

CODE:0202- AG-TS-5

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

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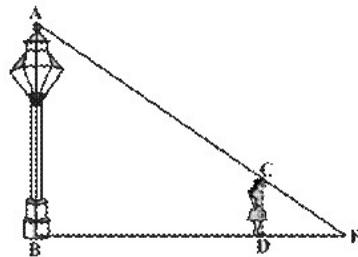
PART - A (Question 1 to 20 carry 1 mark each.)

SECTION I : Single correct answer type

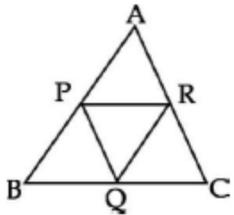
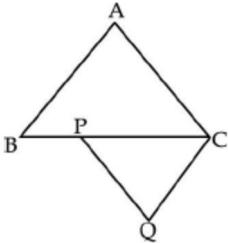
This section contain 10 multiple choice question . Each question has four choices (A) , (B) , (C) &(D) out of which **ONLY ONE** is correct .

Q.1	The prime factorization of denominator of the rational number expressed as $46.\overline{123}$ is : (A) $2^m \times 5^n$ where m and n are integers. (B) $2^m \times 5^n$ where m and n are positive integers. (C) $2^m \times 5^n$ where m and r rational integers. (D) Not of the form $2^m \times 5^n$ where m and n are non negative integers.
Q.2	The median of the scores 13,23,12,18,26,19,14,25,11 is (A) 14 (B) 18 (C) 19 (D) 23
Q.3	Two equilateral triangles have the sides of lengths 34 and 85 respectively. The greatest length of tape that can measure the sides of both of them exactly is (a) 34 (b) 17 (c) 51 (d) none of these
Q.4	For what value of p does the system of equation $2x - py = 0, 3x + 4y = 0$ has non zero solution? (A) $p = -6$ (B) $p = -\frac{8}{3}$ (C) $p = -\frac{2}{3}$ (D) $p = -\frac{4}{5}$
Q.5	If $\Delta ABC \sim \Delta QRP$, $\frac{ar(ABC)}{ar(PQR)} = \frac{9}{4}$, AB=18 cm and BC=15 cm; then PR is equal to (a) 10 cm (b) 12 cm (c) $\frac{20}{3}$ cm (d) 8 cm. .

Q.6	$\cos(40^\circ + \theta) - \sin(50^\circ - \theta) + \frac{\cos^2 40^\circ + \cos^2 50^\circ}{\sin^2 40^\circ + \sin^2 50^\circ} =$ (a) 1 (b) -1 (c) 2 (d) 0
Q.7	The distance between the points $(\cos\theta, \sin\theta)$ and $(\sin\theta - \cos\theta)$ is (A) $\sqrt{3}$ (B) $\sqrt{2}$ (C) 2 (D) 1
Q.8	The co-ordinates of the point which divides by the line segment joining the points (3, 5) and (7, 9) internally in the ratio 2 : 3 are (A) $(\frac{23}{5}, \frac{33}{5})$ (B) $(\frac{5}{23}, \frac{5}{33})$ (C) $(\frac{33}{5}, \frac{23}{5})$ (D) none of these
Q.9	The length of the string between a kite and a point on the ground is 85m. if the string makes angle θ with the level ground such that $\tan\theta = \frac{15}{8}$, how height is the kite? (a) 68m (b) 75m (c) 42m (d) 26m.
Q.10	If x is a positive integer such that the distance between the points P(x, 2) and Q(3, -6) is 10, units, then x = (A) 3 (B) -3 (C) 9 (D) -9
(Q11 – Q15) Answer the following questions	
Q.11	If the HCF of 55 and 99 is expressible in the form 55m - 99, then find the value of m
Q.12	A girl of height 120 cm is walking from the base of a lamp-post at a speed to 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.



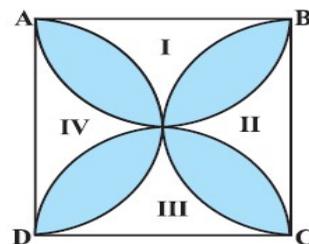
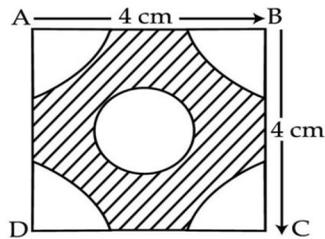
Q.13	If PA and PB are tangents to the circle with the center O such that $\angle APB = 50^\circ$, then $\angle OAB$ is equal to (A) 25° (B) 30° (C) 40° (D) 50° OR In given figure, O is the center of a circle of radius 6 cm. at a distance of 10 cm from O, a point P is taken. Two tangent PQ and PR are drawn to the circle from this point. Then area of quadrilateral PQOR is: (A) 60 cm^2 (B) 28 cm^2 (C) 48 cm^2 (D) 30 cm^2
Q.14	Find the term of the AP 9, 12, 15 ... Which are 39 more than its 36 th term?
Q.15	If -2 is a root of the quadratic equation $x^2 - px - 5 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots, find the value of k.
Fill in the blanks (Q16 – Q20)	
Q.16	The circumference of the edge of a hemispherical bowl is 132cm. when π is taken as $\frac{22}{7}$, the capacity of the bowl in cm^3 is (A) 2772 (B) 924 (C) 19404 (D) 9702
Q.17	If α, β are zeroes of $x^2 - 4x + 1 = 0$ then $\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta = \dots\dots\dots$ OR the zeroes of the polynomial $3\sqrt{3}x^2 + 7x - 2\sqrt{3}$. is -----
Q.18	In a $\triangle ABC$, D & E are points on the sides AB & AC respectively such that $DE \parallel BC$. If $AD = 4x - 3$, $AE = 1$, $BD = 3x + 4$ & $CE = 2$, then $x = \dots\dots\dots$
Q.19	37 th term of the AP : $\sqrt{x}, 3\sqrt{x}, 5\sqrt{x}, \dots$ is -----
Q.20	A box contains 6 nails and 10 nuts. Half of the nails and half of the nuts

	are rusted. If one item is chosen at random, what is the probability that it is rusted or is a nail (a) $\frac{3}{16}$ (b) $\frac{5}{16}$ (c) $\frac{11}{16}$ (d) $\frac{14}{16}$
PART – B (Question 21 to 26 carry 2 mark each.)	
Q.21	Find the greatest number which divides 285 and 1249 leaving remainders 9 and 7 respectively.
Q.22	The cost of fencing a circular field at the rate of Rs 24 per metre is Rs 5280. The field is to be ploughed at the rate of Rs 0.50 per m ² . Find the cost of ploughing the field (Use $\pi = \frac{22}{7}$).
Q.23	In figure, P, Q and R are respectively the mid – points of sides AB, BC and CA of ΔABC . Show that $ar(PBQR) = \frac{1}{2}ar(\Delta ABC)$
	 <p style="text-align: center;">OR</p> <p>In the given figure, $AB \parallel CQ$ and $AC \parallel PQ$. If $BP = \frac{1}{3}BC$, find the ratio of the areas of ΔABC and ΔQCP.</p> 
Q.24	The angles of elevation of the top of a tower from two points at a distance of 150 m and 100 m from the foot of tower and in the same line

	with it are complementary. Prove that height of tower is $50\sqrt{6}$ m.
Q.25	A box contains 20 balls bearing numbers, 1,2,3,4.....20. A ball is drawn at random from the box. What is the probability that the number of the ball is (i) an odd number (ii) divisible by 2 or 3 (iii) prime number
Q.26	How many balls, each of radius 1 cm, can be made from a solid sphere of lead of radius 8 cm ?
PART – C (Question 27 to 34 carry 3 mark each.)	
Q.27	Prove that $\sqrt{3}$ is an irrational number. OR Show that the square of any positive integer is of the form $4q$ or $4q + 1$ for some integers q.
Q.28	Find the two sum which is before and after middle term of the A.P. : 1, 8, 15, 505.
Q.29	Draw the graphs of the equations : $4x - y = 4$ & $4x + y = 12$ Deter mine the vertices of the triangle formed by the lines representing these equations and the x-axis. Shade the triangular region so formed.
Q.30	If the zeroes of the polynomials $x^3 - 27x^2 + 234x - 648$ are a + b, a, a - b, find the value of a and b.
Q.31	If the three vertices of a parallelogram A(6,1), B(8,2), C(9,4) . E is the mid point of CD . Find the area of triangle AED .
Q.32	Prove that: $\frac{\tan A}{1 - \cot A} + \frac{\cot A}{1 - \tan A} = 1 + \sec A \operatorname{cosec} A$. OR Prove that: $(\sin^8 \theta - \cos^8 \theta) = (\sin^2 \theta - \cos^2 \theta)(1 - 2\sin^2 \theta \cos^2 \theta)$.
Q.33	The mode of the following frequency distribution is 55 and total frequency is 51. Find the values of x and y

Class interval	0-15	15-30	30-45	45-60	60-75	75-90
Frequency	6	7	Y	15	10	X

Q.34 For each corner of a square of side 4 cm a quadrant of a circle of radius 1 cm is cut and also a circle of diameter 2 cm is cut as shown in fig. Find the area of the remaining portion of the square. (use $\pi = 3.14$)



OR

Find the area of the shaded design in Fig. 12.17, where ABCD is a square of side 10 cm and semicircles are drawn with each side of the square as diameter. (Use $\pi = 3.14$).

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 $\angle A = 90^\circ$. Draw another similar triangle whose sides are $\frac{4}{5}$ times of the sides of $\triangle ABC$. Justify your construction.

OR

Draw a circle of radius 2 cm with centre O and take a point P outside the circle such that OP = 6.5 cm. From P, draw two tangents to the circle.

Q.36 In a trapezium ABCD $AB \parallel DC$ and $DC = 2AB$. EF drawn parallel to AB cuts AD in F and BC in E such that $\frac{BE}{EC} = \frac{3}{4}$. Diagonal DB intersects EF

at G. Prove that $7FE = 10AB$.

Q.37 Solve the quadratic equation making a perfect square $42x^2 - 17x + 1 = 0$.

OR

A peacock is sitting on the top of a pillar, which is 9 m high. From a point 27 m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar. Seeing the snake the peacock pounces on it. If their speed are equal, at what distance from the hole is the snake caught?

Q.38 A toy is in the form of a cone mounted on a hemisphere of common base of diameter 7 cm. 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 it is spread evenly all around it to a width of 5 m to form an embankment. Find the height of the embankment.

Sol. Let n be the required height of the embankment.

Q.39 The angle of elevation of a jet plane from a point A on the ground is 60° . After a flight of 30 seconds the angle of elevation changes to 30° . If the jet plane is flying at a constant height of $3600\sqrt{3}$ m, find the speed of the jet plane.

Q.40 Find the mean for the following distribution by using short cut method :

x_i	15	20	22	24	25	30	33	38
Frequency	5	8	11	20	23	18	13	2

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सब जानते हैं समय कीमती है, फिर इसे दूसरों की बुराई में क्यों व्यर्थ गंवाना?