

CODE:1901- AG-TS-3

REG.NO:-TMC -D/79/89/36/63

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.

Time : 3 Hours

Maximum Marks : 80

CLASS - X

MATHEMATICS

PRE-BOARD EXAMINATION 2019 -20

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

SECTION I : Single correct answer type

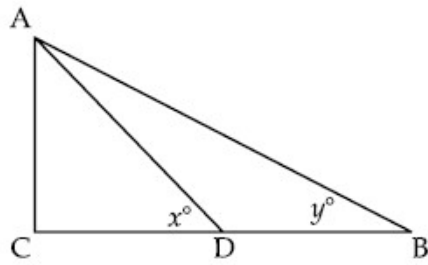
This section contain 10 multiple choice question . Each question has four choices (A) , (B) , (C) &(D) out of which **ONLY ONE** is correct .

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Q.1	The decimal representation of $\frac{93}{1500}$ will be (a) terminating (b) non-terminating (c) non-terminating, repeating (d) non-terminating, non-repeating
Q.2	Relation between mean, mode & median (a) Mode = 3Median – 2Mean (b) Mean = 3Median – 2Mode (c)Median = 3Mode – 2Mean (d) None of these
Q.3	H.C.F. of two numbers is 13 and their L.C.M. is 182 and one number is 26, then the other number is (a) 91 (b) 78 (c) 65 (d) 104
Q.4	The solution of the equations $\frac{a}{x} - \frac{b}{y} = 0$ and $\frac{ab^2}{x} + \frac{a^2b}{y} = a^2 + b^2$ is (a) $x = a, y = b$ (b) $x = -a, y = b$ (c) $x = a, y = -b$ (d) $x = -a, y = -b$
Q.5	“If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.” This theorem is known as (a) Pythagoras Theorem (b) Laplace Theorem (c) Thales Theorem (d) Area Theorem
Q.6	If $x = r \sin \theta \cos \phi, y = r \sin \theta \sin \phi$ and $z = r \cos \theta$, then (a) $x^2 + y^2 + z^2 = r^2$ (b) $x^2 + y^2 - z^2 = r^2$ (c) $x^2 - y^2 + z^2 = r^2$ (d) $z^2 + y^2 - x^2 = r^2$
Q.7	The ordinate of a point is twice its abscissa. Find the coordinates of the point if its distance from (4,3) is $\sqrt{10}$. (a) 1 , - 3 (b) - 1 , - 3 (c) 1 , 3 (d) none of these
Q.8	If the line segment joining the point (3, -4), and (1, 2) is trisected at points P(a, -2) and Q($\frac{5}{3}, b$) then,

- (A) $a = \frac{8}{3}, b = \frac{2}{3}$ (B) $a = \frac{7}{3}, b = 0$ (C) $a = \frac{1}{3}, b = 1$ (D) $a = \frac{2}{3}, b = \frac{1}{3}$

Q.9 In the adjoining figure, if D is mid point of BC, then the value of $\frac{\tan x^\circ}{\tan y^\circ}$ is :



- (a) 4 (b) 3 (c) 2 (d) 1

Q.10 If the point (x, y) is equidistant from the points (a+b, b-a) and (a-b, a+b), then:
 (A) $bx = ay$ (b) $ax = by$ (c) $ax + by = 0$ (d) none of these

(Q11 – Q15) Answer the following questions

Q.11 Write a rational number between $\sqrt{2}$ and $\sqrt{3}$.

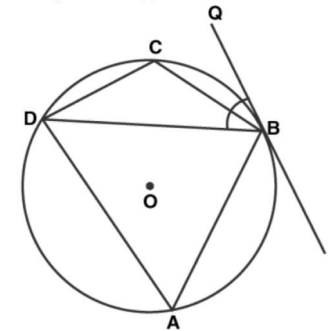
Q.12 P and Q are respectively the points on the sides AB and AC of a ΔABC . If $AP = 2$ cm, $PB = 6$ cm, $AQ = 3$ cm and $QC = 9$ cm, prove that $BC = 4PQ$.

Q.13

In the given figure, AB is the diameter of the circle. Find the value of $\angle ACD$
 (A) 25° (B) 45° (C) 60° (D) 30°

OR

ABCD is a cyclic quadrilateral PQ is a tangent at B. If $\angle DBQ = 65^\circ$, then



$\angle BCD$ is
 (A) 35° (B) 85° (C) 90° (D) 115°

Q.14 Find the 7th term from the end of the A.P 7, 10, 13 184

Q.15 Find the nature of the roots of the quadratic equation $13\sqrt{3}x^2 + 10x + \sqrt{3} = 0$

Fill in the blanks (Q16 – Q20)

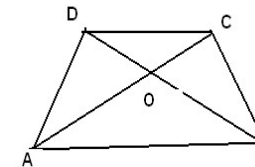
Q.16 The radius of a sphere is r cm. It is divided in to two equal parts. The whole surface of two parts will be -----

Q.17 The positive root of $\sqrt{3x^2 + 6} = 9$ is -----

or

What must be subtracted from the polynomial $f(x) = 12x^4 + 11x^3 - 23x^2 + 25x + 1$ so as to make it exactly divisible by $g(x) = 3x^2 + 5x - 2$ is -----

Q.18 In fig. $AB \parallel DC$. If $OA = 3x - 19$, $OB = x - 3$, $OC = x - 5$, $OD = 3$ then the



value of x. = -----

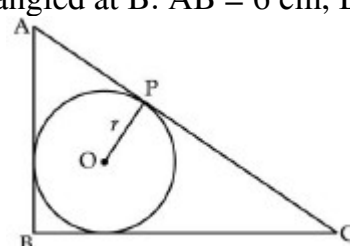
Q.19 37th term of the AP : $\sqrt{x}, 3\sqrt{x}, 5\sqrt{x}, \dots$ is -----

Q.20 In a throw of a die, what is the probability of getting a number less than 7 is ---

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

Q.21 Write the condition to be satisfied by q so that a rational number $\frac{p}{q}$ has a terminating decimal expansion.

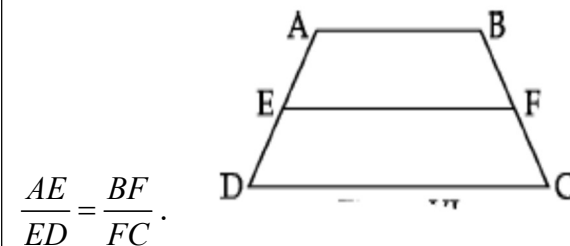
Q.22 In given figure, $\triangle ABC$ is right angled at B. $AB = 6$ cm, $BC = 8$ cm. find the radius r of the circle inscribed.



Q.23 O is any point inside a rectangle ABCD (shown in the figure). Prove that $OB^2 + OD^2 = OA^2 + OC^2$

or

If figure, ABCD is trapezium with $AB \parallel DC$; E and F are the points on non-parallel sides AD and BC respectively such that $EF \parallel AB$, prove that



Q.24 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.25 In a leap year, find the probability that there are 53 Tuesday in the year.
or
If odds in favour of an event be $2 : 3$. Find the probability of non – occurrence

of this event .
Q.26 A decorative block is made of two solids – a cube and a hemisphere. The Base of the block is the cube with edge of 7cm and the hemisphere attached on the top has a diameter of 4.9 cm. if the block is to be painted, find the total area to be painted.

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

Q.27 A circular field has a circumference of 360 km . Three runner start together and can cyclist 48 , 60 & 72 km per minute , round the field . When will they meet again .

or

What is the smallest number that, when divided by 35, 56 and 91 leaves remainders of 7 in each case?

Q.28 Find the maximum sum of the A.P: 120, 116, 112,

Q.29 If in a rectangle, the length is increased and the breadth is reduced by 2 units each, the area is reduced by 28 square units. If the length is reduced by 1 unit, and breadth increased by 2 units, the area increases by 33 square units. Find the dimensions of the rectangle.

or

Draw the graphs of the following equations : $2x - 3y + 6 = 0$, $2x + 3y - 18 = 0$ & $y - 2 = 0$.Find the vertices of the triangle so obtained. Also find the area of the triangle.

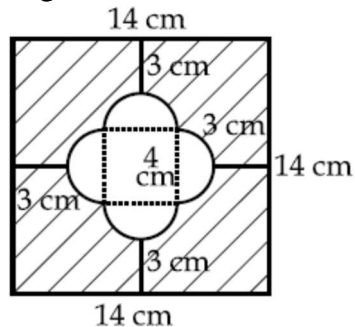
Q.30 If α and β are the zeros of the quadratic polynomial $p(x) = x^2 - 5x + 3$, then find a quadratic polynomial whose zeros are $2\alpha + 3\beta$ & $3\alpha + 2\beta$

Q.31 If two vertices of a parallelogram are (3,2) and (- 1,0) and the diagonals intersect at (2,-5) then find the other two vertices.

Q.32 Prove that :
 $\sin A(1 + \tan A) + \cos A(1 + \cot A) = \sec A + \cos ecA$.
Or

Prove that : $\frac{1}{\operatorname{cosec}A - \cot A} - \frac{1}{\sin A} = \frac{1}{\sin A} - \frac{1}{\operatorname{cosec}A + \cot A}$

Q.33 In Fig. 6, find the area of the shaded region [Use $\pi = 3.14$]



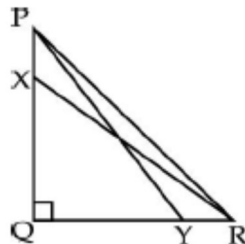
Q.34 The mean of the following frequency distribution is 62.8 and the sum of all frequency is 50. Complete the missing frequencies f_1 and f_2 :

CI	0-20	20-40	40-60	60-80	80-100	100-120	Total
F	5	f_1	10	f_2	7	8	50

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

Q.35 Construct a rhombus ABCD in which $AB = 4$ cm and $\angle ABC = 60^\circ$. Divide it into two triangles ABC and $\triangle ADC$. Construct the triangle $AB'C'$ similar to $\triangle ABC$ with scale factor $\frac{2}{3}$. Draw a line segment CD' parallel to CD , where D' lies on AD . Is $AB'C'D'$ a rhombus? Give reasons.

Q.36 In given fig a triangle PQR, right angled at Q, X & Y are points on the sides PQ & QR respectively such that $PX:XQ = 1:2$ & $QY:YR = 2:1$. Prove that



$9PY^2 + 9XR^2 = 13PR^2$.

OR

In an equilateral triangle ABC, the side BC is trisected at D. Prove that $9AD^2 = 7AB^2$.

Q.37 The sum of the ages of a father and his son is 50 years. Five years ago the product of their ages was 175. find their present ages.

or

Solve for x : $9x^2 - 9(a+b)x + [2a^2 + 5ab + 2b^2] = 0$.

Q.38 A toy is in the form of a cone mounted on a hemisphere of common base of diameter 7cm. if the height of the toy is 15.5 cm, find the total surface area of the toy (Take $\pi = \frac{22}{7}$)

OR

A well of diameter 2 m is dug 14 m deep. The earth taken out of its is spread evenly all around it to a width of 5 m to form an embankment. Find the height of the embankment.

Q.39 The angle of elevation of a jet fighter from point A on ground is 60° . After a flight of 10 seconds, the angle changes to 30° . If the jet is flying at a speed of 648 km/hour, find the constant height at which the jet is flying.

Q.40 Calculate median of the following distribution :

Marks	10 and above	20 and above	30 and above	40 and above	50 and above
No. of students	60	53	40	25	16

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शिक्षा की जड़ कड़वी है पर उसके फल मीठे हैं.