Uncertainty principle and Schrodinger wave equation

1. The uncertainty principle was enunciated by
(a) Einstein (b) Heisenberg
(c) Rutherford (d) Pauli

2. According to heisenberg uncertainty principle
(a) $E = mc^2$
(b) $\Delta x \times \Delta p \geq \frac{h}{4\pi}$
(c) $\lambda = \frac{h}{p}$
(d) $\Delta x \times \Delta p = \frac{h}{6\pi}$

3. "The position and velocity of a small particle like electron cannot be simultaneously determined." This statement is
(a) Heisenberg uncertainty principle
(b) Principle of de Broglie's wave nature of electron
(c) Pauli's exclusion principle
(d) Aufbau's principle

4. In Heisenberg's uncertainty equation $\Delta x \times \Delta p \geq \frac{h}{4\pi}$; Δp stands for
(a) Uncertainty in energy
(b) Uncertainty in velocity
(c) Uncertainty in momentum
(d) Uncertainty in mass

5. Which one is not the correct relation in the following
(a) $h = \frac{E}{v}$ (b) $E = mc^2$
(c) $\Delta x \times \Delta p = \frac{h}{4\pi}$ (d) $\lambda = \frac{h}{mv}$

6. The maximum probability of finding an electron in the d_{xy} orbital is
(a) Along the *x*-axis
(b) Along the *y*-axis
(c) At an angle of 45^o from the x and *y*-axes
(d) At an angle of 90^o from the x and *y*-axes

7. Simultaneous determination of exact position and momentum of an electron is
(a) Possible
(b) Impossible
(c) Sometimes possible sometimes impossible
(d) None of the above

8. If uncertainty in the position of an electron is zero, the uncertainty in its momentum would be
(a) Zero (b) $< \frac{h}{2\lambda}$
(c) $> \frac{h}{2\lambda}$ (d) Infinite

9. The possibility of finding an electron in an orbital was conceived by
(a) Rutherford
(b) Bohr
(c) Heisenberg
(d) Schrodinger

10. Uncertainty principle gave the concept of
(a) Probability
(b) An orbital
(c) Physical meaning of $\Psi$the Ψ^2
(d) All the above

11. The uncertainty principle and the concept of wave nature of matter was proposed by ..... and ..... respectively
(a) Heisenberg, de Broglie
(b) de-Broglie, Heisenberg
(c) Heisenberg, Planck
(d) Planck, Heisenberg

12. The uncertainty in momentum of an electron is $1 \times 10^{-5} kg - m/s$. The uncertainty in its position will be $(h = 6.62 \times 10^{-34} kg - m^2/s)$
(a) $1.05 \times 10^{-28} m$
(b) $1.05 \times 10^{-26} m$
(c) $5.27 \times 10^{-30} m$
(d) $5.25 \times 10^{-28} m$

13. The uncertainty in the position of a moving bullet of mass 10 gm is $10^{-5} m$. Calculate the uncertainty in its velocity
(a) $5.2 \times 10^{-28} m/sec$
(b) $3.0 \times 10^{-28} m/sec$
(c) $5.2 \times 10^{-22} m/sec$
(d) $3 \times 10^{-22} m/sec$

14. The equation $\Delta x . \Delta p \geq \frac{h}{4\pi}$ shows
(a) de-Broglie relation
(b) Heisenberg's uncertainty principle
(c) Aufbau principle
(d) Hund's rule

15. Which quantum number is not related with Schrodinger equation
(a) Principal (b) Azimuthal
(c) Magnetic (d) Spin

16. Uncertainty in position of a 0.25 g particle is 10^{-5}. Uncertainty of velocity is $(h = 6.6 \times 10^{-34} Js)$
(a) 1.2×10^{34} (b) 2.1×10^{-29}
(c) 1.6×10^{-20} (d) 1.7×10^{-9}

17. The uncertainty in momentum of an electron is $1 \times 10^{-5} kgm/s$. The uncertainity in its position will be $(h = 6.63 \times 10^{-34} Js)$
(a) $5.28 \times 10^{-30} m$
(b) $5.25 \times 10^{-28} m$
(c) $1.05 \times 10^{-26} m$
(d) $2.715 \times 10^{-30} m$

18. According to Heisenberg's uncertainty principle, the product of uncertainties

in position and velocities for an electron of mass $9.1 \times 10^{-31} kg$ is

(a) $2.8 \times 10^{-3} m^2 s^{-1}$

(b) $3.8 \times 10^{-5} m^2 s^{-1}$

(c) $5.8 \times 10^{-5} m^2 s^{-1}$

(d) $6.8 \times 10^{-6} m^2 s^{-1}$

19. For an electron if the uncertainty in velocity is Δv, the uncertainty in its position (Δx) is given by

(a) $\frac{hm}{4\pi\Delta v}$ (b) $\frac{4\pi}{hm\Delta v}$

(c) $\frac{h}{4\pi m\Delta v}$ (d) $\frac{4\pi\ m}{h\ .\ \Delta v}$

20. Orbital is

(a) Circular path around the nucleus in which the electron revolves

(b) Space around the nucleus where the probability of finding the electron is maximum

(c) Amplitude of electrons wave

(d) None of these