CBSE QUESTION PAPER
CLASS-X
MATHS

SECTION - A

Question 1. Which of the following numbers has terminating decimal expansion?

$(a) \dfrac{37}{45}$

$(b) \dfrac{21}{2^3 5^6}$

$(c) \dfrac{17}{49}$

$(d) \dfrac{89}{2^2 3^2}$

Question 2:

If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kx + 1 \ is -3$, then the value of k is

$(a) \ -\dfrac{4}{3}$

$(b) \ \dfrac{4}{3}$

$(c) \ \dfrac{2}{3}$

$(d) \ -\dfrac{2}{3}$

Question 3:

If a rational number x is expressed as $x = \frac{p}{q}, where\ p, q\ are\ integer, q \neq 0$ and p, q have no common factor (except 1), then the decimal expansion of x is terminating if and only if q has a prime factorization of the form:

   (a) $2^m . 5^n$

   (b) $2^m 3^n$

   (c) $2^m . 7^n$

   (d) $5^m . 3^n$

   Where m and n are non-negative integers.

Question 4:

If $0° < x < 90°\ and\ 2\sin^2 x = \frac{1}{2}, then\ the\ value\ of\ x\ is$

$(a)\ 90°$

$(b)\ 30°$

$(c)\ 15°$

$(d)\ 60°$

Question 5:

$If\ \tan\theta = \frac{1}{\sqrt{7}},$ then the value of $\frac{cosec^2\theta - sec^2\theta}{cosec^2\theta + sec^2\theta}\ is$

$(a)\dfrac{1}{5}$

$(b)\dfrac{3}{4}$

$(c)\dfrac{6}{4}$

$(d)\dfrac{4}{\sqrt{7}}$

Question 6:

Which of the following numbers has non-terminating repeating decimal expansion?

$(a) \dfrac{7}{80}$

$(b) \dfrac{17}{320}$

$(c) \dfrac{20}{100}$

$(d) \dfrac{93}{420}$

Question 7:

The value of p for which the polynomial $x^3 + 4x^2 - px + 8$ is exactly divisible by $(x - 2)$ is

 (a) **1**
 (b) **0**
 (c) **15**
 (d) **16**

Question 8:

$n^2 - 1$ is divisible by 8, if n is

 (a) **an integer**
 (b) **a natural number**
 (c) **an odd integer**
 (d) **an even integer**

Question 9:

If $\cot \theta + \dfrac{1}{\cot \theta} = 2$, then the value of $\cot^2 \theta + \dfrac{1}{\cot^2 \theta}$ is

 (a) **−1**
 (b) **1**
 (c) **2**
 (d) **−2**

Question 10:

The value of $\csc^2 30° \sin^2 45° - \sec^2 60°$ *is*

        a. -1
        b. 1
        c. -2
        d. 2

SECTION - B

Question 11: Use Euclid's division algorithm to find HCF of 870 and 225.

Question 12: Explain $5 \times 4 \times 3 \times 2 \times 1 + 3$ is a composite number.

Question 13:

If α and β are the zeroes of the quadratic polynomial $p(x) = x^2 - ax + b$, then find the value of $\alpha^2 + \beta^2$.

Question 14: Solve $37x + 43y = 123, \;\; 43x + 37y = 117$

OR

Solve $x + \dfrac{6}{y} = 6, \;\; 3x - \dfrac{8}{y} = 5.$

Question 15: In figure, $\triangle ABD$ is a right triangle, right-angled at A and $AC \perp BD$. Prove that $AB^2 = BC. BD$

Question 16:

Without using trigonometric tables, find the value of

$$\frac{\cos 70°}{\sin 20°} + \cos 57° \csc 33° - 2 \cos 60°$$

OR

If A, B, C are interior angles of $\triangle ABC$, then show that

$$\cos\left(\frac{B+C}{2}\right) = \sin\frac{A}{2}$$

Question 17:
The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality.

Monthly Consumption (in units)	65-85	85-105	105-125	125-145	145-165	165-185	185-205
Number of consumers	4	5	13	20	14	8	4

Write the above distribution as less than type cumulative frequency distribution.

Question 18:

Find the mode of the following data:

Class	0-20	20-40	40-60	60-80
Frequency	15	6	18	10

SECTION-C

Question19:

Prove that $3 + \sqrt{2}$ is an irrational number

Prove that $5\sqrt{2}$ is irrational number.

Question20:

Show that 5^n can'tend with the digit 2 for any natural number n.

Question 21

A and B are friends and their ages differ by year. A's father D is twice as old as A and B is twice as old as his sister C. The age of D and C differ by 40 years. Find the ages of A and B.

OR

Solve the following pair of equations:

$$\frac{5}{x-1} + \frac{1}{y-2} = 2$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$

Question 22:

Obtain all zeroes of the polynomial $f(x) = x^4 - 3x^2 = x^2 + 9x$ if two of its zeroes are $-\sqrt{3}, and \ \sqrt{3}$.

Question 23:

In figure, $\triangle ABC$ is right-angled at B, BC=7cm and AC − AB = 1cm. Find the value of $\cos A - \sin A$.

Question 24:

$$\frac{\cos\theta}{\csc\theta + 1} + \frac{\cos\theta}{\csc\theta - 1} = 2\tan\theta$$

Question 25:

$$\sqrt{\frac{1 + \sin\theta}{1 - \sin\theta}} + \sqrt{\frac{1 - \sin\theta}{1 + \sin\theta}} = 2\sec\theta$$

Question 26:

In the figure, ABC is a triangle with $\angle B = 90°$, Medians AE and CD of respective lengths $\sqrt{40}\ cm\ and\ 5cm$ are drawn. Find the length of the hypotenuse AC.

Question 27: Compute the median for the following cumulative frequency distribution :

Weight	Less than 38	Less than 40	Less than 42	Less than 44	Less than 46	Less than 48	Less than 50	Less than 52
Number of students	0	3	5	9	14	28	32	35

<div align="center">OR</div>

Find the missing frequencies in the following frequency distribution table, if N = 100 and median is 32.

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-50	Total
No, of students	10	?	25	30	?	10	100

Question 28: The mean of- the following frequency distribution is 25.2. Find the missing frequency x

C.I.	0-10	10-20	20-30	30-40	40-50
Frequency	8	X	10	11	9

SECTION - D

Question29:

Divide $30x^4 + 11x^3 - 82x^2 - 12x + 48$ by $(3x^2 + 2x - 4)$) and verify the result by division algorithm.

Question 30:

If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, prove that the other two sides are divided in the same ratio. Solution. Given : A triangle ABC in which a line parallel to BC intersects other two sides AB and AC at D and E respectively.

<div align="center">OR</div>

Prove that in a triangle, if the square of one side is equal to the sum of the squares of the other two sides, then the angle opposite to the first side is a right angle. Solution. Given :A triangle ABC such that :

Question 31. Without using trigonometric tables, evaluate the following :

$$\frac{\sec 37°}{\csc 53°} + 2 \cot 15° \cot 25° \cot 45° \cot 75° \cot 65° - 3(\sin^2 18° + \sin^2 72°)$$

Prove that : $\dfrac{\tan\theta}{1-\cot\theta}+\dfrac{\cot\theta}{1-\tan\theta}=1+\sec\theta\,\mathrm{cosec}\theta$

Question 32.

Form the pair of linear equations in the following problem, and find their solutions graphically. 10 students of Class X took part in a Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

Question 33:

$prove\ that\ \sqrt{\dfrac{1+\sin A}{1-\sin A}}=\sec A+\tan A.$

Question 34:

m3.30. Solve the following system of linear equations graphically : &+y-8 32-2y-12 Also find the coordinates of the points where the lines meet the z-axis.