CODE:2001- AG-TS-3 REG.NO:-TMC -D/79/89/36/63

GENERAL INSTRUCTIONS :

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into four sections A,B,C and D. Section – A comprises of 6 question of 1 mark each. Section – B comprises of 6 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 8 questions of 4 marks each.
3. There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three questions of 4 mark each. You have to attempt only one of the alternatives in all such questions.
4. Use of calculator is not permitted.

PRE-BOARD EXAMINATION 2018 -19

MATHEMATICS **CLASS X**

Time : 3 to $3\frac{1}{4}$ Hours Maximum Marks : 80

SECTION A

Question numbers 1 to 6 carry 1 mark each

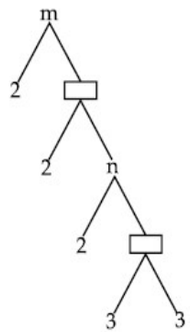
Q.1 The ordinate of a point is twice its abscissa. Find the coordinates of the point if its distance from (4,3) is $\sqrt{10}$.

Q.2 A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 and these are equally likely outcomes. Find the probability that the arrow will point at any factor of 8.

Q.3 If n^{th} term of 23,25,27,…… … Is same as the n^{th} term of (-17), (-10) ,(-3) ……., find n .

Q.4 If $\cos ec\,(A-B) = 2$ & $\cot(A+B) = \frac{1}{\sqrt{3}}, 0^o < (A+B) \le 90^o; A > B,$ then Find A & B.

Q.5 In the adjoining factor tree, find the numbers m, n



Q.6 In a trapezium PQRS with PQ || SR, the diagonals PR and QS intersect at X. If PQ = $\frac{2}{3}$ RS, find the ratio of areas of triangles PXQ and RXS.

OR

In $\triangle ABC, D$ and E are the point on the side AB and AC respectively such that $DE \| BC$. If $AD = 6x-7, DB = 4x-3, AE = 3x-3$ and $EC = 2x-1,$ then find the value of x.

SECTION B

Question numbers 7 to 12 carry 2 marks each

Q.7 A mobile phones shopkeeper has 48 mobile phones of which 40are good, 5 have only minor defect and 3 have major defect. He sells all the phones at same cost Paridhi will buy a phone is selected at random from the shop. What are the probabilities that it is (i) good phone (ii) major defect ? Which phone should not sell the

	shopkeeper at the same rate and why?
Q.8	Draw the graph of 2y = 4x - 6,2x = y + 3 and write the nature of the graph .
Q.9	The coordinates of the mid-point of the line joining the points (2p + 2, 3) and (4, 2q + 1) are (2p, 2q). Find the value of p and q Also prove that (p , q) lie on the line 5x – 2y – 11 = 0 .
Q.10	If x=3 is root of the equation $x^2 - x + k = 0$, find the value of p so that roots of the equation $x^2 + k(2x + k + 2) + p = 0$ are equal.
Q.11	If S_n denotes the sum of n terms of an AP whose common difference is d and 1st term is a. Find $S_n - 2S_{n-1} + S_{n-2}$.
Q.12	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. **OR** Show that the square of any positive integer is of the form $4q$ or $4q+1$ for some integers q.
	SECTION C **Question numbers 13 to 22 carry 3 marks each**
Q.13	ABC is a triangle in which AB = AC and D is a point on AC such that $BC^2 = AC \times CD$. Prove that BD = BC. **OR** In fig., we have AB || CD || EF. If AB = 6 cm, CD = x cm, EF = 10 cm, BD = 4 cm and DE = y cm, calculate the values of x and y.

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	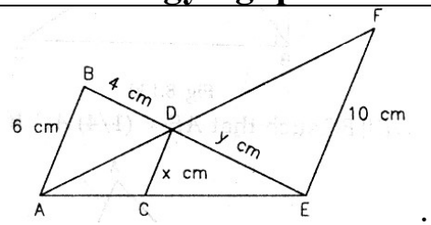
Q.14	Divide $2x^4 - 9x^3 + 5x^2 + 3x - 8$ by $x^2 - 4x + 1$ and verify the division algorithm.
Q.15	Coordinates of the vertices of ΔABC are A (– 4, –2), B (–3, 5) and C (K, –2). Find the positive integral value of K if area of triangle is 15 sq. units. **OR** If the three vertices of a parallelogram A(6,1), B(8,2), C(9,4) . E is the mid point of CD . Find the area of triangle AED .
Q.16	If the equation $(1+m^2)n^2x^2 + 2mncx + (c^2 - a^2) = 0$ has equal roots of x, prove that $c^2 = a^2(1+m^2)$. **OR** In a school, physical-education teacher wants to stand the student in the from of a square for their physical exercise. He found that 24 student are left, then he increases the size of the square by 1 student, he found that there are shortage of 25 students. Find the total number of students in the school. Why physical exercise is essential for the students. Which value will be reflected among students?
Q.17	The diameter of a roller 120 cm long is 84 cm. If it takes 500 complete revolutions to level a playground, determine the cost of levelling it at the rate of 30 paise per square meter.

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Q.18 Construct a ΔABC in which CA = 6 cm, AB = 5 cm and $\angle BAC = 45°$, then construct a triangle similar to the given triangle whose sides are $\frac{6}{5}$ of the corresponding sides of the ΔABC .

Q.19 A sweetseller has 420 kaju barfis and 130 badam barfis. She wants to stack them in such a way that each stack has the same number, and they take up the least area of the tray. What is the maximum number of barfis that can be placed in each stack for this purpose?

Q.20 Find the mean of the following data :

CI	25-30	30-35	35-40	40-45	45-50	50-55	55-60
f	14	22	16	6	5	3	4

Q.21 Simplify :

$$\frac{\cot(90°-\theta)\tan\theta - \cos ec(90°-\theta)\sec\theta}{\sin 12°\cos 15°\sec 78°\cos ec 75°} + \frac{\cos^2(50°+\theta)+\cos^2(40°-\theta)}{\tan 15°\tan 37°\tan 53°\tan 75°}$$

OR

Prove that $\frac{1+\cos A}{\sin A} + \frac{\sin A}{1+\cos A} = 2\cos ecA$.

Q.22 Compute the median from the following data .:

Mid Value :	115	125	135	145	155	165	175	185	195
Frequency :	6	25	48	72	116	60	38	22	3

SECTION D

Question numbers 23 to 30 carry 4 marks each

Q.23 With the vertices A, B and C of a triangle ABC as centres, arcs are drawn with radii 5 cm each as shown in Fig.

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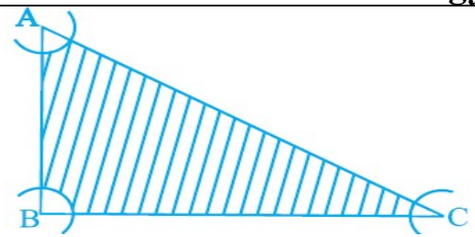

. If AB = 14 cm, BC = 48 cm and CA = 50 cm, then find the area of the shaded region. (Use π = 3.14).

Q.24 An open container made up of a metal sheet is in the form of a frustum of a cone of height 8 cm with radii of its lower and upper ends as 4 cm and 10 cm respectively. Find the cost of oil which can completely fill the container at the rate of Rs. 50 per liter. Also, find the cost of metal used, if it costs Rs. 5 per 100 cm^2. (Use π = 3.14)

OR

A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is $166\frac{5}{6}$ cm^3. Find the height of the toy. Also, find the cost of painting the hemispherical part of the toy at the rate of Rs. 10 per cm^2. [Use $\pi = 22/7$]

Q.25 If the pth term of an A.P. is $\frac{1}{q}$ and the qth term is $\frac{1}{p}$, show that the sum of pq terms is $\frac{(pq+1)}{2}$

Q.26 In a trapezium ABCD AB||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.

OR

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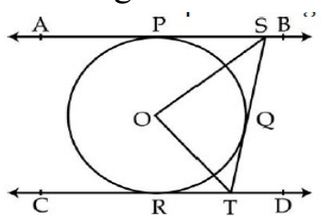
	State and prove "THALES THEOREM " .
Q.27	Prove That : $\frac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} = \frac{1+\sin\theta}{\cos\theta}$ ..
Q.28	A vertical tower stands on a horizontal plane and is surmounted by vertical flag staff of height 5 meters. At a point on the plane, the angle of elevation of the bottom and the top of the flag staff are respectively 30^0 and 60^0 find the height of tower.
Q.29	Solve for x & y : $\frac{1}{3x+y} + \frac{1}{3x-y} = \frac{3}{4}; \frac{1}{(3x+y)} - \frac{1}{(3x-y)} = \frac{-1}{4}$. **OR** A boat goes 12 km upstream and 40 km downstream in 8 hrs. It can go 16 km. upstream and 32 km downstream in the same time. Find the speed of the boat it still water and the speed of the stream.
Q.30	In figure, AB and CD are two parallel tangents to a circle with center O, ST is tangents segment between the two parallel tangents touching the circle at Q. Show that $\angle SOT = 90^\circ$ 
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	असफलता और सफलता दोनों ही अवस्थाओं में लोग तुम्हारी बातें करेंगे, सफल होने पर प्रेरणा के रूप में और असफल होने पर सीख के रूप में