Multiple Choice Questions in Basic Quantum Mechanics

Module 1: Introduction & Basic Mathematical Preliminaries

1.1 $\nabla^2\left(\frac{1}{r}\right) =$

(a) $\nabla^2\left(\frac{1}{r}\right) = 0$

(b) $\nabla^2\left(\frac{1}{r}\right) = -4\pi\delta\ \mathbf{r}$

(c) $\nabla^2\left(\frac{1}{r}\right) = +4\pi\delta\ \mathbf{r}$

(d) $\nabla^2\left(\frac{1}{r}\right) = \delta\ \mathbf{r}$

[Answer (b)]

1.2 Consider a function given by $f\ x = e^{-|x|}$. Calculate $\frac{d^2 f}{dx^2}$.

(a) $\frac{d^2 f}{dx^2} = f\ x$

(b) $\frac{d^2 f}{dx^2} = -f\ x$

(c) $\frac{d^2 f}{dx^2} = f\ x + 2\delta\ x$

(d) $\frac{d^2 f}{dx^2} = f\ x - 2\delta\ x$

[Answer (d)]