MOCK TEST PAPER
2019-20 SESSION: LEVEL- STANDARD
CLASS-X
MATHEMATICS

Max. Marks: 80   **Duration: 3hrs**
General Instructions

(i)	All the questions are compulsory
(ii)	The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
(iii)	Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
(iv)	There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
(v)	Use of calculators is not permitted.

SECTION-A

Q 1-Q 10 are multiple choice questions. Select the most appropriate answer from the given options.

1. The ratio between the LCM and HCF of 5, 15, 20 is:
   (a) 9:1   (b) 4:3   (c) 11:1   (d) 12:1

2. In the formula $\acute{x} = a + h\left(\dfrac{\sum f_i u_i}{\sum f_i} \right)$ for finding the mean of a grouped frequency distribution u_i is:

   (a) $\dfrac{x_i + a}{h}$ (b) $h(x_i - A)$ (c) $\dfrac{x_i - a}{h}$ (d) $\dfrac{a - x_i}{h}$

3. For any natural number $n, 6^n - 5^n$ is always ends with:
   (a) 2   (b) 1   (c) 3   (d) 4

4. If $ax + by = a^2 - b^2$ and $bx + ay = 0$, then the value of $(x + y)$ is:
   (a) $a^2 - b^2$ (b) $a + b$ (c) $a - b$ (d) $a^2 + b^2$

5. $5\tan^2\theta - 5\sec^2\theta$ =
   (a) -5   (b) 5   (c) 0   (d) 1

6. If $\sin\theta + \cos\theta = 1$, then the value of $\sin\theta \cdot \cos\theta = ¿$
   (a) 1   (b) 0   (c) -1   (d) 2

7. The value of k, if the points A(2, 3), B(4, k) and C(6, -3) are collinear is:

(a) -2   (b) 2   (c) 0   (d) $\dfrac{-1}{2}$

8. The fourth vertex D of a parallelogram ABCD whose three vertices A(-2, 3), B (6, 7) and C (8, 3) is:
(a) (0, 1)   (b) (0, -1)   (c) (-1, 0)   (d) (1, 0)

9. $\sin\left(45°+\theta\right)-\cos\left(45°-\theta\right)$ is equal to

(a) $2\cos\theta$ (b) 0   (c) $2\sin\theta$ (d) tan θ

10. The distance of the point P(-6 ,8) from the origin is:

(a) 8   (b) $2\sqrt{7}$ (c) 10   (d) 6

(Q 11- Q 15) Fill in the blanks

11. If three spheres of radii 6 cm, 8 cm and 10 cm are melted and recast to form a cone of radius 12 cm. The height of the cone is_____.

12. The discriminant of the quadratic equation: $3\sqrt{3}x^2+10x-\sqrt{3}=0$ is

_____

Or

The roots of the quadratic equation $2x^2-\sqrt{5}x-2=0$ are_____ and_____

13. In triangle ABC,if DE||BC,DE=6 cm , BC=12 cm then find the ratio of area (ΔADE) and area (ECBD)= _____

14. Total number of three digit numbers which are divisible by 7 is _____

15. A card is drawn at random from a pack of 52 playing cards. The probability that the card is drawn is neither an ace nor a king is _____

(Q16-Q20) Answer the following

16. Why 17+11 $^\times$ 13 $^\times$ 17 $^\times$ 19 is a composite number? Explain.

17. The perimeters of two similar triangles are 12 cm and 18 cm respectively. If the area of the smaller triangles is 6 sq. cm, find area of the larger triangle.

18. In two concentric circles, prove that a chord of larger circle which is tangent to smaller circle is bisected at the point of contact.

Or

Two tangents making an angle of 120 $^\circ$ with each other are drawn to a circle of radius 6 cm. Find the length of each tangent.

19. The 15*th* term of an AP is 3 more than twice its 7*th* term. If the 10*th* term of the *AP* is 41, then find its n*th* term.

20. Find the value of p, for which one root of the quadratic equation $px^2-14x+8=0$ is 6 times the other.

SECTION-B

21. In an A.P., if $S_n=3n^2+5n \wedge a_k=164$. Find the value of k .

22. The perimeter of a sector of a circle of radius 5.2 cm is 16.4 cm. Find the area of the sector.

23. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of equilateral triangle describes on one of its diagonals.

Or

In a trapezium ABCD, O is the point of intersection of AC and BD, AB ||CD and AB=2CD. If the area of Δ AOB = 84 cm², find the area of Δ COD.

24. If *A* and *B* are acute angles such that $\tan A=\frac{1}{2}, \tan B=\frac{1}{3}$ and

$\tan(A+B)=\frac{\tan A+\tan B}{1-\tan A . tanB}$, find A+B.

25. A pair of dice is thrown once. Find the probability of (i) getting a total of 5 on two dice, (ii) getting a multiple of 2 on one dice and a multiple of 3 on the other.

Or

If 2 black kings and 2 red aces are removed from a deck of 52 cards, find the probability of getting (i) an ace of heart (ii) a king (iii) a red card

26. A cylinder, whose height is two-thirds of its diameter, has the same volume as a sphere of radius 4 cm, calculate the radius of the base of the cylinder.

SECTION-C

27. Given that $\sqrt{2}$ is irrational, Prove that $(5+3\sqrt{2})$ is an irrational number.

28. If the first term of an *A.P.* is 2 and the sum of first five terms is equal to one-fourth of the sum of the next five terms, find the sum of the first 30 terms.

29. Two places 'A' and 'B' are 120 km apart from each other on a highway. A car starts from 'A' and another from 'B' at the same time. If they move in the same direction, they meet in 6 hours and if they move in opposite direction, they meet in 1 hour and 12 minutes. Find the speed of each car.

Or

Solve for x and y : $\frac{5}{x+1}-\frac{2}{y-1}=\frac{1}{2}; \frac{10}{x+1}+\frac{2}{y-1}=\frac{5}{2}$.

30. Find the values of a and b so that $x^4+x^3+8x^2+ax+b$ is divisible by $ax+b$ is divisible by x^2+1.

31. Determine the ration in which the line 2x+y-4=0 divides the line segment joining the points A(2,-2) and B(3,7).

32. If $1+\sin^2\theta=3\sin\theta\cos\theta$, prove that $\tan\theta=1\vee\frac{1}{2}$

Or

If $\tan\theta+\sec\theta=l$, then prove that $\sec\theta=\frac{l^2+l}{2l}$

33. Sides of a triangular field are 15 m, 16 m and 17 m. With the three corners of the field a cow, a buffalo and a horse are tied separately with ropes of length 7 m each to graze in the field. Find the area of the field which cannot be grazed by the three animals.

34. The mean of the following data is 42. Find the missing frequencies x and y, if the total frequency is 100.

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	7	10	x	13	y	10	14	9

SECTION-D

35. Draw a triangle *ABC* with side BC=7 cm, ∠B= $45°$, ∠A=105 ° . Then construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of Δ ABC.

Or

Let ABC be a right triangle in which AB=3 cm, BC=4 cm and ∠B=90 ° . BD is the perpendicular from B on AC. The circle through B, C, D is drawn. Construct the tangents from A to this circle.

36. ABCD is a quadrilateral such that ∠D=90 ° . A circle C(O, r) touches the sides AB, BC, CD and DA at P, Q, R and S respectively. If BC=38 cm, CD=25 cm and BP=27 cm, find r.

37. A takes 10 days less than time taken by B to finish a piece of work. If both A and B together can finish the work in 12 days, find the time taken by B to finish work.

Or

Solve for $x:\frac{1}{2a+b+2x}=\frac{1}{2a}+\frac{1}{b}+\frac{1}{2x}$

38. A metallic right circular cone 20 cm high and whose vertical angle is 60 ° is cut into two parts at the middle of its height by a plane parallel to its base. If the frustum so obtained be drawn into a wire of diameter $\frac{1}{16}$ cm, find the length of the wire.

Or

If the diameter of the cross-section of a wire is decreased by 5%, how much per cent will the length be increased so that the volume remains the same?

39. Amit standing on a horizontal plane, finds a bird flying at a distance of 200 m from him at an elevation of 30°. Deepak standing on the roof of 50 meters high building, finds the angle of elevation of the same bird to be 45°. Both Amit and Deepak are on opposite sides of the bird. Find the distance of bird from Deepak.

40. 50 Students enter for a school javelin throw competition. The distance (in meters) thrown are recorded below.

Distance	0-20	20-40	40-60	60-80	80-100
No. of students	6	11	17	12	4

(i) Construct a cumulative frequency table
(ii) Draw a cumulative frequency curve (less than type) and calculate the median distance thrown by using the curve.
(iii) Calculate the median distance by using the formula for median.
(iv) Are the median distance calculated in (ii) and (iii) same?