

and so

$$(I^*\omega)_e = (-1)^p \omega_e.$$

Thus $(-1)^p I^*\omega$ is the right-invariant p -form which agrees with ω at e .

(iv) [4 marks]

$$\begin{aligned} d\hat{\alpha}^a &= d(-I^*\alpha^a) = -I^*d\alpha^a \\ &= -I^*\left(\frac{1}{2}C_{bc}^a \alpha^b \wedge \alpha^c\right) \\ &= \frac{1}{2}C_{bc}^a (I^*\alpha^b) \wedge (I^*\alpha^c) \\ &= \frac{1}{2}C_{bc}^a (-\hat{\alpha}^b) \wedge (-\hat{\alpha}^c) \\ &= \frac{1}{2}C_{bc}^a \hat{\alpha}^b \wedge \hat{\alpha}^c. \end{aligned}$$