

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

Ⓟ ✓

$\rightarrow \frac{-1}{x-4} + \frac{0}{x-1} + \frac{1}{x+1} \geq 0 \Rightarrow D_f = (-1, 0) \cup (0, 1) \cup (4, \infty)$

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

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

$\frac{-1}{x-1} + \frac{1}{x} - \frac{1}{x+1} \geq 0$

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

ب) $\frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \quad x > 0$
 $D_f = \mathbb{R}^+$
 مختلف حالات پر غور کرنا ضروری ہے
 $x > 0 \Rightarrow x|x| = x^2 > 0$
 $x < 0 \Rightarrow x|x| = -x^2 < 0$
 $x = 0 \Rightarrow x|x| = 0$

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

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

$\rightarrow x \geq 1 - \frac{\mu}{\nu} \rightarrow [\frac{1}{\nu}, +\infty)$ Ⓟ ✓

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
 $\sin n \neq 1 \rightarrow D = R - \left\{ \frac{\pi}{y} + yk\pi \right\}$

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

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

الف) $\cos y = |n| - y$ $-1 \leq |n| - y \leq 1$ - 7
 $y \leq |n| \leq y + 2 \quad D = [-y - 2] \cup [y, y + 2]$

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

$\textcircled{1} \quad \begin{array}{c} -2 \quad -1 \\ + \quad - \quad + \end{array}$ $\textcircled{2} \quad \begin{array}{c} -2 \quad 0 \\ + \quad - \quad + \end{array}$ Ⓟ $D_f = [-2, -1] \cup [0, 1]$

الف) $y = \sqrt{y \log_y (n - y)}$ $n - y > 0$ - 8
 $y > y$ Ⓟ $y \log_y (n - y)$
 $\log_y n \leq y \rightarrow n - y \leq y \rightarrow n \leq 11$ Ⓟ $D_f = (2, 11]$

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

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

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

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

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

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

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

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

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

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