

2 Design single phase  $\rightarrow$  1.  $V_{peak} = 325.25$

Given:  $V_{in} = 230 \text{ V RMS } 50 \text{ Hz}$   $P_o = 3.3 \text{ kW}$   $V_{dc} = 400 \text{ V}$

Maintain a ripple of 5% of at DC link o/p.

$$\therefore \Delta V = \frac{5}{100} \times 400 = 20 \text{ V}$$

$$P = 50 \text{ Hz} \Rightarrow \text{ripple frequency} = 100 \text{ Hz} = f_{in}$$

$$C = \frac{P_o}{2\pi f_{in} V_{dc} \Delta V_o} = \frac{3.3 \times 10^3}{2 \times \pi \times 100 \times 400 \times 20} = \underline{\underline{656.6 \mu\text{F}}}$$

$$\boxed{C = 656.6 \mu\text{F}}$$

For 3 phase  $\rightarrow$  Frequency =  $6 \times 50 \therefore$  3 phase  
 $= 300 \text{ Hz}$

$$\therefore C = \frac{3.3 \times 10^3}{2 \times \pi \times 300 \times 400 \times 20} = \underline{\underline{218.9 \mu\text{F}}}$$

$$\boxed{C = 218.9 \mu\text{F}}$$

~~Reqd~~  $I_{dc} = \frac{3.3 \times 10^3}{400} = 8.25 \text{ A}$

$$\boxed{R_{load} = \frac{V_{dc}}{I_{dc}} = \underline{\underline{48.48 \Omega}}}$$