 Hours	Maximum Marks : 80
CLASS – X	**MATHEMATICS**

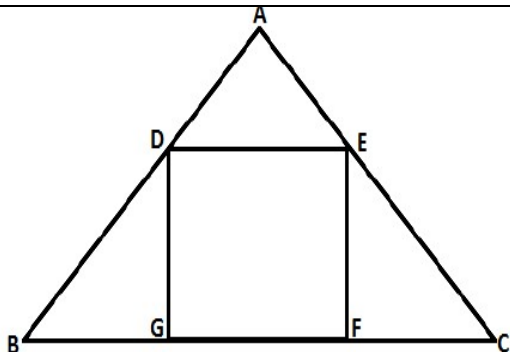**PART – A** (Question 1 to 20 carry 1 mark each.)

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 .
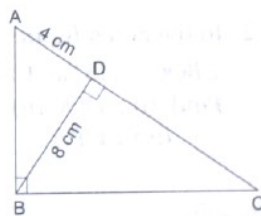
Q.1	If x and y are the two digits of the number 653xy such that this number is divisible by 80,then x + y =? A) 4 or 8 (B) 6 (C) 4 (D) 8m
Q.2	If mode of a data is 45 and median is 33 , then mean is (a) 30(b) 27(c) 33 (d) None of these
Q.3	Find the HCF of 1848, 3058 and 1331. (A) 9(B) 14(C) 13(D) 11
Q.4	For what value of k, do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines?

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	(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) 2 (d) -2
Q.5	If tan2A = cot(A-18°), then value of A is: (A) 27°(B) 24°(C) 36°(D) 18°
Q.6	A TV tower stands vertically on a bank of a canal, with a height of $10\sqrt{3}$ m . From a point on the other bank directly opposite the tower, the angle of elevation of the top of the tower is 60°. From another point on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30°. Find the distance between the opposite bank of the canal and the point with 30° angle of elevation. (A) 30m (B) 20m (C) 45m (D) 35m
Q.7	 Given below is a combination figure of square ABCD of side 26cm and four circles. Find the area of the shaded region. (A) 530.64 cm2 (B) 402.83cm2 (C) 360cm2 (D) 480.53cm2
Q.8	Name the type of triangle formed by the points A (-5, 6), B (-4,-2) and C (7, 5). (A) Equilateral triangle (B) Scalene triangle (C) Isosceles triangle (D) Right-angled triangle
Q.9	A number is chosen at random among the first 100 natural numbers. Find the probability that the number chosen is prime. (A) ¼(B) 3/10(C) 29/100(D) 27/100
Q.10	The points on X-axis at a distance of 10 units from (11, –8) are (A) (5, 2) (17, 0)(B) (5, 0) (17, 0)(C) (6, 0) (17, 0)(D) (5, 0) (16, 0)
	(Q11 – Q15) Answer the following questions
Q.11	Find the sum of first 51 terms of an AP whose second and third terms are 14 and 18 respectively.
Q.12	Is it possible to have two numbers whose HCF is 18 and LCM is 760? Give reason.
Q.13	ABC is a triangle. PQ is a line segment intersecting AB in p and AC in Q such that PQ // BC and divides $A(\triangle APQ) = 2A(PQCB)$. Then, BP : AB is (a) $\sqrt{2}:\sqrt{3}$ (b) $\sqrt{3}:\sqrt{2}$ (c) $\sqrt{3}-\sqrt{2}:\sqrt{3}$ (d) none
Q.14	Evaluate: $\cot^2 30^0 - 2\cos^2 30^0 - \frac{3}{4}\sec^2 45^0 + \frac{1}{4}\csc^2 30^0$
Q.15	If (3, 0), (2, a) and (b, 6) are the vertices of a triangle ABC whose centroid is (2, 5). Then the values of (a , b) ………………
	Fill in the blanks (Q16 – Q20)

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Q.16	If $x^2 + 4x + k = 0$ has real roots, then k is always ------------
	OR
	On dividing $-2x^3 + 9x^2 - 22x + 19$ by a polynomial g (x) , the quotient and remainder were $3 - 2x \& -3x + 4,$ respectively . Then g (x) = ------
Q.17	Two triangles ABC and PQR are similar, if BC : CA : AB = 1 : 2 : 3 , then $\dfrac{QR}{PR}$ is
	(a) $\dfrac{2}{3}$ (b) $\dfrac{1}{2}$ (c) $\dfrac{1}{\sqrt{2}}$ (d) $\dfrac{2}{3}$
Q.18	PQ is drawn parallel to the base BC of a ΔABC cutting AB at P and AC at Q. If AB = 4BP and CQ = 2 cm, then AQ is equal to :
	(a) 2 cm (b) 4 cm (c) 6 cm (d) 8 cm
	OR
	In the above given figure, PT is a tangent of circle with center O and $\angle TPO = 25°.$ the value of x is
	(A) $25°$ (B) $65^\bullet$ (C) $115°$ (D) $90°$
Q.19	The sum of four consecutive numbers in an A.P. with d > 0 is 20. Sum of their square is 120, then the middle terms are ………………
Q.20	If the product of the zeros of the polynomials $f(x) = ax^3 - 6x^2 + 11x - 6$ is 4 , then a = -------------
	PART – B (Question 21 to 26 carry 2 mark each.)
Q.21	What is the sum of all 3 digit numbers that leave a remainder of '2' when divided by 3?
Q.22	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).
Q.23	In the given figure, DEFG is a square and $\angle$ BAC = 90^0 . Show that FG^2= BG x FC

OR

In the given figure , ∠ABC = 900 and BD⊥AC. If BD = 8cm, AD = 4cm, find CD.

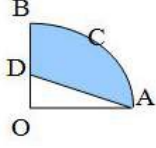| Q.24	An electric pole is 10m high. A steel wire tied to top of the pole is affixed at a point on the ground to keep the pole up right. If the wire makes an angle of 45° with the horizontal through the foot of the pole, find the length of the wire.
Q.25	Find the probability of getting 53 Fridays in a leap year. OR Two dice are thrown at the same time. Find the probability of getting different values on both.
Q.26	A cylindrical tank is filled by pumping water from a cuboidal tank of dimensions 200cm × 150cm × 95 cm. The radius of the cylindrical tank is 60cm and height is 95cm. Find the height (in m) of the water left in the cuboidal tank after the cylindrical tank is completely filled. (Take π = 3.14) OR A piece of cloth is required to completely cover a solid object. The solid object is composed of a hemisphere and a cone surmounted on it. If the common radius is 7 m and height of the cone is 1 m, what is the area of cloth required?

<div align="center">

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

</div>

| Q.27	Find the HCF and LCM of $\frac{8}{9}, \frac{10}{27}$ and $\frac{16}{81}$. **OR** Find the greatest possible length which can be used to measure exactly the lengths 7m, 3m 85cm and 12m 95cm.
Q.28	How many terms of the A.P. : -15, -13, -11, …… are needed to make the sum -55?

	Explain the reason for double answer?
Q.29	Solve for x and y: $\dfrac{1}{2(x+2y)}+\dfrac{5}{3(3x-2y)}=-\dfrac{3}{2}, \dfrac{5}{4(x+2y)}-\dfrac{3}{5(3x-2y)}=\dfrac{61}{60}$ Or The perimeter of a rectangle is 52 cm, where length is 6 cm more than the width of the rectangle. Form the pair of linear equations for the above situation and find the dimensions of the rectangle graphically.
Q.30	What real number should be subtracted from the polynomial $8x^4+14x^3+x^2+7x+8$ so that the polynomial $4x^2-3x+2$ divides it exactly?
Q.31	The segment AB is divided into 4 equal parts. C is nearer to A and E is nearer to B. Find the co-ordinates of A and B, if the co-ordinates of C, D and F are (5/2,-1/2), (3, 0) and (7/2, 1/2) respectively.
Q.32	If $(\cos\theta+\sin\theta)=\sqrt{2}\sin\theta,$ prove that $(\sin\theta-\cos\theta)=\sqrt{2}\cos\theta.$ OR If sin (A+B) = sin A cos B + cos A sin B find $\sin(75^0)$
Q.33	In the given figure below, OACB is a quadrant of a circle. The radius OA = 3.5 cm, OD = 2 cm. Calculate the area of the shaded region.
Q.34	Find the missing frequency *f* if the mode of the given data is 154 	Class	120-130	130-140	140-150	150-160	160-170	170-180	|---|---|---|---|---|---|---|	Frequency	2	8	12	f	8	7	
	PART – D (Question 35 to 40 carry 4 mark each.)
Q.35	Construct an isosceles triangle ABC with base BC = 6 cm , AB = AC and $\angle A=90.$ Draw another similar triangle whose sides are $\dfrac{4}{5}$ times of the sides of $\triangle ABC$. Justify your construction.
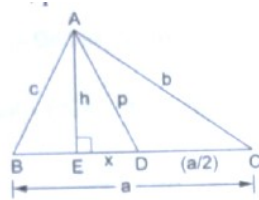
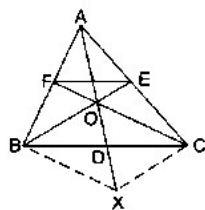| Q.36	In the given figure [figure] , D is the midpoint of side BC and AE⊥BC. If BC = a, AC = b, AB = c, AD = p and AE = h, prove that (i) $b^2 = p^2 + ax + \dfrac{a^2}{x}$ (ii) $c^2 = p^2 - ax + \dfrac{a^2}{x}$ (iii) $b^2 + c^2 = 2p^2 + \dfrac{a^2}{2}$ (iv) $b^2 - c^2 = 2ax$ OR In the given figure [figure] , side BC of a ΔABC is bisected at D and O is any point on AD. BO and CO produced meet AC and AB at E and F respectively, and AD is produced to X so that D is the midpoint of OX. Prove that AO : AX = AF : AB and show that EF∥BC.
Q.37	The sum of the square of two positive integers is 208. If the square of the larger number is 18 times the smaller number, find the numbers . **OR** Determine the possible value of 'k' for which the equation $x^2 + kx + 64 = 0$ and $x^2 + 8x - k = 0$ will both have real and equal roots.
Q.38	A bucket is in the form of a frustum of a cone whose radii of bottom and top are 7cm and 28 cm respectively. If the capacity of the bucket is 21560 cm^3 . Find the whole surface area of the bucket. OR A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ of the curved surface of the whole cone, find the ratio of the line segment into which the cone's altitude is divided by the plane.
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	Find the mean, mode and median of the following data :						
	CI	0-10	10-20	20-30	30-4.0	40-50	50-60	60-70
	F	5	10	18	30	20	12	5
	" THE TWO MOST POWERFUL WARRIORS ARE PATIENCE AND TIME "						