Question 15:

$$2\left(\frac{\cos 65^\circ}{\sin 25^\circ}\right) - \frac{\tan 20^\circ}{\cot 70^\circ} - \sin 90^\circ + \tan 5^\circ \tan 35^\circ \tan 60^\circ \tan 55^\circ \times \tan 85^\circ$$

$$= 2\left(\frac{\cos(90^\circ - 25^\circ)}{\sin 25^\circ}\right) - \frac{\tan(90^\circ - 70^\circ)}{\cot 70^\circ} - 1 + \tan 5^\circ \tan 35^\circ \times \sqrt{3} \times \tan 55^\circ \times \tan 85^\circ$$

$$= 2\left(\frac{\sin 25^\circ}{\sin 25^\circ}\right) - \frac{\cot 70^\circ}{\cot 70^\circ} - 1 + \tan 5^\circ \tan 35^\circ \times \sqrt{3} \times \tan(90^\circ - 35^\circ) \times \tan(90^\circ - 5^\circ)$$

$$= 2 - 1 - 1 + \tan 5^\circ \tan 35^\circ \times \sqrt{3} \times \cot 35^\circ \cot 5^\circ$$

$$= 0 + \tan 5^\circ \tan 35^\circ \times \sqrt{3} \times \frac{1}{\tan 35^\circ} \times \frac{1}{\tan 5^\circ} = \sqrt{3}$$

Question 16:

$$\frac{\cos 70^\circ}{\sin 20^\circ} + \frac{\cos 55^\circ \operatorname{cosec} 35^\circ}{\tan 5^\circ \tan 25^\circ \tan 45^\circ \tan 65^\circ \tan 85^\circ}$$

$$= \frac{\cos(90^\circ - 20^\circ)}{\sin 20^\circ} + \frac{\cos 55^\circ \operatorname{cosec}(90^\circ - 55^\circ)}{\tan 5^\circ \tan 25^\circ \tan 45^\circ \tan(90^\circ - 25^\circ) \tan(90^\circ - 5^\circ)}$$

$$= \frac{\sin 20^\circ}{\sin 20^\circ} + \frac{\cos 55^\circ \sec 55^\circ}{\tan 5^\circ \tan 25^\circ \tan 45^\circ \times \cot 25^\circ \cot 5^\circ}$$

$$= 1 + \frac{\cos 55^\circ \times \frac{1}{\cos 55^\circ}}{\tan 5^\circ \tan 25^\circ \times 1 \times \frac{1}{\tan 25^\circ} \times \frac{1}{\tan 5^\circ}} = 1 + 1 = 2$$

Question 17:

$$\frac{\sin 70^\circ}{\cos 20^\circ} + \frac{\operatorname{cosec} 36^\circ}{\sec 54^\circ} - \frac{2\cos 43^\circ \operatorname{cosec} 47^\circ}{\tan 10^\circ \tan 40^\circ \tan 50^\circ \tan 80^\circ}$$

$$= \frac{\sin(90^\circ - 20^\circ)}{\cos 20^\circ} + \frac{\operatorname{cosec}(90^\circ - 54^\circ)}{\sec 54^\circ} - \frac{2\cos 43^\circ \operatorname{cosec}(90^\circ - 54^\circ)}{\tan 10^\circ \tan 40^\circ \tan(90^\circ - 40^\circ) \tan(90^\circ - 10^\circ)}$$

$$= \frac{\cos 20^\circ}{\cos 20^\circ} + \frac{\sec 54^\circ}{\sec 54^\circ} - \frac{2\cos 43^\circ \sec 43^\circ}{\tan 10^\circ \tan 40^\circ \cot 40^\circ \cot 10^\circ}$$

$$= 1 + 1 - \frac{2 \times \cos 43^\circ \times \frac{1}{\cos 43^\circ}}{\tan 10^\circ \tan 40^\circ \times \frac{1}{\tan 40^\circ} \times \frac{1}{\tan 10^\circ}}$$

$$= 1 + 1 - 2 = 0$$

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