



7. The sum of coefficients of integral powers of x in the binomial expansion of $(1 - 2\sqrt{x})^{50}$ is:

- (1) $\frac{1}{2}(3^{50} + 1)$ (2) $\frac{1}{2}(3^{50})$ (3) $\frac{1}{2}(3^{50} - 1)$ (4) $\frac{1}{2}(2^{50} + 1)$

Answer:

We know that

$$(1 - 2\sqrt{x})^{50} = 50C_0(-2\sqrt{x})^0 + 50C_1(-2\sqrt{x})^1 + 50C_2(-2\sqrt{x})^2 + 50C_3(-2\sqrt{x})^3 + \dots + 50C_{50}(-2\sqrt{x})^{50} \rightarrow (1)$$

$$(1 + 2\sqrt{x})^{50} = 50C_0(2\sqrt{x})^0 + 50C_1(2\sqrt{x})^1 + 50C_2(2\sqrt{x})^2 + 50C_3(2\sqrt{x})^3 + \dots + 50C_{50}(2\sqrt{x})^{50} \rightarrow (2)$$

Putting $x=1$

Adding equation (1) and (2) we get

$$1 + 3^{50} = 2(1 + 50C_2 2^2 + \dots + 50C_{50} 2^{50})$$

$$\text{Or } 1 + 50C_2 2^2 + \dots + 50C_{50} 2^{50} = \frac{1+3^{50}}{2}$$

Correct option is (1) $\frac{1}{2}(3^{50} + 1)$