

SELF ASSESSMENT TEST -2**CLASS 10+1****SETS AND FUNCTIONS**

1. Define set and representation of a set.
2. Prove that (a) $(A \cup B)^c = A^c \cap B^c$ (b) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.
3. Prove that $A - (B \cap C) = (A - B) \cup (A - C)$.
4. Prove that $P(A \cap B) = P(A) \cap P(B)$
5. In a survey of 100 students, the number of students studying the various languages were found as English only 18; Eng but not hindi 23; Eng & Sanskrit 8; Eng 26; Sanskrit 48; Sanskrit & Hindi; no language 24. Find (a) How many stu were studying Hindi ? (b) How many stu were studying Eng & Hindi ?
6. Find the domain & range of the following functions (a) $f(x) = \frac{x-2}{3-x}$
 (b) $f(x) = \frac{x}{1+x^2}$ (c) $f(x) = \frac{1}{\sqrt{x-5}}$ (d) $f(x) = \sqrt{16-x^2}$ (e) $f(x) = \frac{x^2-9}{x-3}$
 (e) $f(x) = \frac{4-x}{x-4}$ (f) $f(x) = \frac{1}{2-\sin 4x}$ (g) $f(x) = \frac{|x-1|}{x-1}$ (h) $f(x) = \sqrt{\log\left(\frac{5x-x^2}{6}\right)}$
7. Find the domain of the following functions (a) $f(x) = \frac{1}{\sqrt{x-|x|}}$
 (b) $f(x) = \frac{1}{\sqrt{x+|x|}}$ (c) $f(x) = \frac{1}{\log_{10}(1-x)} + \sqrt{x+2}$
8. Find the range of the following functions (a) $f(x) = |x-3|$
 (b) $f(x) = 1 - |x-2|$

9. Let A, B, & C be the sets s.t. $A \cup B = A \cup C$ and $A \cap B = A \cap C$. Show that $B = C$.

10. For any two sets A & B, prove that $P(A) = P(B) \Rightarrow A = B$.

11. Let A, B & C be three sets s.t. $A \cup B = C$ & $A \cap B = \phi$. Then, prove that $A = C - B$.

12. For any two sets A & B, prove that $A \cup B = A \cap B$ iff $A = B$.

13. Prove that $n\{P[P(P(\phi))]\} = 4$

14. Prove that (a) $(A - B) \cap B = \phi$. (b) $A \cap B' = \phi \Rightarrow A \subset B$.

15. Let A, B & C be sets s.t. $A \cup B = C$ and $A \cap B = \phi$. Then prove $A = C - B$

16. In a survey of 100 students, the number of students studying the various languages were found as English only 18; Eng but not Hindi 23; Eng & Sanskrit 8; Eng 26; Sanskrit 48; Sanskrit & Hindi; no language 24. Find (a) How many stu were studying Hindi? (b) How many stu were studying Eng & Hindi?

17. Find the domain & range of the functions (a) $f(x) = \frac{x-2}{3-x}$

(b) $f(x) = \frac{x}{1+x^2}$ (c) $f(x) = \frac{1}{\sqrt{x-5}}$ (d) $f(x) = \sqrt{16-x^2}$ (e) $f(x) = \frac{x^2-9}{x-3}$

(e) $f(x) = \frac{4-x}{x-4}$ (f) $f(x) = \frac{1}{2-\sin 4x}$ (g) $f(x) = \frac{|x-1|}{x-1}$ (h) $f(x) = \sqrt{\log\left(\frac{5x-x^2}{6}\right)}$