VIGNAN HIGH SCHOOL

Evaluation Spectrum

Class : Class 9

Subject : IIT Foundation Maths

Chapters : 5 Trigonometry,6 Trigonometry Equations,7 Heights And Distances,8 Parallel Lines And Tranversal

Exam : IIT / NEET CUMULATIVE TEST - 2 (Foundation)

Subject Avg : 27

Overall Performance Analysis

Strengths:

1. **Trigonometric Identities:**
- Questions involving standard trigonometric identities, such as the first and second questions, where students were required to recall basic identities like $\cot\theta = 0$ and $\cos(90° + \theta)$, were handled quite well. These concepts are foundational in trigonometry, and students seemed comfortable solving them.
- **Example Questions:**
- *cot θ = 0, then the value of θ is (B) 90°*.
- *cos(90° + θ) = (A) sin θ*.

2. **Basic Angle Solutions:**
- When asked to find specific angle solutions, such as in questions like *sin x = cos x*, most students were able to solve them correctly.
- **Example Question:**
- *sin x = cos x (C) x = 45°*.

3. **Geometrical Concepts:**
- Questions involving geometric relations, like the one about the number of roots in a trigonometric equation or finding the angles based on tangent functions, were approached effectively.
- **Example Question:**
- *The number of roots of the equation $2\sin^2\theta + 3\sin\theta + 1 = 0$ in $(0, 2\pi)$ are (B) 2*.

4. **Straightforward Algebraic Solutions:**
- Students showed a strong grasp of simple algebraic manipulation within trigonometric contexts, as in the problem where the angle of elevation from a point 100 meters away from the base of a 100-meter-high

tower is asked. These are problems that rely heavily on basic trig functions.

- **Example Question:**

- *If a Tower is 100 meters high, then the angle of elevation of its top from a point 100 meters away from its foot is (C) 45°*.

Weaknesses:

1. **Complex Trigonometric Equations:**

- Some students faced difficulty in problems requiring more complex identities or algebraic manipulation, such as the equation involving $\tan\theta = 3$ and the solution for $1 - \cos^2\theta/2 - \sin^2\theta$.

- **Example Question:**

- *If $\tan\theta = 3$, then the value of $1 - \cos^2\theta/2 - \sin^2\theta$ is (A) 3/5*.

2. **Higher-Level Problem Solving:**

- Questions that involved higher-level trigonometric concepts, like the equation where $\sin(\alpha + \beta) = 1$ and $\cos(\alpha - \beta) = \frac{3}{2}$, proved to be challenging for many students.

- **Example Question:**

- *If $\sin(\alpha + \beta) = 1$ and $\cos(\alpha - \beta) = \frac{3}{2}$, \(\alpha = (B) 60°*.

3. **Conceptual Understanding of Parallel Lines and Angles:**

- There was some difficulty with understanding geometric concepts, particularly regarding parallel lines and interior angles. Questions about the angle between two parallel lines and whether statements about parallelism were true or false caused confusion.

- **Example Question:**

- *Statement I: The angle of depression to an object decreases as the object moves closer to the tower. Statement II: Tangent of an angle decreases as the angle increases. (D) Statement I is False, but Statement II is True*.

4. **Basic Geometry Application:**

- Geometry problems, such as the one involving alternate interior angles and the solution for x, posed challenges for some students.

- **Example Question:**

- *If $\angle P = (x + 40)^\circ$ and $\angle Q = (3x - 20)^\circ$ are alternate interior angles, then \(x = (D) 40°*.

Recommendations for Improvement:

1. **Strengthen Conceptual Understanding:**

- Students need to focus on building a deeper understanding of trigonometric identities and their application in more complex situations. This involves both memorization and comprehension of the

reasoning behind various formulas.

2. **Focus on Algebraic Manipulation:**
- More practice is needed on solving algebraic trigonometric equations. Problems that require rearranging terms and working with multiple identities should be practiced regularly.

3. **Reinforce Geometric Reasoning:**
- More attention should be given to understanding geometric relations, such as the behavior of angles in different configurations. Students should practice more on angle theorems, parallelism, and the properties of alternate interior angles.

4. **Timed Practice:**
- Given the variety of question types, practicing under timed conditions will help students improve both their speed and accuracy in solving complex problems.

5. **Additional Problem Solving:**
- Engage in solving higher-order problems where a combination of algebraic, geometric, and trigonometric concepts is required. Working through these will enhance problem-solving ability and preparedness for more difficult exams.