

$$\frac{\overset{\text{Square}}{1^2}}{1 + \omega_c^2 R^2 C^2} = \cancel{\frac{1}{2}}$$

$$2 \cdot 1^2 = 1 + \omega_c^2 R^2 C^2$$

$$2 = 1 + \omega_c^2 R^2 C^2$$

$$2 - 1 = \omega_c^2 R^2 C^2$$

$$1 = \omega_c^2 R^2 C^2$$

$$\text{Taking square root of both sides}$$

$$\sqrt{1} = \sqrt{\omega_c^2 R^2 C^2}$$

$$1 = \omega_c RC$$

$$\therefore \omega_c = \frac{1}{RC}$$