CODE:0902- AG-TS-6

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** 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.

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 .

Q.1 Rational number $\frac{p}{q}$, $q \neq 0$ will be terminating decimal if the prime factorization of q is of the form (m and n are non negative integers).

$2^m \times 3^n$ **(B)** $2^m \times 5^n$ **(C)** $3^m \times 5^n$ **(D)** $3^m \times 7^n$

Q.2 For the following distribution The modal class is :

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
No. of students	3	12	27	57	75	80

(A) 10 - 20 (B) 20 - 30 (C) 30 - 40 (D) 50 – 60

Q.3 If the least prime factor of a is 3, the least prime factor of b is 7, then the least prime factor of (a+b) is (a) 2 (b) 3 (c) 5 (d) 11

Q.4 Which is not a solution of $5x + 2y = 23$

(a) $x = 0, y = \frac{23}{2}$ (b) $x = 3, y = 4$ (c) $x = 4, y = \frac{3}{2}$ (d) $x = 5, y = 1$

Q.5 "If a line divides any two sides of a triangle in the same ratio, then the line parallel to the third side." This theorem is known as converse of

(a) Area Theorem (b) Basic proportionality Theorem

	(c) Pythagoras Theorem (d) Laplace Theorem
Q.6	If $\frac{1+\sin\theta}{1-\sin\theta}=\frac{36}{25}$, then the value of $\frac{1+\tan\theta}{1-\tan\theta}$ (A) $\frac{71}{49}$ (B) $\frac{7}{4}$ (C) $\frac{1}{49}$ (D) none of these
Q.7	The condition that the point (x, y) may lie on the lie joining (3, 4) and (-5, -6) is (A)5x + 4y + 1 = 0 (B) 5x – 4y + 1 = 0 (C) 5x – 4y – 1 = 0 (D) 5x + 4y – 1 = 0
Q.8	The third vertex of an equilateral triangle whose other two vertices are (1, 1) and (-1, -1) respectively is (A)$\left(\sqrt{3},-\sqrt{3}\right)$ (B) $\left(-\sqrt{3},\sqrt{3}\right)$ (C) both (A) and (B) (D) none of these
Q.9	A 1.8 m tall girl stands at a distance of 4.6 m from a lamp post and casts a shadow of 5.4m on the ground. Height of the lamp post is : (A) 1.53 m (B) $\frac{10}{3}m$ (C) 13.8 m (D) 0.8 m
Q.10	The co – ordinates of A, B, C are (6, 3), (-3, 5) and (4, -2) respectively and P is any point having co – ordinates (x, y) then any point having co – ordinates (x, y) then the point $\frac{area\ \ of\ \Delta PBC}{area\ \ of\ \Delta ABC}$ is (A) $\left\lvert\frac{x+y-1}{7}\right\rvert$ (B) $\left\lvert\frac{x+y-2}{7}\right\rvert$ (C) $\left\lvert\frac{x+y-3}{7}\right\rvert$ (D) $\left\lvert\frac{x+y-4}{7}\right\rvert$
Q.11	If the H.C.F. of 210 and 55 is expressible in the form $210\times5-55y$, then y =
Q.12	P and Q are points on sides AB and AC respectively of ΔABC. If AP = 3

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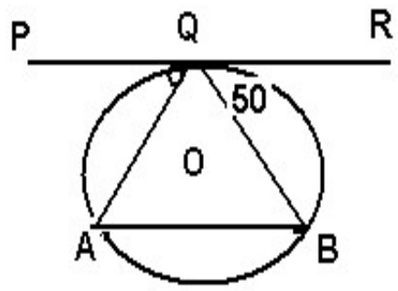
	cm, PB = 6cm, AQ = 5 cm and QC = 10cm, show that BC = 3PQ.
Q.13	The length of the tangent PA from a point P to a circle of a radius 3 CM is 4 cm. the distance of A from the center of the circle is: 5 cm (B) $\sqrt{7}$ cm (C) 25 cm (D) 7 cm **OR**  In given figure, if PQR is a tangent to a circle at Q whose center is O, AB is a chord parallel to PR and $\angle BQR = 50^\circ$ then $\angle AQB$ is equal to :- 80° (B) 40° (C) 20° (D) 50°
Q.14	If k+1, 3k and 4k+2 be any three consecutive terms of an A.P. find the value of k.
Q.15	If one zero of quadratic equation $3x^2=8x+2k+1$ is seven times the other, then find the zeroes and value of k.
Q.16	A solid sphere of radius r is melted and recast into the shape of a solid cone of height r. the radius of the base of a cone is: (A)2r (B)3r (C)r (D)4r
Q.17	If α,β are the roots of the equation $x^2+kx+12=0$ such that $\alpha-\beta=1$, the value of k = ……. **OR** Divide the polynomial $f(x)=x^4-2$ by the polynomial

	$g(x) = 5x - x^2 + 1$ and then the quotient is ----------
Q.18	If $\Delta PQR \sim \Delta XYZ$, $\angle Q = 50°$ and $\angle R = 70°$, then $\angle X + \angle Y =$…….
Q.19	The 10th term of the sequence $\sqrt{2}, \sqrt{8}, \sqrt{18}....$ is ---------
Q.20	Two customers Shyam and Ekta are visiting a particular shop in the same week (Tuesday to Saturday). Each is equally likely to visit the shop on any day and so on another day. Then the probability that both will visit the shop on consecutive days? (a) $\frac{5}{25}$ (b) $\frac{2}{5}$ (c) $\frac{1}{5}$ (d) none of these
	PART – B (Question 21 to 26 carry 2 mark each.)
Q.21	Prove that $\frac{1}{2+\sqrt{3}}$ is an irrational number.
Q.22	Prove that the tangents at the extremities of any chord make equal angles with the chord. **OR** A circle touches the BC of a $\triangle$ABC at P and touches AB and AC when produced at Q and R respectively as shown in figure, Show that $= \frac{1}{2}$ (Perimeter of $\triangle$ABC).
Q.23	If two scalene triangles are equiangular, Prove that the ratio of the corresponding sides is same as the ratio of the corresponding angle bisector segments. **OR** Prove that the area of the equilateral triangle described on the side of a square is half the area of the equilateral triangle described on this diagonals.
Q.24	The angles of elevation of the top of a tower from two points at a

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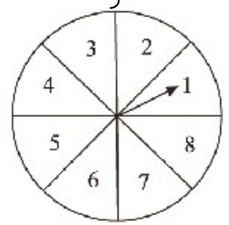
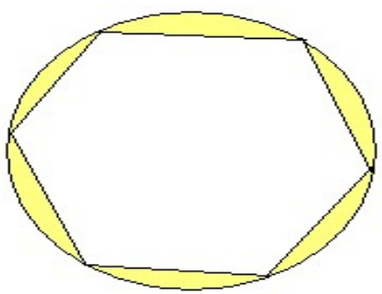
	distance of a and b (a > b) metres away from the base of the tower and in the same straight line with it are 30°and 60 °respectively. Find the height of the tower.
Q.25	A game of chance consists of spinning an arrow on a circular board, divided into 8 equal parts, which comes to rest pointing at one of the  Fig. 9 number 1,2,3…,8 (Fig. 9), which are equally likely outcomes. What is the probability that the arrow will point at (1) an odd number (2) a number greater than 3 (3) a number less than 9 .
Q.26	A rectangular sheet of paper of dimensions 44cm× 18cm is rolled along its length and a cylinder is formed. Find the volume of the cylinder so formed (use $\pi = \frac{22}{7}$)
	PART – C (Question 27 to 34 carry 3 mark each.)
Q.27	Find the largest number of 5 digits, which is divisible by 15, 25, 30 and 45. **OR** A diamond seller sells diamond of weight 10, 20, 25 and 60 grams only. He is allowed to use just one type of weight. What maximum value of weights should he use as to weight each one of them accurately.
Q.28	Find the sum of all three digits numbers which level the remainder 3, when divided by 5.
Q.29	Solve the following system of linear equations graphically : x - y = 1, 2x + y = 8. Shade the area bounded by these two lines and y-axis. Also,

	determine this area.
Q.30	On dividing the polynomial p(x)= $5x^4 - 4x^3 + 3x^2 - 2x + 1$ by another polynomial g(x)= $x^2 + 2$, if the quotient is $ax^2 + bx + c$ find a, b and c.
Q.31	Find the values of k so that the area of the triangle with vertices (1, −1), (−4, 2k) and (−k, −5) is 24 sq. units.
Q.32	If $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1$ and $\frac{x}{a}\sin\theta - \frac{y}{b}\cos\theta = 1$, prove that $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 2$. **OR** $\frac{2\sin 68^o}{\cos 22^o} - \frac{2\tan(90-15^o)}{5\cot 15^o} - \frac{3\tan 45^o \tan 20^o \tan 40^o \tan 50^o \tan 70^o}{5(\sin^2 70^o + \sin^2 20^o)}$
Q.33	A round table cover has six equal design as shown in fig.  if the radius or the cover is 28 cm, find the cost of making the design at the rate of Rs. 3.50 per cm ^{2} (use $\sqrt{3}$=1.7). **OR** Find the area of the segment AYB shown in Fig. 12.9, if radius of the circle is 21 cm and

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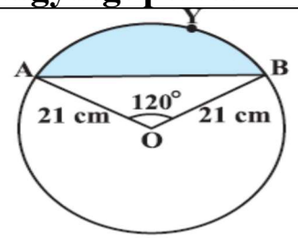
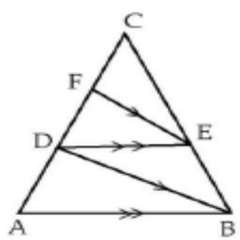
	 AOB = 120°. (Use $\pi = \frac{22}{7}$). Fig. 12.9
Q.34	The following table shows the marks obtained by 100 students of Class X in a school during a particular academic session. Find the mode of this distribution.

Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80
No. of students	7	21	34	46	66	77	92	10

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

Q.35	Draw a ΔABC in which BC = 6 cm, AB = 4 cm and AC = 5 cm. Draw a triangle similar ΔABC to with its sides equal to (3/4)th of the corresponding sides of ΔABC .
Q.36	In given figure AB||DE and BD||EF . Prove that $DC^2 = CF \times AC$.  .

	OR If a perpendicular is drawn from the vertex containing the right angle of a right triangle to the hypotenuse then prove that the triangle on each side of the perpendicular are similar to each other and to the original triangle. Also, prove that the square of the perpendicular is equal to the product of the lengths of the two parts of the hypotenuse.
Q.37	Solve the following equation for x : $(a+b)^2 x^2 + 8(a^2 - b^2)x + 16(a-b)^2 = 0, a+b \neq 0, a \neq b$ **OR** A motor boat whose speed is 18 km/hr in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the t\stream.
Q.38	An oil funnel of tin sheet consists of a cylindrical portion 10 cm long attached to a frustum of a cone. If the total height be 22cm, diameter of the cylindrical portion be 8cm and the diameter of the top of the funnel be 18cm, find the area of the tin required to make the funnel. **OR** A gulab jamun when completely ready for eating contains sugar syrup up to about 30%of its volume. Find how much syrup would be found in 45 gulab jamun shaped like a cylinder with two hemispherical ends, if the total length of each gulab jamun is 5cm and its diameter is 2.8 cm.
Q.39	A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.
Q.40	The median of the distribution given below is 14.4. Find the values of *x* and y, If the sum of frequency is 20. Class interval | 0-6 | 6-12 | 12-18 | 18-24 | 24-30 Frequency | 4 | x | 5 | y | 1

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सपने वो नहीं है जो हम नींद में देखते है, सपने वो है जो हमको नींद नहीं आने देते।