

CODE:1201- AG-TS-2

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 .

Q.1 The least number divisible by 2,3,7 and 9 is:
 A) 126 (B) 256 (C) 251 (D) 189

Q.2 The sum of lower limit of modal class and median class of the following data is :

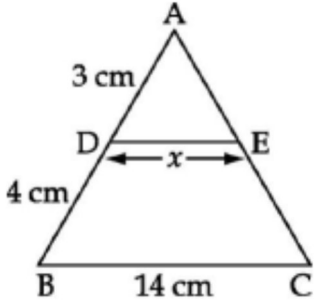
Classes	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	25	30	16	19	17	13

(A) 110 (B) 130 (C) 90 (D) 120

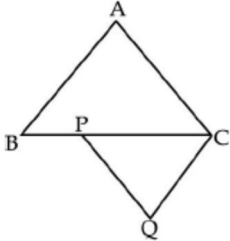
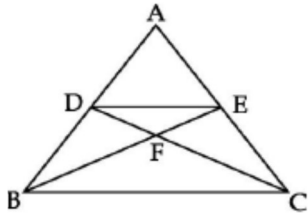
Q.3 The decimal expansion of $\frac{246}{2^7 \times 5^{-3}}$ terminates after
 (A) 7 place of decimal (B) 10 place of decimal
 (C) 6 place of decimal (D) can't be determined

Q.4 Which of the following pairs of equations represent inconsistent system?
 (a) $3x - 2y = 8, 2x + 3y = 1$ (b) $3x - y = -8, 3x - y = 24$
 (c) $lx - y = m, x + my = l$ (d) $5x - y = 10, 10x - 2y = 20$

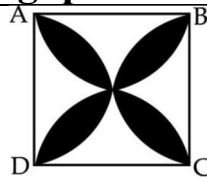
Q.5 If $a \cos \theta + b \sin \theta = m$ and $a \sin \theta - b \cos \theta = n$, then $a^2 + b^2 =$
 (a) $m^2 - n^2$ (b) $m^2 n^2$ (c) $n^2 - m^2$ (d) $m^2 + n^2$

Q.6	<div style="text-align: center;">  </div> <p>In figure below if $DE \parallel BC$ then x equals :</p> <p>(a) 6 cm (b) 7 cm (c) 3 cm (d) 4 cm</p>
Q.7	<p>If the centroid of a triangle is $(1, 4)$ and two of its vertices are $(4, -3)$ and $(-9, 7)$, then the area of the triangle is</p> <p>(A) 183 sq. units (B) $\frac{183}{2}$ sq. units (C) 366 sq. units (D) $\frac{183}{4}$ sq. units</p>
Q.8	<p>Determine the ratio in which the line $2x + y - 4 = 0$ divides the line segment the joining $A(2, -2)$ and $B(3, 7)$</p> <p>(A) 2 : 9 (B) 9 : 2 (C) 7 : 2 (D) 2 : 5</p>
Q.9	<p>If $x = 2 \sin^2 \theta, y = 2 \cos^2 \theta + 1$ then the value of $x + y$ is</p> <p>(a) 2 (b) 3 (c) $\frac{1}{2}$ (d) 1</p>
Q.10	<p>If points $(a, 0), (0, b)$ and $(1, 1)$ are collinear, then $\frac{1}{a} + \frac{1}{b} =$</p> <p>(a) -1 (B) 1 (C) 0 (D) 2</p>
Q.11	<p>The volume of a right circular cone having base radius 70cm and curved surface area 40040 cm^2 is -----</p>
Q.12	<p>The ratio of the sum and product of the roots of $7x^2 - 12x + 18 = 0$ is -----</p> <p style="text-align: center;">OR</p>

	<p>What must be added to $x^3 - 3x^2 - 12x + 19$ so that the result is exactly divisible by $x^2 + x - 6$ is -----</p>
Q.13	<p>A point D is on the side BC of an equilateral triangle ABC such that $DC = \frac{1}{4}BC$. If $(AD)^2 = k(CD)^2$ then $k =$ -----</p>
Q.14	<p>If the numbers a, b, c, d, e form an AP, then the value of $a - 4b + 6c - 4d + e =$ -----</p>
Q.15	<p>Cards marked with numbers 13, 14, 15 60 are placed in a box and mixed thoroughly. Once card is drawn at random from the box. Find the probability that the sum of digits on the card drawn is 5 is -----</p>
Q.16	<p>If two numbers do not have common factor (other than 1), then they are called -----</p>
Q.17	<p>In a ΔABC, D and E are points on the sides AB and AC respectively such that $DE \parallel BC$. If $AD = 4x - 3, AE = 8x - 7, BD = 3x - 1$ and $CE = 5x - 3$, find the value of x.</p>
Q.18	<p>The distance between the point of contact of two parallel tangents to given circle of radius 6 cm is (A) 6 cm (B) 12 cm (C) 9 cm (D) 18 cm</p> <p style="text-align: center;">OR</p> <p>If two tangent inclined at an angle of 90°, are drawn to a circle of radius 3 cm, the length of each tangent is -----</p>
Q.19	<p>Find the middle terms in the A.P. 20, 16, 12, ..., (-176).</p>
Q.20	<p>Find the roots of the quadratic equation $5x^2 - 6x - 2 = 0$ by using the quadratic formula.</p>
PART - B (Question 21 to 26 carry 2 mark each.)	
Q.21	<p>Is $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ a composite number? Justify your answer.</p>
Q.22	<p>Two circle with center O and Q of radii 3cm and 4cm respectively</p>

	intersect at two points P and Q such that OP and QP are tangents to the two circles. Find the length of the common chord PQ.
Q.23	<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 $\triangle ABC$ and $\triangle QCP$.</p>  <p style="text-align: center;">OR</p> <p>In figure below, $DE \parallel BC$ and $AD : DB = 5 : 4$. Find $\frac{ar(\triangle DFE)}{ar(\triangle CFB)}$</p> 
Q.24	A tree is broken by the wind. The top struck the ground at an angle of 30° and at a distance of 12 metres from the root. Find the height of the tree.
Q.25	<p>If the probability of winning a game is 0.3, what is the probability of losing it?</p> <p style="text-align: center;">OR</p> <p>A game consist of tossing a one rupee coin 3 times and nothing its out come each time. HANIF wins if all the tosses give the same result (three heads or three tails), and loses otherwise, calculate the probability that HANIF will lose the game.</p>
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	<p>Prove that $\sqrt{2}$ is an irrational number.</p> <p style="text-align: center;">OR</p> <p>Using Euclid Division Lemma to show that the cube of any positive integer is of the form $9m$ or $9m+1$ or $9m+8$.</p>
Q.28	A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows. Rs. 200 for the first day, Rs. 250 for the second day, Rs. 300 for the third day etc. the penalty for each succeeding day being Rs. 50 more than for the preceding day. How much money the contractor has to pay as penalty, if he has delayed the work for 30 days ?
Q.29	<p>While covering a distance of 30 km. Ajeet takes 2 hours more than Amit. If Ajeet doubles his speed, he would take 1 hour less than Amit. Find their speeds of walking.</p> <p style="text-align: center;">OR</p> <p>Solve : $\frac{1}{2(2x + 3y)} + \frac{12}{7(3x - 2y)} = \frac{1}{2}; \frac{7}{2x + 3y} + \frac{4}{3x - 2y} = 2$.</p>
Q.30	Obtain all the zeroes of $2x^4 - 9x^3 + 5x^2 + 3x - 1$ if two of its zeroes are $2 \pm \sqrt{3}$.
Q.31	If A (5, 2), B(2, -2) and C(-2, t) are the vertices of a right angled triangle with $\angle B = 90^\circ$, then find the value of t.
Q.32	<p>Prove that : $(\cos \theta + \sec \theta)^2 + (\sin \theta + \operatorname{cosec} \theta)^2 = 7 + \tan^2 \theta + \cot^2 \theta$.</p> <p style="text-align: center;">Or</p> <p>Evaluate: $\frac{2 \sin 68^\circ}{\cos 22^\circ} - \frac{2 \tan(90 - 15^\circ)}{5 \cot 15^\circ} - \frac{3 \tan 45^\circ \tan 20^\circ \tan 40^\circ \tan 50^\circ \tan 70^\circ}{5(\sin^2 70^\circ + \sin^2 20^\circ)}$</p>
Q.33	In given figure, find the area of the shaded region, where ABCD is a square of side 7 cm and semicircles are drawn with each side of the



square as diameter.(use $\pi = 22/7$)

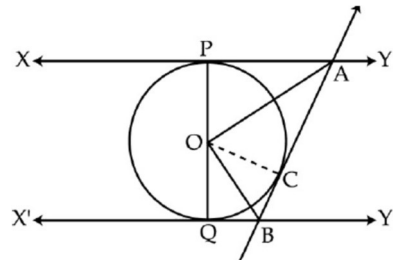
Q.34 Calculate the mean marks of the following data using the step deviation method

Marks	25-35	35-45	45-55	55-65	65-75
No. of students	6	10	8	12	4

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

Q.35 Construct a ΔABC in which $CA = 6$ cm, $AB = 5$ cm and $\angle BAC = 45^\circ$, then construct a triangle similar to the given triangle whose sides are $\frac{6}{5}$ of the corresponding sides of the ΔABC .

Q.36 In figure, XY and $X'Y'$ are two parallel tangents to a circle with center O and another tangent AB , with point of contact C intersect XY at A and $X'Y'$ at B . prove that $\angle AOB = 90^\circ$



OR

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 Out of the group of swans, $\frac{7}{2}$ times the square root of the total number are playing on the shore of the tank. The two remaining ones are playing in the water. Find the total number of swans.

or

Solve for x : $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}; a, b, x \neq 0$

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 liters, 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.

OR

Water flows at the rate of 10 m per minute through a cylindrical pipe having its diameter as 5 mm. How much time till it take to fill a conical vessel whose diameter of the base is 40 cm and depth 24 cm ?

Q.39 The angle of elevation of the top of a tower at a point on the level ground is 30° . After walking a distance of 100 m towards the foot of the tower along the horizontal line through the foot of the tower on the same level ground, the angle of elevation of the top of the tower is 60° . Find the height of the tower.

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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जो आपने सीखा है उसे भूल जाने के बाद जो रह जाता है वो शिक्षा है.