DELHI PUBLIC SCHOOL NOIDA
QUESTION BANK SA1
CLASS-X

MATHEMATICS
<u>MCQ</u>

Q1. If $\sin\theta = \dfrac{1}{3}$, then the value of $(2\cot^2\theta + 2)$ is

    (a) 15   **(b)** 18   **(c)** 16   **(d)** 20

Q2. If the following system has one solution
    4x + 6y = 11,
    2x + ky = 7
    then the value of k is

    (a) k=3   **(b)** k=-3   **(c)** $k \neq 3$ **(d)** $k \neq 8$

Q3. For a frequency distribution, mean, median and mode are connected by the relation,

    (a) mode = 3mean – 2median   **(b)** mode = 2median – 3mean

    (c) mode = 3median – 2mean   **(d)** mode = 3median + 2mean

Q4. If 1 is zero of $p(x) = ax^2 - 3(a-1)x - 1$ then the value of a is:

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

Q5. Lower limit of the modal class of the following distribution is:

classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	4	4	8	10	12	8	4

    (a) 50   **(b)** 30   **(c)** 40   **(d)** 20

Q6. If $\triangle ABC \sim \triangle DEF$, **BC = 3 cm**, **EF = 4 cm**, and ar $(\triangle ABC)$ = 9 cm^2
    then ar $(\triangle ABC)$ is:

    (a) 81   **(b)** 49   **(c)** 64   **(d)** 16

Q7. Which of the following numbers has terminating decimals.

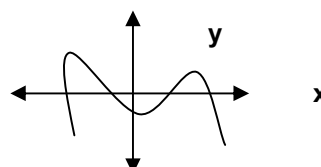   **(a)** $\dfrac{3}{7 \times 2}$ **(b)** $\dfrac{3}{5 \times 3}$ **(c)** $\dfrac{1}{3 \times 5}$ **(d)** $\dfrac{3}{11 \times 5}$

Q8. The graph of y = f(x) is shown, number of zeros of f(x) is:

    (a) 4   **(b)** 0   **(c)** 2   **(d)** 3

Q9. HCF of 210 and 55 is expressible in the form of $(210 \times 5 + 55y)$ then the value of y
    is:
    (a) 19   **(b)** -19   **(c)** 5   **(d)** -5

Q10. Product of the zeros of the polynomial $3x^2 + 2x + 7$ is:

(a) 7/3   (b) -7/3   (c) 2/3   (d) -2/3

NUMBER SYSTEM

Q1. Prove that $3 - \sqrt{5}$ is an irrational number.

Q2. Show that 4^n cannot end with digit 0 for any natural number.

Q3. Prove that $\sqrt{6}$ is an irrational number.

Q4. Find HCF of 65 and 117 and express in the form 65m + 117n.

Q5. Explain why the number 7 X 11 X 13 + 13 is composite.

POLYNOMIALS

Q1. Determine whether the given values are zeroes of the polynomial
$p(x) = px^2 + (4p^2 - 3q)x - 12pq$, x = 3q/p, x = 2q

Q2. Find the zeroes of the given polynomial and verify the relation between zeroes of the polynomial and its coefficients, $p(x) = 24x^2 - 65x + 21$

Q3. If 1 is the zero of the polynomial $p(a) = x^2a^2 - 3xa + 3x - 1$, find the value of x

Q4. Find a quadratic polynomial with sum of its zeroes as 0 and -10/3

Q5. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$ if it is known that two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.

Q6. Check whether $g(x) = x^2 - 3$ is a factor of $p(x) = 2x^4 + 3x^3 - 2x^2 - 9x - 12$ by applying division Algorithm

Q7. Find all zeroes of the of the polynomial $x^3 + 3x^2 - 4x - 12$ if one of its zeroes is -3.

Q8. Find the quotient and the remainder when $y^3 - 6y^2 + 9y + 7$ is divided by y – 1. Also verify the division algorithm.

Q9. Obtain all the zeroes of $3a^4 + 6a^3 - 2a^2 - 10a - 5$, if two of its zeroes are $\sqrt{5/3}$ and $-\sqrt{5/3}$

Q10. On dividing $x^3 - 3x^2 + x + 2$ by a polynomial g(x), the quotient and the remainder were x – 2 and -2x + 4 respectively. Find g(x)

LINEAR EQUATIONS

Q1. Draw the graph of the following equations on the same pair of axis
2x – y = 2
4x – y = 8
Also, find the coordinates of the points where the lines meet the x-axis.

Q2. The ratio of income of two persons is 9 : 7 and their expenditures is 4 : 3. If each of them manages to save rs. 2,000 per month, find their monthly incomes.

Q3. Solve : 2x/a + y/b = 2 , x/a – y/b = 4

Q4. Five years ago, Sagar was twice as old as Taru. Ten years later Sagar's age will be ten year

more than Taru's age. Find their present ages. What was the age of Sagar when Taru was Born?

Q5. Splve : $\dfrac{57}{x+y} + \dfrac{6}{x-y} = 5 , \dfrac{38}{x+y} + \dfrac{21}{x-y} = 9$

TROGONOMETRY

Q1. Prove the following identities:

(i) $\dfrac{\tan A}{1-\tan A} - \dfrac{\cot A}{1-\cot A} = \dfrac{\cos A + \sin A}{\cos A - \sin A}$

(ii) $\dfrac{1}{\csc A - \cot A} - \dfrac{1}{\sin A} = \dfrac{1}{\sin A} - \dfrac{1}{\csc A + \cot A}$

(iii) $\dfrac{\cos A}{1-\tan A} + \dfrac{\sin A}{1-\cot A} = \cos A = \sin A$

(iv) $\sin^6 A + \sin^6 A = 1 - 3\sin^2 A \cdot \cos^2 A$

Q2. If $\sin(A+B) = 1/2$ **and** $\cos(A+B) = 1/2$. **Find A & B**

Q3. If x/a cosA + y/b sinA = 1 **and** x/a sinA – y/b cosA = -1, **prove that:** $x^2/a^2 + y^2/b^2 = 1$

Q4. If secA + tanA = p, **Find the value of secA**

SIMILAR TRIANGLES

Q1. In a trapezium ABCD, O is the point of intersection of AC and BD, AB ∥ CD and AB = 2 CD. If the area of $\triangle$ **AOB = 84 cm^2, find the area of** $\triangle$ **COD.**

Q2. In $\triangle$ **ABC, AD** $\perp$ **BC, if BD/ DA = DA/DC, prove that ABC is right triangle**

Q3. In $\triangle$ **ABC altitude AD and CE intersects each other at point P. Show that** $\triangle$ **AEP** $\sim$ $\triangle$ **CDP.**

Q4. In a parallelogram ABCD, M is mid-point of side CD. The line BM is drawn intersecting AC at L and AD produced at E. Prove that EL = 2 BL.

Q5. Two triangles ABC and DBC are on same base BC and on the same side of BC in which $\angle$ **A =** $\angle$ **D = 90°. If CA and BD meet each other at E, show that AE . EC = BC . ED.**

STATISTICS

Q1. Using step deviation method find the mean of the following data:

Height(in cms)	No. of persons
150-160	4
160-170	9
170-180	18
180-190	28
190-200	24
200-210	10
210-220	5
220-230	2

Q2. Find the mode and median of the following data:

Marks	No. of students
Less than 100	3
Less than 200	10
Less than 300	23
Less than 400	55
Less than 500	70
Less than 600	75
Less than 700	80
Less than 800	100

**Q3. Using the following data, draw (a) less than ogive (b) more than ogive
And find the median from the graph.**

Height	No. of persons
45-50	8
50-55	10
55-60	9
60-65	15
65-70	10
70-75	8