# 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

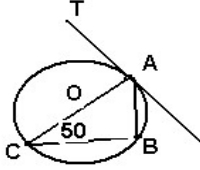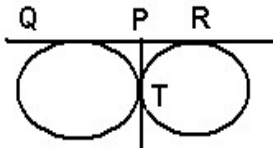**PART – A** (Question 1 to 20 carry 1 mark each.)

### 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** | Product of any three consecutive numbers is always divisible by <br> (a) 6 (b) 10   (c) 15     (d) none . |
| **Q.2** | If mode of a data is 45 and median is 33 , then mean is <br> (a) 30 (b) 27 (c) 33   (d) None of these |
| **Q.3** | L.C.M. of a and b, if ab=1050 and H.C.F. of a and b is 15, is <br> (a)  60    (b)   70        (c)  80     (d)   75 |
| **Q.4** | If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of $k$ is <br> (a) $-\dfrac{5}{4}$     (b) $\dfrac{2}{5}$     (c) $\dfrac{15}{4}$        (d) $\dfrac{3}{2}$ |

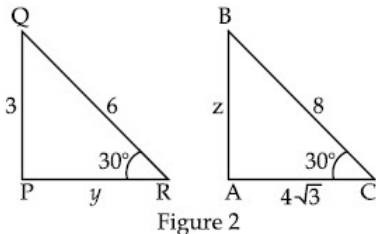| Q.5 | If in $\triangle ABC$, $AD \perp BC$, and $BD : DA = DA : DC$, then which of the following angle is a right triangle <br> (a) $\angle ABC$ **(b)** $\angle BAC$ **(c)** $\angle CAD$ **(d)** $\angle BAD$ |
|---|---|
| Q.6 | A girl sitting on the balcony is looking down at a flower pot placed on ground, then the angle formed by her line of sight with the horizontal is called…. <br> (A)Angle of elevation (B)Angle of depression(C) reflex angle (D)complete angles |
| Q.7 | If the co – ordinates of the middle point of the line segment joining the points (2, 1) and (1, -3) be $(\alpha, \beta)$, then which of the following is true? <br><br> (A) $\alpha + \beta - 1 = 0$              (B) $6\alpha + \beta = 8$ <br><br> (C) $\alpha + 6\beta - 8 = 0$           (D) $\alpha + \beta - 8 = 0$ |
| Q.8 | If the points (x,y), (2, 3) and (-3, 4) are collinear, then <br> (A)x + y = 17   (B)x – y = 17    (C)x – 5y = 17   (D)x + 5y = 17 |
| Q.9 | If $\cos A + \cos^2 A = 1, then \sin^2 A + \sin^4 A =$ <br> (a) -1   (b) 2 (c) 1(d) none of these |
| Q.10 | The Points D, E, F are the mid – point of the sides BC, CA and AB of triangle ABC respectively. if the coordinates of A, D and E are (-2, 3), (1, -4) and (-5, 2) respectively, then the coordinates of F are <br> (A)(4, 3)    (B) (4, -3)    (C) (-4, 3)    (D) (-4, -3) |
| **(Q11 – Q15) Answer the following questions** |||
| Q.11 | The value of H.C.F. $\times$ L.C.M. for the number 183 and 30 is: |
| Q.12 | The areas of two similar triangles are $49\,cm^2$ and $64\,cm^2$ respectively. If the difference of the corresponding altitudes is 10 cm, then the lengths of altitudes -------- |
| Q.13 | Find the value of a, b and c, such that the numbers a, 10, b, c, 31 are in A.P. |
| Q.14 |  <br> In the figure                   given below, AB is a chord of the circle and AOC is its diameter such that $\angle ACB = 50°$ , if AT is the tangent to the circle at the point A, then $\angle BAT$ is equal to <br> (A) 65°   (B) 60 °   (C) 50°    (D) 40° <br> **OR** <br>  <br> In the figure                 QR is common tangent to given circle which meet |

**Target Mathematics by- Dr.Agyat Gupta**
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| | at T. tangent at T meets QR at P. if QP = 3.8 cm, the length of QR is  (A)7.6 cm   (B) 1.9 cm   (C) 11.4 cm   (D) 5.7 cm |
|---|---|
| Q.15 | Find the value of k for which the equation kx(x-2)+6=0 has equal roots. |

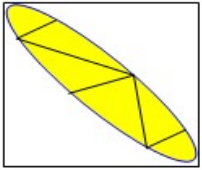## Fill in the blanks (Q16 – Q20)

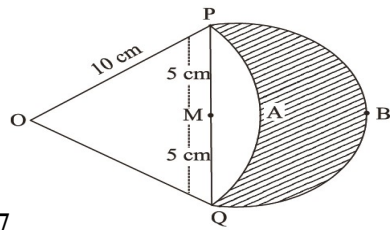| Q.16 | The length of the longest rod that can be placed inside a room with dimension $10\,m \times 10\,m \times 5\,m$ is: <br> (A)10m      (B)15m      (C)$5\sqrt{2}$ m      (D)20m |
|---|---|
| Q.17 | If the roots of the equation  are in $12\,x^2 + mx + 5 = 0$  the ratio 3:2, then m = ……. <br><br> **OR** <br><br> If $\alpha, \beta, \gamma$ are zeroes of polynomial $5x^3 - 4x^2 + 11x + 3$ then find the value of $\dfrac{1}{\alpha\beta} + \dfrac{1}{\alpha\gamma} + \dfrac{1}{\beta\gamma} = -----------.$ |
| Q.18 |  <br> Figure 2 <br> In figure 2, $\Delta ABC \sim \Delta PQR$  then  $y + z$ is <br> (a) $2+\sqrt{3}$    (b) $4+3\sqrt{3}$  (c) $4+\sqrt{3}$   (d) $3+4\sqrt{3}$ |
| Q.19 | The sum of first five positive integers divisible by 6 is: ------------- |
| Q.20 | A single letter is selected at random from the word "**PROPORTIONS**". The probability that the selected letter is a vowel is <br> (a) $\dfrac{2}{11}$ (b) $\dfrac{3}{11}$ (c) $\dfrac{4}{11}$ (d) 0 |

| | **PART – B**  (Question 21 to 26 carry 2  mark each.) |
|---|---|
| Q.21 | LCM of two numbers is 45 times their HCF. If one of the numbers is 125 and the sum of  HCF and LCM is 1150, find the other number. |
| Q.22 | Two tangent TP and TQ are drawn to a circle with center O, from an external point T. prove that $\angle PTQ = 2\angle OPQ$ . <br> **OR** <br> Prove that the segment joining the points of contact of two parallel tangents passes through the centre**.** |
| Q.23 | The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides. Prove it . <br> **OR** <br> If  two  sides  and  a  median  bisecting  third  side  of  a  triangle  are  respectively |

| | proportional to the corresponding sides and the median of another triangle, then prove that the two triangles are similar. |
|---|---|
| Q.24 | The angle of elevation of the top of a hill at the foot of a tower is 60 and the angle of elevation of the top of the tower from the foot of the hill is 30. If the tower is 50 m high, find the height of the hill. |
| Q.25 | Jayanti throws a pair of dice and records the product of the numbers appearing on the dice. Pihu throws 1 dice and records the squares the number that appears on it. Who has the better chance of getting the number 36? Justify? |
| Q.26 | An iron of length 1 m and diameter 4 cm is melted and cast into thin wires of length 20 cm each. If the number of such wires be 2000, find the radius of each thin wire. |

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

| Q.27 | Prove that $n^3 - n$ is divisible by 6. <div align="center">**OR**</div> An army contingent of 616 members is to march behind and army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march? |
|---|---|
| Q.28 | Find the sum of all two digit natural numbers which when divided by 3 yields 1 as remainder. |
| Q.29 | Solve graphically the system of equations: 2x – 3y = 5 & 3x + 4y +1 =0 . |
| Q.30 | If (x+a) is a factor of two polynomials $x^2 + px + q$ and $x^2 + mx + n$ , then prove that :  $a = \dfrac{n - q}{m - p}$ . |
| Q.31 | The base BC of an equilateral triangle ABC lies on y-axis. The coordinates of point C are $(0, -3)$. The origin is the mid-point of the base. Find the coordinates of the points A and B. Also find the coordinates of another point D such that BACD is a rhombus. |
| Q.32 | $if\ 2\cos\theta - \sin\theta = x$ & $\cos\theta - 3\sin\theta = y.$ prove that $2x^2 + y^2 - 2xy = 5$ <div align="center">0r</div> Prove that: $\dfrac{\sin A}{\sec A + \tan A - 1} + \dfrac{\cos A}{\cos ecA + \cot A - 1} = 1$ . |
| Q.33 | Find the area of the designed region in fig given below between the two quadrants of  radius 8cm each. ( Take $\pi = 3.14$ ) <div align="center">**OR**</div> |

In Fig. 7 , are shown two arcs PAQ and PBQ. Arc PAQ is a part of circle with centre O and radius OP while arc PBQ is a semi-circle drawn on PQ as diameter with centre M. If OP =PQ=10 cm show that area of shaded region is $25\left(\sqrt{3}-\dfrac{\pi}{6}\right)$ cm$^2$.

| Q.34 | Convert the following data to a less than type distribution and draw its Ogive. Also find median from the graph. |
|---|---|

| Class | 100-120 | 120-140 | 140-160 | 160-180 | 180-200 |
|---|---|---|---|---|---|
| Frequency | 12 | 14 | 8 | 6 | 10 |

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

| Q.35 | Construct a quadrilateral ABCD with AB = 5.5 cm, AD = 3.5 cm, BD = 4.4. cm, ∠B = 130º and BC = 4 cm. Construct a quadrilateral with its sides (4/7)th of the corresponding sides of ABCD. |
|---|---|

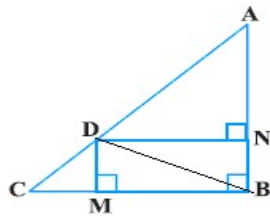| Q.36 | Solve : $\dfrac{a}{x-b}+\dfrac{b}{x-a}=2, x \neq b\ and x \neq a$ |
|---|---|

**OR**

The hypotenuse of a right angled triangle is 13m long. If the base of the triangle is 7m more than the other side, find the sides of the triangle.

| Q.37 | Through the mid-point M of the side CD of a parallelogram ABCD, the line BM is drawn intersecting AC in L and AD produced in E. Prove that EL = 2BL . |
|---|---|

**OR**



In given Fig. , D is a point on hypotenuse AC of Δ ABC,  such that BD⊥AC &DM ⊥ BC and DN⊥AB. Prove that :  ( i ) $DM^2 = DN \times MC$ (ii) $DN^2 = DM \times AN$

| Q.38 | A bucket is 40 cm in diameter at the top and 28 cm in diameter at the bottom. Find the capacity of the bucket in litters, if it is 21 cm deep. Also, find the cost of tin sheet used in making the bucket, if the cost of tin is Rs. 1.50 per sq dm. |
|---|---|

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| | |
|---|---|
| | **OR**<br>Water in a canal, 30 dm wide and 12 dm deep, is flowing with a speed of 10 km/hr. How much area will it irrigate in 30 minutes if 8 cm of standing water is required from irrigation. |
| **Q.39** | The angle of elevation of a cloud from a point 120 m above a lake is 30° and the angle of depression of its reflection in the lake is 60°. Find the height of the cloud. |
| **Q.40** | The mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50. Compute the missing frequency $f_1$ and $f_2$<br><br><table><tr><td>Class</td><td>0-20</td><td>20-40</td><td>40-60</td><td>60-80</td><td>80-100</td><td>100-120</td></tr><tr><td>Frequency</td><td>5</td><td>$f_1$</td><td>10</td><td>$f_2$</td><td>7</td><td>8</td></tr></table> |
| | **" THE TWO MOST POWERFUL WARRIORS ARE PATIENCE AND TIME "** |