

الف) $\sqrt{\frac{x^3-4x}{x^3-x}} \rightarrow \frac{x^3-4x}{x^3-x} \geq 0 \quad \frac{x(x^2-4)}{x(x-1)(x+1)}$ -1

$\rightarrow \frac{-1}{x-1} + \frac{0}{x} + \frac{1}{x+1} \Rightarrow D_f = (-1, 0) \cup (0, 1) \cup (1, \infty)$

ب) $\sqrt{\frac{x^3-x^2}{x^3-x}} \rightarrow \frac{x^2(x-1)}{x(x^2-1)} = \frac{x^2(x-1)(x+1)}{x(x-1)(x+1)} \Rightarrow x(x-1)(x+1) \neq 0$

$x \neq 0 \quad x \neq 1 \quad x \neq -1$

$D_f = \mathbb{R} - \{-1, 0, 1\} \quad \frac{1}{x} (-\infty, -1) \cup (-1, 0) \cup (0, 1) \cup (1, \infty)$

$\frac{-1}{x-1} + \frac{1}{x} - \frac{1}{x+1}$

الف) $\frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| > 0 \quad |x| > -x \rightarrow D_f = \mathbb{R}^+$ -2

ب) $\frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \quad x \neq 0$ مختلف علامت کیسے سے ضرب آنا مولو ہوگا نہ ہوگا
 $D_f = \mathbb{R}$

الف) $\sqrt{2-|x|} \quad 2-|x| \geq 0 \rightarrow |x| \leq 2 \rightarrow x \leq 2 \Rightarrow D_f = (-\infty, 2]$ -3

ب) $\frac{1}{\sqrt{2-[x]}} \quad 2-[x] > 0 \rightarrow [x] < 2 \rightarrow x < 2 \Rightarrow D_f = (-\infty, 2)$

الف) $y = \sqrt{[x-\frac{1}{\mu}] + [x+\frac{\mu}{\mu}]} \rightarrow [x-\frac{1}{\mu}] + [x+\frac{\mu}{\mu}] \geq 0 \rightarrow [x+\frac{\mu}{\mu}-1] + [x+\frac{\mu}{\mu}] \geq 0$ -4

$\rightarrow [x+\frac{\mu}{\mu}] - 1 + [x+\frac{\mu}{\mu}] \rightarrow 2[x+\frac{\mu}{\mu}] \geq 1 \rightarrow [x+\frac{\mu}{\mu}] \geq \frac{1}{2} \rightarrow x+\frac{\mu}{\mu} \geq 1$

$\rightarrow x \geq \frac{1}{\mu} \rightarrow [\frac{1}{\mu}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{\mu}] + [-x+\frac{1}{\mu}]} \rightarrow \sqrt{[x-\frac{1}{\mu}] + [-(x-\frac{1}{\mu})]} \rightarrow \begin{cases} a \in \mathbb{Z} [a] + [-a] = 0 \\ a \notin \mathbb{Z} [a] + [-a] = -1 \end{cases}$

$\Rightarrow x - \frac{1}{\mu} \in \mathbb{Z} \rightarrow D_f = \{x | x = k + \frac{1}{\mu}, k \in \mathbb{Z}\}$



الف) $\frac{y}{\sin n - 1} \rightarrow \sin n - 1 \neq 0$ - 5
 $\sin n \neq 1 \rightarrow D = R - \left\{ \frac{\pi}{2} + 2k\pi \right\}$

ب) $y = \frac{y}{y \sin^2 n - 1} \quad y \sin^2 n - 1 \neq 0$
 $\sin^2 n \neq \frac{1}{y} \rightarrow \sin n \neq \pm \frac{\sqrt{y}}{y}$
 $\rightarrow D_f = R - \left\{ \frac{\pi}{2} + \frac{k\pi}{y} \right\}$

الف) $y = \sqrt{y \sin n - 1} \quad y \sin n - 1 \geq 0$ - 6
 $\sin n \geq \frac{1}{y} \rightarrow D = R - \left[\frac{\pi}{2} + \frac{k\pi}{y}, \frac{3\pi}{2} + \frac{k\pi}{y} \right]$
 ب) $y = \sqrt{\cos n - 1} \quad \cos n - 1 \geq 0$
 $\cos n \geq 1 \rightarrow \cos n = 1 \quad D = \{2k\pi\}$

الف) $\cos y = |n| - y \quad -1 \leq |n| - y \leq 1$ - 7
 $y \leq |n| \leq y + 1 \quad D = [-y - 1, -y] \cup [y, y + 1]$

ب) $y = \arcsin(n^y - yn + 1) \quad -1 \leq n^y - yn + 1 \leq 1$
 $\begin{cases} n^y - yn + 1 \geq -1 \rightarrow n^y - yn + 2 \geq 0 \rightarrow (n - y)(n - 1) \geq 0 \quad (1) \\ n^y - yn + 1 \leq 1 \rightarrow n^y - yn \leq 0 \rightarrow n(n - y) \leq 0 \quad (2) \end{cases}$

(1) $\frac{1}{+} \frac{y}{-} \frac{1}{+}$ (2) $\frac{0}{+} \frac{y}{-} \frac{y}{+}$ - 8
 $D_f = [0, 1] \cup [y, y]$

الف) $y = \sqrt{y \log_y (n - y)} \rightarrow n - y > 0$ - 8
 $n > y$

ب) $y \log(n^y - n) \rightarrow n^y - n > 0$
 $n(n - 1)(n + 1) > 0 \rightarrow D = (-1, 0) \cup (1, +\infty)$
 $n = 0, 1, -1$

الف) $g = \frac{\mu}{f^n + 1}$ $f^n + 1 \rightarrow +$ $D = R$ -9

ب) $\frac{\mu}{f^n - 1}$ $f^n - 1 \neq 0$ $n \neq 0$ $D = R - \{0\}$

ج) $\frac{\mu}{f^n - 2}$ $f^n \neq 2 \rightarrow n \neq \log_f 2 = \frac{1}{f}$ $D = R - \{\frac{1}{f}\}$

د) $\frac{\mu}{f^n - 3}$ $f^n \neq 3$ $n \neq \log_f 3 \rightarrow D = R - \{\log_f 3\}$

الف) $(f^{n+1})! \rightarrow f^{n+1} \in \mathbb{W}$ -10
 $f^{n+1} = k \quad k \in \mathbb{W}$
 $f^n = k - 1 \rightarrow n = \frac{k-1}{f} \quad D_f = \{n \mid n = \frac{k-1}{f}, k \in \mathbb{W}\}$

ب) $g = \left(\frac{\mu n - \nu}{\mu n - \omega} \right)!$ $\frac{\mu n - \nu}{\mu n - \omega} \in \mathbb{W}$ $\frac{\mu n - \nu}{\mu n - \omega} = k \quad k \in \mathbb{W}$

$$\mu n - \nu = \mu k n - \omega k$$

$$\mu n - \mu k n = \nu - \omega k$$

$$\mu n (1 - k) = \nu - \omega k$$

$$n = \frac{\nu - \omega k}{\mu - \mu k}$$

$$D_f = \{n \mid n = \frac{\omega k - \nu}{\mu k - \mu}, k \in \mathbb{W}\}$$