Consider the sigmoid function $g(z) = \frac{1}{1+e^{-z}}$

(A) **[Ans]** when $z = 0$, $g(z) = 0.5$

(B) when $z$ is negative, $g(z)$ is also negative.

(C) **[Ans]** $g(z)$ is always in the range of $[0, 1]$

(D) $g(z)$ is always in the range of $[-1, 1]$

Consider the sigmoid function $g(\alpha, z) = \frac{1}{1+e^{-\alpha z}}$ where $\alpha$ is a positive real number.

(A) if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z

(B) if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \leq g(\alpha_2, z)$ for all z

(C) if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z in the range $[-1, 1]$

(D) **[Ans]** if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z in the range $[1, 2]$

(E) if $\alpha_1 > \alpha_2$, then $g(\alpha_1, z) \geq g(\alpha_2, z)$ for all z in the range $[-2, -1]$

Consider the sigmoid function $g(z) = \frac{1}{1+e^{-z}}$ Then $g'(z)$ i.e., derivative of $g(z)$ with respect to z

(A) **[Ans]** is always positive for all values of $z$

(B) is constant, i.e., derivative is independent of $z$.

(C) $\frac{1}{1+e^{z}}$

(D) **[Ans]** $\frac{e^{-z}}{(1+e^{-z})^2}$

(E) **[Ans]** $g(z)(1 - g(z))$

Consider the sigmoid function $g(z) = \frac{1}{1+e^{-z}}$ Then $1 - g(z)$ is

(A) **[Ans]** is in the range of $[0, 1]$.

(B) $\frac{1}{1+e^{z}}$

(C) **[Ans]** $\frac{e^{-z}}{1+e^{-z}}$

(D) is in the range of $[-1, 0]$.

(E) **[Ans]** is in the range of $[-1, +1]$.

You know the popular sigmoid function $g(z) = \frac{1}{1+e^{-z}}$, and also the $\tanh(z) = \frac{e^{z}-e^{-z}}{e^{z}+e^{-z}}$

(A) $tanh(z)$ is in the range of $[0, 1]$

(B) **[Ans]** $tanh(z)$ is in the range of $[-1, +1]$

(C) **[Ans]** $tanh(z) = 2g(2z) - 1$

(D) **[Ans]** when $z = 0$, $tanh(z)$ is 0.

(E) when $z = 0$, $tanh(z)$ is 0.5.