

Class – XI

APPLIED MATHEMATICS

HOME ASSIGNMENT

TOPICS - BINARY NUMBERS, INDICES, LOGARITHM, AVERAGE

Date : 27/04/2024

1. Convert the following decimal numbers to binary numbers:

(i) 129 (ii) 75.125 (iii) 217.8125 (iv) 53

2. Convert the following binary numbers to decimal numbers:

(i) 11001 (ii) 11010101.11 (iii) 100111.101 (iv) 1101100

3. If $x = 36$, then find the value of $x^{\frac{11}{16}} \left[x \left\{ x \left(x^{\frac{1}{2}} \right)^{\frac{1}{2}} \right\}^{\frac{1}{2}} \right]^{\frac{1}{2}}$.

4. If $x = (28)^{\frac{1}{3}}$ and $y = (27)^{\frac{1}{3}}$, find the value of $x + y - \frac{1}{x^2 + xy + y}$.

5. Show that $\frac{\left(a + \frac{1}{b}\right)^m \times \left(a - \frac{1}{b}\right)^n}{\left(b + \frac{1}{a}\right)^m \times \left(b - \frac{1}{a}\right)^n} = \left(\frac{a}{b}\right)^{m+n}$

6. If $\sqrt{5^n} = 125$, then find the value of $5^{(64)^{\frac{1}{n}}}$.

7. If $\frac{2^{m+n}}{2^{n-m}} = 16$, $\frac{3^p}{3^n} = 81$ and $a = 2^{\frac{1}{10}}$, then find the value of $\frac{a^{2m+n-p}}{(a^{m-2n+2p})^{-1}}$

8. Given that $\log 2 = 0.3010$ and $\log 3 = 0.4771$, then find the value of each of the following:

(i) $\log 108$ (ii) $\log \left(\frac{3}{8}\right)$ (iii) $\log 5^{\frac{1}{3}}$

9. Solve the following equations :

(i) $\log (x+1) + \log (x-1) = 3\log 2 + \log 3, x > 0$

(ii) $\frac{\log 16 + 2 \log 2}{\log 4} = x$

10. If $a^{2x-3}b^{2x} = a^{6-x}b^{5x}$, prove that $3 \log a = x \log \left(\frac{a}{b}\right)$.

11. Prove that : (i) $\frac{\log_a n}{\log_{ab} n} = 1 + \log_a b$ (ii) $\frac{\log_a x \cdot \log_b x}{\log_a x + \log_b x} = \log_{ab} x$

12. Find the value of $\log_{\sqrt{2}} \sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}}$.

13. The average of 5 consecutive odd numbers is 95. What is the fourth number in the descending order?

14. If p, q, r are three numbers such that $pq + qr + rp = 0$ and the average of p, q, r is a . Then prove that the average of p^2, q^2, r^2 is $3a^2$.

15. The average weight of 3 persons P, Q and R is 84 kgs. Another person X joins the group and the average now becomes 80 kgs. If another person Y, whose weight is 3 kgs more than that of X replaces P, then the average weight of Q, R, X and Y becomes 79 kgs. What is the weight of P ?