3. Area under the curve between $\frac{\sin^2\left(\frac{W_{ml}}{2}\right)t}{W^2_{ml}}$ and W_{ml} is proportional-to

(a) t^2 (b) t

(c) $1/t$ (d) $1/t^2$.

4. $[\hat{L}_x, \hat{L}_y]$ is given by

(a) $\hbar L_z$ (b) $\frac{i}{\hbar} L_z$

(c) $-i\hbar L_z$ (d) $i\hbar \hat{L}_z$.

5. The continuity equation is given by

(a) $\frac{\partial p}{\partial t} + Div\, S = 0$ (b) $\frac{\partial^2 p}{\partial t^2} + Div\, S = 0$

(c) $\frac{\partial p}{\partial t} + Grad\, S = 0$ (d) $\frac{\partial S}{\partial t} + Div\, p = 0$.

Fill up the blanks :

6. A state function can be expressed by a _____ in an infinite dimensional space by imagining an axis for each function ψ_i.

7. The first order time independent perturbed energy for the non-degenerate case is _____.

8. The four possible combinations of 'l' and 'm' for $n = 2$ in the case of hydrogen atom are _____.

9. $[\hat{J}_x, \hat{J}_y]$ is _____.

10. Dirac matrix 'α' in terms of Pauli's spin matrix 'σ' is given by _____.

Match the following :

11. Bra and ket vectors	(a) $\frac{-\hbar^2}{2m}(\nabla_1^2 + \nabla_2^2) - \frac{ze^2}{r_1} - \frac{ze^2}{r_2} + \frac{e^2}{r_{12}}$
12. Hamiltonian for helium atom by perturbation method	(b) Quantisation of energy
13. Time dependent perturbation method	(c) $\langle j_1 m_1 J_2 m_2 \mid j_1 j_2 j_m \rangle$
14. C.G. Coefficients	(d) $\left(\nabla^2 - \frac{1}{c^2}\frac{\partial^2}{\partial t^2}\right)\psi = \frac{m_0^2 c^2}{\hbar^2}\psi$
15. K.G. equation	(e) Dirac.