

MATHEMATICS CLASS TEST ON TRIGONOMETRY**TIME: 2 HRs****MM: 70**

This paper contains 13 Subjective type questions. Each question has marks mentioned beside each question. Partial marking of proper steps will be awarded in case of relevant answers.

1. Find the value of $\log_5 \log_2 \log_3 \log_2 512$. **[4 Marks]**

2. Find the simplified value of $\log \left(\frac{16 \times (256)^{1/3}}{6 \div (448)^{1/4}} \right)$. **[4 Marks]**

3. If $\log_3 y = x$ and $\log_2 z = x$ then express 72^x in terms of y and z . **[4 Marks]**

4. If $\log_{2\sqrt{2}} 512 = a$ then find the value of $\log_a 216$. **[4 Marks]**

5. Find the value of $\log_{0.008} \sqrt{5}$. **[4 Marks]**

6. Find the value of $(\log_3 4)(\log_4 5)(\log_5 6)(\log_6 7)(\log_7 8)(\log_8 9)$. **[6 Marks]**

7. Solve: $\log_2 x + \log_4 x + \log_{16} x = \frac{21}{4}$. **[6 Marks]**

8. If $\frac{\log_e x}{b-c} = \frac{\log_e y}{c-a} = \frac{\log_e z}{a-b}$, show that: **[6 Marks]**

(i) $xyz = 1$

(ii) $x^a y^b z^c = 1$

(iii) $x^{b+c} y^{c+a} z^{a+b} = 1$

9. If $x = \log_{2a} a$, $y = \log_{3a} 2a$, $z = \log_{4a} 3a$, show that $xyz + 1 = 2yz$.

[6 Marks]

10. If $a^3 + b^3 = ab(8 - 3a - 3b)$, show that $\log \frac{a+b}{2} = \frac{1}{3}(\log a + \log b)$.

[6 Marks]

11. If $\log_a bc = x$, $\log_b ca = y$, $\log_c ab = z$, prove that $\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1} = 1$.

[6 Marks]

12. Evaluate the following logarithms without using log table:

[8 Marks]

(i) $\log_{2\sqrt{2}} (32 \times \sqrt[5]{4})$

(ii) $\log_{a^{-1/2}} \left(\sqrt[3]{a^{-15}} \right)$, $a \neq 1$

(iii) $\log_{2\sqrt{3}} 1728$

(iv) $\log_{ab} \left[\sqrt{a \cdot \sqrt[3]{b}} \times \sqrt{b \cdot \sqrt[3]{a}} \right]$, $ab \neq 1$

13. Find the number of solutions of $\log_4 (x-1) = \log_2 (x-3)$.

[6 Marks]