Atomic Structure MCQs

Bohr's Atomic Model

1. Who proposed the quantum model of the hydrogen atom?
   a) Ernest Rutherford
   b) Niels Bohr
   c) J.J. Thomson
   d) James Chadwick
2. According to Bohr’s model, electrons revolve around the nucleus in:
   a) Any path
   b) Elliptical orbits
   c) Discrete orbits
   d) None of the above
3. In Bohr's model, the energy levels are:
   a) Continuous
   b) Quantized
   c) Random
   d) None of the above
4. Bohr's atomic model was primarily developed for:
   a) Helium
   b) Lithium
   c) Hydrogen
   d) Neon
5. The principal quantum number (n) in Bohr's model represents:
   a) The shape of the orbit
   b) The energy level
   c) The spin of the electron
   d) The type of orbit
6. When an electron jumps from a higher energy level to a lower energy level:
   a) Energy is absorbed
   b) Energy is released
   c) No energy change occurs
   d) Energy is destroyed
7. The line spectrum of hydrogen is explained by:
   a) Rutherford’s model
   b) Bohr's model
   c) Thomson’s model
   d) Dalton's model
8. The maximum number of electrons in a shell is given by:
   a) 2n
   b) $2n^2$

c) n^2
d) n

9. The energy of an electron in an orbit is:
   a) Positive
   b) Zero
   c) Negative
   d) Infinite
10. Bohr's theory could not explain the spectra of:
   a) Hydrogen
   b) Helium
   c) Multielectron atoms
   d) None of the above
11. According to Bohr, the angular momentum of an electron in an orbit is:
   a) Quantized
   b) Continuous
   c) Zero
   d) Infinite
12. The radius of the nth orbit in Bohr's model is proportional to:
   a) n
   b) n^2
   c) n^3
   d) 1/n
13. The energy difference between two energy levels is:
   a) Constant
   b) Zero
   c) Quantized
   d) Infinite
14. Bohr’s model is based on the concept of:
   a) Wave-particle duality
   b) Uncertainty principle
   c) Quantized orbits
   d) Probable electron clouds
15. The first orbit in Bohr’s model is also known as the:
   a) Ground state
   b) Excited state
   c) Ionization state
   d) None of the above
16. The emission of light in Bohr's model occurs when:
   a) Electrons move to higher energy levels
   b) Electrons fall to lower energy levels
   c) Protons are added to the nucleus
   d) Neutrons are emitted
17. Bohr's model introduced the concept of:
   a) Continuous spectra
   b) Atomic number

c) Stationary states
d) Mass number

18. The spectral lines observed in hydrogen are called:
    a) Emission lines
    b) Absorption lines
    c) Both a and b
    d) None of the above
19. Which of the following could not be explained by Bohr's model?
    a) Line spectra of hydrogen
    b) Zeeman effect
    c) Stability of atoms
    d) Energy levels
20. Bohr's model assumes that electrons do not:
    a) Radiate energy in stable orbits
    b) Have mass
    c) Have charge
    d) Move
21. The Balmer series in the hydrogen spectrum is observed when:
    a) Electrons fall to n = 1
    b) Electrons fall to n = 2
    c) Electrons fall to n = 3
    d) Electrons fall to n = 4
22. The Lyman series in the hydrogen spectrum is observed in the:
    a) Visible region
    b) Infrared region
    c) Ultraviolet region
    d) Microwave region
23. The energy of an electron in the nth orbit is given by:
    a) $E = -13.6/n^2$ eV
    b) $E = 13.6/n^2$ eV
    c) $E = -13.6n^2$ eV
    d) $E = 13.6n^2$ eV
24. According to Bohr's model, the angular momentum of an electron in the nth orbit is:
    a) $nh/2\pi$
    b) nh
    c) $h/2\pi$
    d) $n^2h/2\pi$
25. Bohr’s model was a modification of:
    a) Dalton’s model
    b) Rutherford’s model
    c) Thomson’s model
    d) Quantum mechanical model
26. In Bohr's model, an electron in a higher orbit has:
    a) Higher energy
    b) Lower energy

c) Zero energy
d) Infinite energy

27. The Paschen series in the hydrogen spectrum corresponds to transitions ending at:
    a) n = 1
    b) n = 2
    c) n = 3
    d) n = 4
28. Bohr’s model could explain:
    a) Fine structure of spectral lines
    b) Hyperfine structure of spectral lines
    c) Gross structure of spectral lines
    d) Quantum mechanical nature of electrons
29. The concept of quantization in Bohr’s model is similar to:
    a) Newton's laws
    b) Planck's quantum theory
    c) Dalton’s atomic theory
    d) Faraday’s laws
30. The Sommerfeld extension of Bohr's model introduced:
    a) Circular orbits
    b) Elliptical orbits
    c) Hyperbolic orbits
    d) Parabolic orbits

Answer Key

1. b
2. c
3. b
4. c
5. b
6. b
7. b
8. b
9. c
10. c
11. a
12. b
13. c
14. c
15. a
16. b
17. c
18. a
19. b
20. a
21. b
22. c
23. a
24. a
25. b
26. a
27. c
28. c
29. b
30. b