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Section A 1 mark each

Q.1  $(\sec^2 \theta - 1)(1 - \operatorname{cosec}^2 \theta) =$

Q.2  $\cot^2 \theta - \frac{1}{\sin^2 \theta} =$

Q.3 Given that  $\sin \theta = \frac{a}{b}$ , then  $\cos \theta$  is equal to

(a)  $\frac{b}{\sqrt{b^2 - a^2}}$       (b)  $\frac{b}{a}$       (c)  $\frac{\sqrt{b^2 - a^2}}{a}$       (d)  $\frac{a}{\sqrt{b^2 - a^2}}$

Q.4 If  $\sin \theta - \cos \theta = 0$ , then the value of  $(\sin^4 \theta + \cos^4 \theta)$  is

(a) 1      (b)  $\frac{3}{4}$       (c)  $\frac{1}{2}$       (d)  $\frac{1}{4}$

Q.5 Evaluate  $(1 + \cot \theta - \cos \theta)(1 + \tan \theta + \sec \theta)$

Q.6 If  $x = a \sec \theta \cos \phi$ ;  $y = b \sec \theta \sin \phi$  and  $z = c \tan \theta$ , then  $\frac{x^2}{a^2} + \frac{y^2}{b^2} =$

(a)  $\frac{z^2}{c^2}$       (b)  $1 - \frac{z^2}{c^2}$       (c)  $\frac{z^2}{c^2} - 1$       (d)  $1 + \frac{z^2}{c^2}$

Q.7 If  $\cos A + \cos^2 A = 1$ , then  $\sin^2 A + \sin^2 A =$

(a) -1      (b) 0      (c) 1      (d) 2

Section B 2 marks each

Q.8 Prove that  $\frac{\sec 72^\circ}{\operatorname{cosec} 18^\circ} + \frac{\sin 59^\circ}{\cos 31^\circ} = 2$

Q.9 If  $\sin 2\theta = \sqrt{3}$ , find  $\theta$

Section C 3 marks each

Q.10 Prove that  $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$ , if  $\sin \theta + \cos \theta = \sqrt{2} \cos \theta$

Q.11 Prove that  $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \sec \theta + \tan \theta$

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Section D 4 marks each

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Q.12 If  $a \cos^3 \theta + 3 \cos \theta \sin^2 \theta = m$  and  $a \sin^3 \theta + 3 \cos^2 \theta \sin \theta = n$ ,

Prove that  $(m+n)^{2/3} + (m-n)^{2/3} = 2a^{2/3}$

Q.13 If  $\sec \theta = x + \frac{1}{4x}$ , prove that  $\sec \theta + \tan \theta = 2x$  or  $\frac{1}{2x}$

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