MOCK TEST PAPER
2019-20 SESSION: 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. LCM of smallest two digit composite number and smallest composite number is
(a) 12   (b) 4   (c) 20   (d) 44

2. The median of the observations 29, 32, 48, 50, $x, x+2$, 72, 78, 84, 95 arranged in ascending order is 63. The value of x :
(a) 61   (b) 62   (c) 63   (d) 64

3. The decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after:
(a) One decimal place   (b) Two decimal places
(c) Three decimal places   (c) Four decimal places

4. The values of $x \wedge y \in \frac{4}{x} + 5y = \frac{7 \wedge 3}{x} + 4y = 5$ are

(a) $\frac{1}{2}, 1$ (b) $\frac{1}{3}, -1$ (c) $\frac{1}{3}, 2$ (d) $\frac{5}{2}, 3$

5. A, B and C are interior angles of ΔABC , then $cosec\left(\frac{A+B}{2}\right) = ¿$

(a) $\sin \frac{C}{2}$ (b) $\tan \frac{B}{2}$ (c) $\cos \frac{A}{2}$ (d) $\sec \frac{C}{2}$

6. In right angle ABC, right angled at B, if tan A =1, then 2 sin A. cos A=

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

7. If the distances of P(x, y) from A(5, 1) and B(-1, 5) are equal, then:

(a) $x-y$ (b) $3x=5y$ (c) $5x=2y$ (d) $3x=2y$

8. The ratio in which P(4, m) divides the line segment joining the points A(2, 3) and B(6, -3) is:

(a) 1:2   (b) 2:1   (c) 1:3   (d) 1:1

9. If sin A + sin^2 A = 1, then the value of the expression (cos^{2}A + cos^4 A) is

(a) 1   (b) $\dfrac{1}{2}$ (c) 2   (d) 3

10. If the vertices of a triangle are (1, k), (4, -3), (-9, 7) and its area is 15 sq. units, then the value of k is:

(a) -1   (b) 2   (c) -2   (d) -3

(Q11-Q15) Fill in the Blanks

11. If two identical cubes of side x are joined end to end, then the total surface area of the resulting solid is _____.

12. If -4 is a root of the quadratic equation $x^2+px-4=0$ and the quadratic equation $x^2+px+k=0$ has equal roots, then the value of k is _____.

Or

The roots of the quadratic equation $x^2+3x-m(m+3)=0$ where m is a constant are _____ and _____.

13. In the figure, PQ ||BC and AP:PB=1:2. $\dfrac{Area(\Delta APQ)}{AREA(\Delta ABC)}$ = _____.
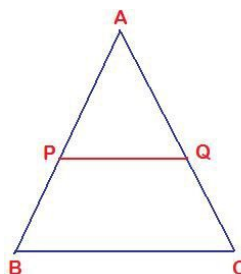
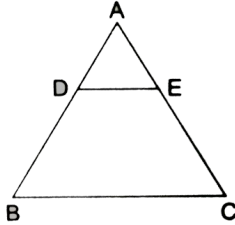**14.** If k, 2k-1 and 2k+1 are three consecutive terms of an AP, then value of k =_____.

15. Kings, queens and jacks are called _____cards.

(Q16-Q20) Answer the following

16.   State's Euclid's division lemma and Fundamental Theorem of Arithmetic. .

17.   In the figure, DE||BC and $\dfrac{AD}{DB}=\dfrac{3}{5}$. If AC = 4.8 cm, find the length of AE.

18.   If angle between two radii of a circle is 130°, then find the angle between the tangents at the end of the radii.

Or

Prove that the segments joining the points of contact of two parallel tangents passes through the centre.

19.   Find the middle term of the AP: 213, 205, 197,....., 37.

20.   Solve for $:\sqrt{3}x^2-2x-8\sqrt{3}=0$.

21.   Find the sum: 1+(-2) + (-5) **SECTION-B** + (-8) +...+(-236)

22.   The minute hand of a clock is $\sqrt{12}$ cm long. What is the area described by the minute hand between 8 am and 8:05 am?

23.   The perimeters of two similar triangles are 30 cm and 20 cm respectively. If one side of the first triangle is 12 cm, determine the corresponding side of the second triangle.

Or

In the figure, E is a point on side CB produced of an isosceles triangle ABC with AB=AC. If AD⊥BC and EF⊥AC, prove that Δ ABD Δ ECF.
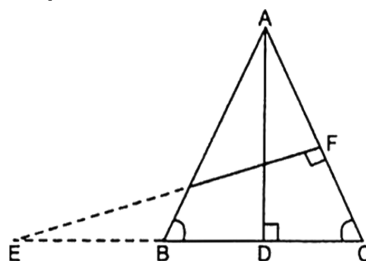
24.   Simplify: $\dfrac{\sin^3\theta+\cos^3\theta}{\sin\theta+\cos\theta}+(\sin\theta\,\cos\theta)$

25.   Savita and Hamida are friends. What is the probability that both will have :
(i) Different birthdays?

(ii) The same birthdays (Ignoring a leap year).

Or

A bag contains 5 red balls and some blue balls, if the probability of drawing a blue ball from the bag is four times that of red ball. Find the number of blue balls in the bag.

26. Water if flowing at the rate of 15 km per hour through a pipe of diameter 14 cm into rectangular tank which is 50 m long and 44 m wide. Find the time in which the level water in the tank will rise by 21 cm.

SECTION-C

27. Prove that $(3+2\sqrt{2})^2$ is irrational.

Or

Prove that one and only one out of n, n+2 and n+4 is divided by 3, where n is any positive integer.

28. How many terms of the A.P -6, $\dfrac{-11}{2}$,-5,... are needed to given the sum -25?

29. Solve: $99x+101y=499 ; 101x+99y=501$. Use method of Elimination.

Or

Find the value of a and b for which the following system of linear equations has infinite number of solutions. $2x-3y=7 ;(a+b)x-(a+b-3)y=4a+b$

30. If α and β are the zeroes of the quadratic polynomials $2x^2+5x+k$, find the value of k such that $(\alpha+\beta)^2-\alpha\beta=24$

31. Determine the coordinates of the centre of circle passing through the points A(8, 6), B(2, -2) and C(8, -2). Also, find the radius of the circle.

32. In an acute angled triangle ABC, If tan(A+B-C) =1 and sec (B+C-A)=2, find the values of A, B and C.
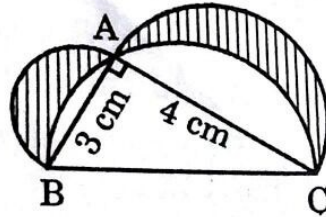
Or

Prove the following:

(i) $\sin^6\theta+\cos^6\theta+3\sin^2\theta.\cos^2\theta=1$

(ii) $\tan^4\theta+\tan^2\theta=sec^4\theta-sec^2\theta$

33. In the figure, ABC is a right-angle triangle, right-angled at A. AB=3 cm, AC=4 cm and semicircles are drawn on AB, AC and BC as diameters. Find the area of the shaded region.

34. The following distribution gives the daily income of 50 workers of a factory.

Daily income	400-420	420-440	440-460	460-480	480-500
No of workers	12	14	8	6	10

Convert this distribution to less than type of cumulative frequency distribution and draw its ogive.

35. Draw a triangle ABC with side BC=6.5 cm, ∠B=30° , ∠A=105° . Then construct another triangle whose sides are $\frac{3}{4}$ times the corresponding sides of the triangle ABC.

OR

Construct a pair of tangents to a circle of radius 3 cm which are inclined to each other at an angle of 60° .

SECTION-D

36. The ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.

37. Speed of a boat in still heater is 15 km/h. It goes 30 Km upstream and returns back at the same point in 4 hours 30 minutes. Find the speed of the stream.

Or

Sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the sides of the two squares.

38. A sector of a circle of radius 15 cm has the angle 120° . It is rolled up so that two bounding radii are joined together to form a cone. Find the volume of the cone. $\left(Taken\,\pi=\frac{22}{7}\right)$

Or

A hollow cone is cut by a plane parallel to the base and the upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ of the curved surface of the whole cone, find the ratio of the line segment into which the cones altitude is divided by the plane.

39. The angle of elevation of an airplane from a point on the ground is 600. After a flight of 30 seconds, the angle of elevation becomes 300. If the airplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of the airplane.

40. If the mode of the following data is 45, find x and y, given $\Sigma f_i = 50.$

Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	4	8	x	12	10	4	y