



ROLL NO.	
NAME	
CLASS & SECTION	

APEEJAY COMMON PRE-BOARD EXAMINATION, 2019-20

04

CLASS-X
MATHEMATICS

Time allowed : 3 hrs.

Maximum Marks : 80

General Instructions :

- All questions are compulsory.
- Section A has 20 questions of 1 mark each;
Section B has 6 questions of 2 marks each;
Section C has 8 questions of 3 marks each and
Section D has 6 questions of 4 marks each.
- Draw neat figures wherever required.
- The paper has certain internal choices in the questions.
You have to attempt any one of them.

SECTION-A

(20×1=20)

(QNO. 1 to 10 are MCQ's. Please write the correct option along with the answer in your answer sheet)

- The LCM of the two numbers is 1200. Which of the following cannot be their HCF?
(a) 200 (b) 500
(c) 400 (d) 700
- If n is any natural number, then $6^n - 5^n$ always ends with
(a) 1 (b) 3
(c) 5 (d) 7
- If one zero of the polynomial $f(x) = (k^2+4)x^2 + 13x + 4k$ is reciprocal of the other, then $k = ?$
(a) 2 (b) -2
(c) 1 (d) -1

P.T.O.

4. The value of k for which the system of equations $x + 2y = 5$, $3x + ky + 15 = 0$ has no solution is
- (a) 6 (b) -6
(c) $3/2$ (d) None of these
5. If $x = -1$ is a common root of $ax^2 + ax + 2 = 0$ and $x^2 + x + b = 0$ then, $ab = ?$
- (a) 1 (b) 2
(c) 4 (d) 3

OR

If the sum and the product of the roots of the equation $kx^2 + 6x + 4k = 0$ are equal, then $k = ?$

- (a) $-3/2$ (b) $3/2$
(c) $2/3$ (d) $-2/3$
6. The n th term of an A.P, then the sum of whose n terms is S_n , is
- (a) $S_n + S_{n-1}$ (b) $S_n - S_{n-1}$
(c) $S_n + S_{n+1}$ (d) $S_n - S_{n+1}$
7. If the points $(K, 2K)$, $(3K, 3K)$ and $(3, 1)$ are collinear, then K
- (a) $1/3$ (b) $-1/3$
(c) $2/3$ (d) $-2/3$
8. Sides of two similar triangles are in ratio 4:9. Area of these triangles are in the ratio
- (a) 2:3 (b) 4:9
(c) 81:16 (d) 16:81
9. The length of the hypotenuse of an isosceles right angled triangle whose one side is $4\sqrt{2}$ cm is
- (a) 12 cm (b) 8 cm
(c) $8\sqrt{2}$ cm (d) $12\sqrt{2}$ cm
10. If PT is tangent drawn from a point P to a circle touching it at T and O is the centre of the circle, then $\angle OPT + \angle POT = ?$
- (a) 30° (b) 60°
(c) 90° (d) 180°
- (QNO. 11 to 15 are fill in the blanks. Please write the correct answer in your answer sheet)
11. The smallest rational number by which $1/3$ should be multiplied so that its decimal expansion terminates after one place of decimal, is _____

12. The sides AB , BC , CA of $\triangle ABC$, touch a circle at P , Q and R respectively. If $PA=4\text{cm}$, $BP=3\text{cm}$ and $AC=11\text{cm}$, then length of BC is _____

OR

A circle touches the side DF of $\triangle EDF$ at H and touches ED and EF produced at K and M respectively. If $EK=9\text{ cm}$, then the perimeter of $\triangle EDF$ is _____

13. The value of $\sin^2 60^\circ + 2 \tan^2 45^\circ - \cos^2 30^\circ$ is _____
14. If $\sin \theta = 3/5$, then the value of $(\tan \theta + \sec \theta)^2$ is _____
15. The probability of guessing the correct answer to a test question is $\frac{x}{12}$. If the probability of not guessing the correct answer is $\frac{2}{3}$, then x is _____.

(QNO. 16 to 20 are short answer questions. Please write the correct answer in your answer sheet)

16. Find the area of the triangle formed by the lines $x=3$, $y=4$ and $x=y$.
17. If 1 is the zero of the polynomial $p(x) = ax^2 - 3(a-1)x - 1$, then find the value of a .
18. If the angles of elevation of the top of a tower from two points distant a and b from the base and in the same straight line with it are complementary, then find the height of the tower.
19. If the radius of a circle is diminished by 10%, then by how much percent is the area diminished?
20. What is the algebraic sum of deviations of a frequency distribution about its mean?

SECTION-B

(6×2=12)

21. Find the sum of first 25 terms of an A.P. whose n^{th} term is $1 - 4n$.
22. In what ratio does the line $x - y - 2 = 0$ divide the line segment joining $(3, -1)$ and $(8, 9)$?

OR

Find the value of k if the points $A(k+1, 2k)$, $B(3k, 2k+3)$ and $C(5k-1, 5k)$ are collinear?

23. If $5 \cot \theta = 3$, then find the value of $\frac{5 \sin \theta - 3 \cos \theta}{4 \sin \theta + 3 \cos \theta}$.
24. A sphere of radius 6 cm is dropped into a cylindrical vessel partly filled with water. The radius of the vessel is 8cm. If the sphere is submerged completely, then how much does the surface of water rise?

OR

2.2 cubic dm of metal is to be drawn into a cylindrical wire of diameter 0.50cm. Find the length of the wire obtained.

25. In a single throw of a pair of dice, what is the probability of getting a doublet?
 26. For what values of k will the following pair of equations have infinitely many solutions :

$$\begin{aligned} 2x + 3y &= 4 \\ (k + 2)x + 6y &= 3k + 2 \end{aligned}$$

SECTION-C

(8×3=24)

27. Using Euclid's division algorithm, find the HCF of 42, 56 and 385.

OR

Given that $\sqrt{5}$ is an irrational number, show that $3 + 2\sqrt{5}$ is irrational.

28. Draw the graph of the following pair of linear equations : $x + 3y = 6$, $2x - 3y = 12$. Hence find the area of the region enclosed between the $x = 0$, $y = 0$ and $2x - 3y = 12$.

OR

The area of a rectangle gets reduced by 9 sq units if the length is reduced by 5 units and its breadth is increased by 3 units. If we increase the length by 3 units and breadth by 2 units, the area is increased by 67 sq units. Find the length and breadth of the rectangle.

29. Find a point on y-axis which is equidistant from (6, 5) and (-4, 3).
 30. Prove that the sum of either pair of opposite angles of a cyclic quadrilateral is 180° .
 31. Prove that : $(1 + \cot \theta - \operatorname{cosec} \theta) (1 + \tan \theta + \sec \theta) = 2$

OR

Prove that : $\tan 7^\circ \tan 23^\circ \tan 60^\circ \tan 67^\circ \tan 83^\circ = \sqrt{3}$.

32. A cylindrical container of radius 6cm and height 15cm is filled with ice cream. The whole ice cream has to be distributed to 10 children in equal cones with hemispherical tops. If the height of the conical portion is 4 times the radius of its base, find the radius of the ice cream cone.
 33. Compute the mean for the following data :

Marks obtained Less than	10	20	30	40	50	60
Number of Students	14	22	37	58	67	75

34. Solve the following system of equations for x and y :

$$\begin{aligned} ax + by - a + b &= 0 \\ bx - ay - a - b &= 0 \end{aligned}$$

SECTION-D

(6×4=24)

35. The age of a man is twice the square of the age of the son. Eight years hence, the age of the man will be 4 years more than three times the age of his son. Find their present ages.

OR

Find the sum of all natural numbers lying between 100 and 500, which are divisible by 8.

36. State and prove the Basic Proportionality Theorem
37. From a solid cylinder whose height is 12 cm and diameter 10 cm, a conical cavity of same height and same diameter is hollowed out. Find the volume and the total surface area of the remaining solid.

OR

The inner diameter of a glass is 7 cm and it has a raised portion in the bottom in the shape of a hemisphere. If the height of the glass is 16 cm, find the apparent capacity and the actual capacity of the glass. (Take $\pi = 22/7$)

38. An aeroplane at an altitude of 200 meters observes the angles of depression of opposite points on the two banks of a river to be 45° and 60° . Find the width of the river.
39. $\triangle ABC$ is a right triangle right angled at C . If D is the midpoint of AB and $AC = \sqrt{3}BC$. Prove that $\angle ABC = 60^\circ$.

OR

Draw a $\triangle ABC$ with side $BC = 7\text{cm}$, $\angle B = 45^\circ$ and $\angle A = 105^\circ$.

Then construct a triangle similar to $\triangle ABC$ whose sides are $\frac{3}{4}$ times the corresponding sides of $\triangle ABC$.

40. The following distribution gives the daily income of 50 workers of a factory. Convert the data into less than type cumulative distribution and draw its ogive.

Daily income (Rs.)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	14	8	6	10

BEST OF LUCK!