MATHEMATICS SAMPLE PAPER - 1

TIME: 3/15 HRS. **MAX. MARKS :80**

GENERAL INSTRUCTIONS:

1. **All questions are compulsory.**
2.

Section	Number of Questions	Marks for each Question	Total Marks
Section (A)	1(i to xviii), 2 (i to vi) 3(i to xii) = 36	1	36
Section (B)	4 to 13 = 10	2	20
Section (C)	14 to 17 = 4	3	12
Section (D)	18 to 20 = 3	4	12

SECTION-A

1. (i) – (xviii) are multiple choice questions. Select the most appropriate answer from the given options.

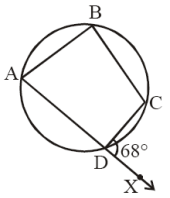
(i) Which of the following is not a prime factor of 3825?

(1) 3 (2) 5 (3) 11 (4) 17

(ii) If the mean and median of a set of numbers are 8.9 and 9 respectively, then the mode will be

(1) 7.2 (2) 8.2 (3) 9.2 (4) 10.2

(iii) In the given figure, ABCD is a cyclic quadrilateral then ∠ABC =



(1) 112° (2) 22° (3) 68° (4) None of these

(iv) The value of $\tan^2 60°$ is

(1) 3 (2) $\frac{1}{3}$ (3) 1 (4) ∞

(v) A card is drawn from a pack of 52 playing cards. The probability that it is a queen.

(1) $\frac{1}{52}$ (2) $\frac{1}{13}$ (3) $\frac{4}{13}$ (4) $\frac{1}{4}$

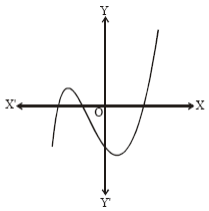
(vi) If $P(y) = 3y^4 - 5y^3 + y^2 + 8$, then p(–1) will be

(1) 2 (2) 15 (3) 17 (4) –17

(vii) In ΔABC, BC = AB, and ∠B = 80°, then ∠A equals:

(1) 80° (2) 40° (3) 50° (4) 100°

(viii) The number of zeroes for the given graph is_____.



(1) 3 (2) 2 (3) 4 (4) 1

(ix) If α, β are the zeroes of the polynomial $f(x) = x^2 + x + 1$, then $\frac{1}{\alpha} + \frac{1}{\beta} =$

(1) 1 (2) –1 (3) 0 (4) None of these

(x) If $\left(3,\frac{3}{4}\right)$ is the mid-point of the line segment joining the points (k, 0) and $\left(7,\frac{3}{2}\right)$, then the value of k is

(1) 1 (2) –1 (3) 0 (4) None of these

(xi) The line 2x + y – 4 = 0 divides the line segment joining A(2, –2) and B(3, 7) in the ratio

(1) 2 : 9 (2) 2 : 7 (3) 2 : 3 (4) 2 : 5

(xii) For the following frequency distributions:

Class	0–5	5–10	10–15	15–20	20–25
Frequency	8	10	19	25	8

The upper limit of the median class is:

(1) 15 (2) 10 (3) 20 (4) 25

(xiii) Two wires are 12 meters and 16 meters long. These wires are to be cut into pieces of equal length. Find the maximum length of each piece.

(1) 48 meter (2) 6 meter (3) 12 meter (4) 4 meter

(xiv) If P and Q are zeroes of polynomial $ax^2 + bx + c$ then find the value of P + Q:

(1) $\frac{b}{a}$ (2) $-\frac{b}{a}$ (3) $\frac{c}{a}-\frac{c}{a}$ (4) $-\frac{c}{a}$

(xv) The mode 6, 4, 3, 6, 4, 3, 4, 6, 5 and x may be:

(1) only 5 (2) 4 and 6 both (3) 3 and 6 both (4) 3, 4 and 6

(xvi) For what value of k, the product of zeroes of the polynomial $7kx^2 - 4x - 7k$ is 2?

(1) $-\frac{1}{14}$ (2) $-\frac{7}{2}$ (3) $\frac{7}{2}$ (4) $-\frac{2}{7}$

(xvii) If $\sin A = \frac{3}{5}$, then value of cot A is?

(1) $\frac{3}{4}$ (2) $\frac{4}{3}$ (3) $\frac{4}{5}$ (4) $\frac{5}{4}$

(xviii) Two dice are thrown together, the probability that they show different numbers is?

(1) $\frac{1}{6}$ (2) $\frac{5}{6}$ (3) $\frac{1}{3}$ (4) $\frac{2}{3}$

2. Fill in the blanks (i-vi)

(i) In an A.P. with first term a and common difference d, the nth term is a_n = ...

(ii) The sum or difference of a rational number and an irrational number is ..... number.

(iii) If the point C(–1, 2) divides internally the line segment joining A(2, 5) and B in the ratio 3 : 4, then the coordinates of B are ..... .

(iv) The value of k for which the system of equations kx – y = 2 ; 6x – 2y = 3 has no solution is .....

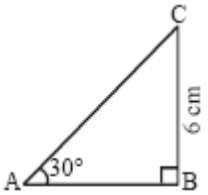
(v) The discriminant of quadratic equations $x^2 - 4x + 2 = 0$ is ..... .

(vi) $2\sin^2 30° - 3\cos^2 45° + \tan^2 60°$ is ..... .

3. Very Short answer type of questions (i-xii)

(i) Given HCF (306, 657) = 9. Find LCM (306, 657)

(ii) In the adjoining figure, ΔABC is right-angled at B and ∠A = 30°. If BC = 6 cm , find AC.



(iii) If $\cos A = \frac{9}{41}$, then find the value of tanA.

(iv) If the perimeter of a semicircular protractor is 36 cm, find the diameter.

(v) A coin is tossed once. What is the proabability of getting a head?

(vi) Find the 20th term of the AP 9, 13, 17, 21, ...

(vii) Find a quadratic polynomial with the given number as the sum and product of its zeroes respectively : $\frac{1}{4}, -1$

(viii) Find the a line intersects the y-axis and x-axis at the point P and Q, respectively. If (2, –5) is the midpoint of PQ, then the coordinates of P and Q.

(ix) In equation $5y - 3x - 10 = 0$ express y in the terms of x.

(x) If $3x = \text{cosec}\theta$ and $\frac{3}{x} = \cot\theta$, find the value of $3\left(x^2 - \frac{1}{x^2}\right)$.

(xi) Find the 26th term of A.P. 7, 4, 1, – 2.....

(xii) Find the angle of elevation of the sun. If length of shadow of a tower is equal to its height.

SECTION-B

4. From a point on the ground, which is 30cm away from the foot of the vertical tower, the angle of elevation of the top of the tower is found to be 60^0. Find the height of the tower.

5. Find the volume of the largest right circular cone that can be cut out of a cube of edge 42 cm.

6. Two men on either side of a 75m high building and in line with base of building observe the angle of elevation of the top of the building as 30° and 60°. Find the distance between the two men.

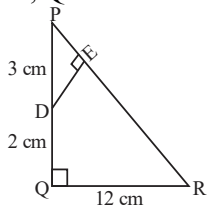
7. Find a quadratic polynomials whose sum and product of zeroes are 8 and 12 respectively.

8. Find sum of first 15 terms of an A.P. whose n^{th} term is given by $a_n = 25 - 2n$

9. The angle of elevation of the top of the tower from two points C and D at a distance of a and b from the base of the tower in the same straight line with it are complementary. Prove that the height of the tower is $\sqrt{ab}$

10. The circumference of a circle is 44 m. Find the area of circle.

11. In the given figure, $\triangle PQR$ is right angled triangle right angled at Q. $DE \perp PR$. Prove $\triangle PQR \sim \triangle PED$ and find the lengths of PE and DE if PD = 3 cm, QD = 2cm and QR = 12 cm.



12. A girl is twice as old as her sister. Four years hence, the product of their ages (in years) will be 160. Find their present ages.

13. P and Q are points on the sides AB and AC respectively of a triangle ABC. If AP = 2 cm, PB = 4 cm, AQ = 3 cm and QC = 6 cm, show that BC = 3PQ.

SECTION-C

14. The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight(in kg)	40–45	45–50	50–55	55–60	60–65	65–70	70–75
Number of students	2	3	8	6	6	3	2

OR

The first and the last terms of an A.P. are 17 and 350 respectively. If the common difference is 9, how many terms are there and what is their sum?

15. Solve the following system of linear equations graphically:

$x - y = 1$

$2x + y = 8$

Shade the area bounded by these two lines and y-axis. Also, determine this area.

OR

5 pencils and 7 pens together cost 50, whereas 7 pencils and 5 pens together cost 46. Find the cost of one pencil and that of one pen.

16. AB is a chord of length 24 cm of a circle of radius 13 cm. The tangents at A and B intersect at a point M. Find the length AM.

OR

How many multiples of 4 lie between 10 and 250 ?

17. Find the coordinates of the point which divides the join of (– 1, 7) and (4, – 3) in the ratio 2 : 3.

OR

Find the coordinates of the points of trisection of the line segment joining the points (4, – 1) and (– 2, –3).

SECTION-D

18. A card is drawn from a well shuffled pack of 52 cards. Find the probability of the following that card is :

(1) Black (2) Ace of heart (3) Spade (4) Queen of diamonds

OR

Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages (in Rs.)	500-520	520-540	540-560	560-580	580-600
Number of workers	12	14	8	6	10

Find the mean daily wages of the workers of the factory by using an appropriate method.

19. (i) Prove that $\cos^4\theta + \sin^4\theta = 1 - 2\cos^2\theta \sin^2\theta$

(ii) Prove that $= \tan^2 A \left(\frac{1+\tan^2 A}{1+\cot^2 A}\right) = \left(\frac{1-\tan A}{1-\cot A}\right)^2$ $[0 \le A < 45°]$

OR

Find the sum of first 10 terms of A.P. whose n^{th} term $a_n = 9 - 5n$.

20. The mean of the following frequency distribution is 62.8. Find the missing frequency x.

Class	0–20	20–40	40–60	60–80	80–100	100–120
Frequency	5	8	X	12	7	8

OR

The given distribution shows the number of runs scored by some top batsmen of the world in one- day international cricket matches.

Run Scored	**Number of Batsman**
3000-4000	4
4000-5000	18
5000-6000	9
6000-7000	7
7000-8000	6
8000-9000	3
9000-10000	1
10000-11000	1

Find the mode of the data.

...×××....