Pre-concept: Number line

Concept: Number theory

Sub-concept: Real number

Bloom's Level: analytical

Skill: critical thinking

Difficulty Level: Easy

Question type: True/False

1. **Each integer is a rational number.   True / False**.

Pre-concept: Graph plotting

Concept: Geometry

Sub-concept: Straight line

Bloom's Level: Understanding

Skill: Visual analysis

Difficulty Level: Easy

Question type: MCQ

2. **The origin of a graph paper can be obtained by the pair of equations**
   a. $x = 2, y = 1$ **b.** $x = 0, y = 1$ **c.** $x = 2, y = 0$ **d.** $x = 0, y = 0$

Pre-concept: Prime numbers

Concept: Number theory

Sub-concept: Real numbers

Bloom's Level: Analysing

Skill: Critical thinking

Difficulty Level: Moderate

Question type: True / false

3. **Two consecutive integers both are greater than 3, can be both prime numbers.**
            True / false

Pre-concept: Algebra

Concept: Trigonometry

1

Sub-concept: Range of ratios

Bloom's Level: Understanding

Skill: Critical thinking

Difficulty Level: Moderate

Question type: short answer type

4. **Find the maximum value of** $(\sin\theta + \cos\theta)^2$

Pre-concept: Algebraic calculation

Concept: Polynomials

Sub-concept: relation between zeroes

Bloom's Level: Memorizing

Skill: Critical thinking, calculation

Difficulty Level: Difficult

Question type: Long Answer type

5. **The sum of the zeroes of a quadratic polynomial be 4 and their product be** $\frac{7}{4}$ **. Find out the quadratic polynomial**.

Pre-concept: Diagram handling

Concept: Probability

Sub-concept: Classical probability

Bloom's Level: Creating

Skill: Critical thinking, visualization

Difficulty Level: Difficult

Question type: long answer type

6. **A class has 100 students. Among them 14 students have specialization in Mathematics only. 16 students have specialization in both Mathematics and history. 70 students have neither Maths nor History. Find the probability that if a student chosen randomly, he would have specialization in History only.**

Pre-concept: understanding of angle

Concept: trigonometry

Sub-concept: ratio values

Bloom's Level: memorizing

Skill: remembering

Difficulty Level: Easy

Question type: fill in the blank

7. **The value of θ for which $sin\,\theta$ and $cos\,\theta$ will be equal is**

Pre-concept: geometry

Concept: straight line

Sub-concept: intersection of two lines

Bloom's Level: application

Skill: Visual interpretation

Difficulty Level: Moderate

Question type: MCQ

8. **Consider three equations. $x = y,\;\; x = 0,\;\; y = 1$. The enclosed area by these lines will be**
   A) **Quadrilateral**   B) **Equilateral triangle**   C) **Point**   D) **Isosceles triangle**

Pre-concept: geometry

Concept: coordinate geometry

Sub-concept: distance between two points.

Bloom's Level: application

Skill: Critical thinking, Visual interpretation

Difficulty Level: Difficult

Question type: Short answer type

9. **A circle has its centre at $(3, 0)$ with radius 3 units. Find the distance between the points $(0, 0)$ and (3,3). (without the formula of distance between two lines)**

Pre-concept: arithmetic

Concept: arithmetic progression

Sub-concept: Sum of the progression

Bloom's Level: Identification

Skill: Calculation

Difficulty Level: Moderate

10. **An association starts with 5 persons. Each year two new persons become its member. At the end of the 17ᵗʰ year, how many members will be there in the association?**

Pre-concept: forming equation

Concept: quadratic equation

Sub-concept: zeroes of quadratic equation

Bloom's Level: evaluation

Skill: Critical thinking

Difficulty Level: Difficult

Question type: Long question type

11. **Anil bought a few candies. Rahim bought 4 candies more than Anil. David bought 3 candies less than Anil. Product of Rahim's and David's candy numbers is 18. Total how many candies they bought together?**

Pre-concept: mixed

Concept: mixed

Sub-concept: mixed

Bloom's Level: link

Skill: Critical thinking

Difficulty Level: Moderate

Question type : Match the following

12. **Match the table:**

$x^2 - 3 = 0$	0
$\sin \theta = 2$	True
$\tan \theta = 1$ $implies$ $\cos \theta =$?	Impossible
$3, 1, -1, -3, -5$ is an arithmetic progression.	Zeroes are irrational.
The sun is at the zenith. Then the length of the shadow of a lamppost will be	$\dfrac{1}{\sqrt{2}}$

Pre-concept: geometry

Concept: mensuration

Sub-concept: surface area

Bloom's Level: application, memorizing

Skill: Picture creation, critical thinking

Difficulty Level: Difficult

Question type : calculation based

13. **The height of a right circular cylinder be 5 unit. The circular base has its centre at $(2, 1)$ and its perimeter passes through the origin. Find the surface area of the cylinder.**

Pre-concept: geometry

Concept: coordinate geometry

Sub-concept: circle formula

Bloom's Level: application

Skill: calculation.

Difficulty Level: Difficult

Question type: calculation based

14. **The middle point of the straight line joining the two points $(2, 4)$ and $(6, -2)$ is the centre of a circle. Find the area of the circle.**

Pre-concept: algebra

Concept: pair of linear equation

Sub-concept: elimination method

Bloom's Level: analytical

Skill: Calculation

Difficulty Level: Moderate

Question type: short answer type

15. **Solve by elimination method:**
    $2x + y = 4$; $3x + 2y = 2$

Pre-concept : average

Concept: mean of data

Sub-concept: mean of ungrouped data

Bloom's Level: implimentation

Skill: Calculation

Difficulty Level: Easy

16. **There are 10 students in a class. Mean of their obtained marks is 40. Mean of the marks of first 5 students is 42. Mean of the marks of last 4 students is 37. how much marks did the 6th student score?**

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17. **A distribution is given in the following manner:**

Class	0-4	4-8	8-12	12-16	16-20
Frequency	2	2	9	5	3

   - **Find out the modal class.**
   - **Find out the upper and lower limits of the median class.**

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18. **A dice is thrown twice. What is the probability that the sum of the two results would be a multiple of 3?**

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19. **Statement 1: $\sqrt{3}$ be an irrational number.**

    Statement 2: $\pi = \frac{22}{7}$

    A) **Both the statements are true.**
    B) **Both the statements are false.**
    C) **Statement 1 is true but statement 2 is false.**
    D) **Statement 2 is true but statement 1 is false.**

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20. **In the following diagram, $\angle ABC = 60°$. Find $\angle CAB$.**

    AB **diameter. C is on the perimeter.**