Question 6:
On substituting the value of various T-ratios, we get

$$\left(\sin^2 30° + 4\cot^2 45° - \sec^2 60°\right)\left(\csc^2 45° \sec^2 30\right)$$

$$= \left[\left(\frac{1}{2}\right)^2 + 4 \times (1)^2 - (2)^2\right]\left[\left(\sqrt{2}\right)^2 \times \left(\frac{2}{\sqrt{3}}\right)^2\right]$$

$$= \left(\frac{1}{4} + 4 - 4\right)\left(2 \times \frac{4}{3}\right)$$

$$= \frac{1}{4} \times \frac{8}{3} = \frac{2}{3}$$

Question 7:
On substituting the value of various T-ratios, we get

$$\frac{4}{\cot^2 30°} + \frac{1}{\sin^2 30°} - 2\cos^2 45° - \sin^2 0°$$

$$= \frac{4}{\left(\sqrt{3}\right)^2} + \frac{1}{\left(\frac{1}{2}\right)^2} - 2 \times \left(\frac{1}{\sqrt{2}}\right)^2 - 0$$

$$= \frac{4}{3} + \frac{4}{1} - \frac{2}{2} - 0$$

$$= \frac{8 + 24 - 6 - 0}{6}$$

$$= \frac{26}{6} = \frac{13}{3}$$

Question 8:
On substituting the value of various T-ratios, we get

$$\frac{\tan^2 60° + 4\cos^2 45° + 3\csc^2 60° + 2\cos^2 90°}{2\csc 30° + 3\sec 60° - \frac{7}{3}\cot^2 30°}$$

$$= \frac{\left(\sqrt{3}\right)^2 + 4 \times \left(\frac{1}{\sqrt{2}}\right)^2 + 3 \times \left(\frac{2}{\sqrt{3}}\right)^2 + 2 \times (0)^2}{2 \times \frac{2}{1} + 3 \times \frac{2}{1} - \frac{7}{3} \times \left(\sqrt{3}\right)^2}$$

$$= \frac{3 + 2 + 4}{4 + 6 - 7} = \frac{9}{3} = 3$$

********** END *********