Q2. Find the coefficient of x in the expansion of $(1 - 3x + 1x^2)(1 - x)^{16}$.

Sol: $(1 - 3x + 1x^2)(1 - x)^{16}$

$$= (1 - 3x + 7x^2)({}^{16}C_0 - {}^{16}C_1 x^1 + {}^{16}C_2 x^2 + \ldots + {}^{16}C_{16} x^{16})$$
$$= (1 - 3x + 7x^2)(1 - 16x + 120x^2 + \ldots)$$

$\therefore$ Coefficient of $x = -16 - 3 = -19$