APPENDIX-II

ACHIEVEMENT TEST IN MATHEMATICS

SET THEORY AND TRIGONOMETRIC RATIOS FOR CLASS IX - FINAL DRAFT

1. Name of the Student _______ 2. School _______
3. Father's Name _______ 4. Class _______

DIRECTIONS:

This test is designed to assess your achievement on the two topics of Mathematics, namely, "Set Theory" and "Trigonometric Ratios". It consists of fifty items. Items are of multiple choice type, completion type, calculating type and short-answer type. Directions for attempting items have been provided at proper places. You are not to write any thing on the test booklet. You are to write answers on the answer sheet provided to you. There is no time limit, but still try to finish it as quickly as possible.

The students are expected to choose any one from the given four answers and write only in the booklet given.

1. If n(A) = p, then the no. of all the subsets of A will be
   (A) p (B) p^2 (C) 2^p (D) 2p

2. If S = (1, 2, 3, 4), the no. of subsets with atleast three elements is
   (A) 8 (B) 4 (C) 5 (D) 15

3. If A = (1, 2, 3, 4, 5, 6), B = (1, 3, 6, 7, 9), C = (2, 4, 6, 8, 10)
   then n(AnBnC) =
   (A) 0 (B) 1 (C) 3 (D) 10

4. In a class of 30 students, 12 take physics only and 8 take chemistry only. How many take both the subjects?
   (A) 10 (B) 4 (C) 12 (D) 18

5. Cos (90 - θ) is equal to
   (A) -Sinθ (B) Sinθ (C) Cos θ (D) None of the above
   (Contd...)
Appendix-II (Contd.)

6. $1 - \cos^2 60$ is equal to
   (A) $\cos^2 30$ (B) $\sin^2 60$ (C) $\sin^2 60$ (D) None of the above.

7. $\sin^6 \theta + \cos^4 \theta$ is the same as (A) $\sin^2 \theta^2 + \cos^2 \theta^2$
   (B) $\sin^4 \theta + \cos^4 \theta$
   (C) $\sin^2 \theta + \cos^2 \theta$
   (D) None of the above.

8. $\cos^2 \theta + \sin^2 3\theta$ is equal to (A) $\cos^2 \theta + \sin^2 4\theta$
   (B) $\cos^2 (6\theta + 6)$
   (C) $2\sin^2 3\theta$
   (D) None of the above

In the following statements (9 to 17) write 'T' against each true and 'F' against each false statement at the end of each statement.

9. $A \cup \emptyset = \emptyset$ ( )
10. $(A \cup B)' = A' \cup B'$ ( )
11. $(A \cap B)' = A' \cap B'$ ( )
12. $(A')' = A$ ( )
13. The sets \(0\) and \(\emptyset\) are the same set. ( )
14. The sets \(\emptyset\) and \(\emptyset\) are the same sets. ( )
15. The sets \(a\) and \((a, a, a)\) are equal. ( )
16. $\sin 60 + \sin 30 = \sin 90$ ( )
17. $\cos^2 \theta + \cos^2 (90 - \theta)$ is constant for all values of \(\theta\) ( )

Fill up the blanks (18-25) with appropriate answers given in the bracket.

18. $A - \emptyset = A$ (U, \mathcal{P}) (Contd....)
Appendix-II (Contd.)

19. \((A - B)' = A' \cup B'\)

20. \((p) - (p, q, r)\)

21. \(p - (p, q, r)\)

22. \((p, q, r) - (q)\)

23. In a right angled triangle ABC, the hypotenuse AB = 1, BC = x, and AC = y
   then \(\cos \angle ABC = \frac{1}{x^2+y^2}\)

24. If \(\cos^2 \theta = \frac{1}{2}\) and \(\theta\) is an acute angle than the value of \(\theta\) is \(\frac{\pi}{4}\) or \(45^0\).

25. \(\cos(90 - \theta) \sin \theta + \sin(90 - \theta) \cos \theta = \frac{1}{2}\).

26. Write all the subsets of the set \((a, b)\).

27. If \(A = (1, 3, 7, 9), B = (0, 2, 4, 6, 8)\), find \(A \cup B\).

28. Given \(A = (2, 3, 8)\) and \(B = (0, 5)\), find \(A \cap B\).

29. Given \(f(x) = x^2 + 2x + 1\), then find \(f(6) + f(1)\).

30, and 31. If a set \(A\) contains 11 elements and a set \(B\) contains 5 elements such that \(BCA\). How many elements are there in each of the following :
   \(A \cup B = \text{______} \quad A \cap B = \text{______}\)

32. For any set \(A\) are the sets \(A \cap A\) and \(A \cup A\) the same.

State which of the following (from 33 to 38) collections are sets and which are not.

33. A collection of short boys in your class.

34. A collection of books written by Rabinder Nath. (Contd...)
Appendix-II (Contd.)

35. A collection of Maths. books in your school library.
36. A collection of all long rivers in India.
37. A collection of good books in Maths. in your school library.
38. A collection of all even natural nos.

Rewrite the following (39 to 40) sets in the set form.

39. A is the set of all odd integers between 50 to 80.
40. S is the set of all the vowels in the word 'arrangement'.
41. Find the value of \(8\sin 30\sin 60\sin 90\).
42. Write an angle for which \(\sin A = \cos A\).

Let \(A = \{1,2,(3,4),5\}\), state which of the following (43 to 50) are true, which are false.

43. \((3,4) \subset A\)
44. \((3,4) \in A\)
45. \((3,4) \notin A\)
46. \(1 \in A\)
47. \(1 \notin A\)
48. \((1,2,5) \subset A\)
49. \((1,2,5) \in A\)
50. \((1,2,3) \subset A\)

(Contd....)
### Appendix-II (Contd.)

**KEY:**

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<thead>
<tr>
<th>Questions</th>
<th>Answers</th>
<th>Questions</th>
<th>Answers</th>
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<tbody>
<tr>
<td>1.</td>
<td>C</td>
<td>26.</td>
<td>(a), (b), (a, b)</td>
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<tr>
<td>2.</td>
<td>A</td>
<td>27.</td>
<td>(1, 3, 7, 9, 0, 2, 4, 6, 8)</td>
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<td>3.</td>
<td>A</td>
<td>28.</td>
<td>{(2, 0), (2, 5), (30), (3, 5), (8, 0), (8, 5)}</td>
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<td>4.</td>
<td>A</td>
<td>29.</td>
<td>53</td>
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<td>5.</td>
<td>B</td>
<td>30.</td>
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<td>6.</td>
<td>B</td>
<td>31.</td>
<td>3</td>
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<td>7.</td>
<td>D</td>
<td>32.</td>
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</tr>
<tr>
<td>8.</td>
<td>C</td>
<td>33.</td>
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<td>9.</td>
<td>F</td>
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<td>10.</td>
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<td>35.</td>
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<td>F</td>
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<td>12.</td>
<td>F</td>
<td>37.</td>
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<tr>
<td>13.</td>
<td>F</td>
<td>38.</td>
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<td>16.</td>
<td>F</td>
<td>40.</td>
<td>(a, e)</td>
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<td>17.</td>
<td>T</td>
<td>41.</td>
<td>(\frac{2}{3})</td>
</tr>
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<td>18.</td>
<td>U</td>
<td>42.</td>
<td>45°</td>
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<td>19.</td>
<td>(\cap)</td>
<td>43.</td>
<td>F</td>
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<td>20.</td>
<td>C</td>
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<td>22.</td>
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<td>48.</td>
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<td>25.</td>
<td>1</td>
<td>49.</td>
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<td>50.</td>
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