Quantum number, Electronic configuration and Shape of orbitals

31. The two electrons in K sub-shell will differ in
(a) Principal quantum number
(b) Azimuthal quantum number
(c) Magnetic quantum number
(d) Spin quantum number

32. A completely filled d -orbital (d^{10})
(a) Spherically symmetrical
(b) Has octahedral symmetry
(c) Has tetrahedral symmetry
(d) Depends on the atom

33. If magnetic quantum number of a given atom represented by –3, then what will be its principal quantum number
(a) 2 (b) 3
(c) 4 (d) 5

34. The total number of orbitals in an energy level designated by principal quantum number n is equal to
(a) $2n$ (b) $2n^2$
(c) n (d) n^2

35. The number of orbitals in the fourth principal quantum number will be
(a) 4 (b) 8
(c) 12 (d) 16

36. Which set of quantum numbers are not possible from the following
(a) $n = 3, l = 2, m = 0, s = -\frac{1}{2}$
(b) $n = 3, l = 2, m = -2, s = -\frac{1}{2}$
(c) $n = 3, l = 3, m = -3, s = -\frac{1}{2}$
(d) $n = 3, l = 0, m = 0, s = -\frac{1}{2}$

37. The four quantum number for the valence shell electron or last electron of sodium (Z = 11) is
(a) $n = 2, l = 1, m = -1, s = -\frac{1}{2}$
(b) $n = 3, l = 0, m = 0, s = +\frac{1}{2}$
(c) $n = 3, l = 2, m = -2, s = -\frac{1}{2}$
(d) $n = 3, l = 2, m = 2, s = +\frac{1}{2}$

38. The explanation for the presence of three unpaired electrons in the nitrogen atom can be given by
(a) Pauli's exclusion principle
(b) Hund's rule
(c) Aufbau's principle
(d) Uncertainty principle

39. The maximum energy is present in any electron at
(a) Nucleus

(b) Ground state
(c) First excited state
(d) Infinite distance from the nucleus

40. The electron density between $1s$ and $2s$ orbital is
(a) High
(b) Low
(c) Zero
(d) None of these

41. For ns orbital, the magnetic quantum number has value
(a) 2 (b) 4
(c) – 1 (d) 0

42. The maximum number of electrons that can be accommodated in the M^{th} shell is
(a) 2 (b) 8
(c) 18 (d) 32

43. For a given value of quantum number l, the number of allowed values of m is given by
(a) $l+2$ (b) $2l+2$
(c) $2l+1$ (d) $l+1$

44. The number of radial nodes of 3*s* and 2*p* orbitals are respectively.
(a) 2, 0 (b) 0, 2
(c) 1, 2 (d) 2, 1

45. Which of the sub-shell is circular
(a) $4s$ (b) $4f$
(c) $4p$ (d) $4d$

46. Which electronic configuration for oxygen is correct according to Hund's rule of multiplicity
(a) $1s^2, 2s^2 2p_x^2 2p_y^1 2p_z^1$
(b) $1s^2, 2s^2 2p_x^2 2p_y^2 2p_z^0$
(c) $1s^2, 2s^2 2p_x^3 2p_y^1 2p_z^0$
(d) None of these

47. If value of azimuthal quantum number l is 2, then total possible values of magnetic quantum number will be
(a) 7 (b) 5
(c) 3 (d) 2

48. The type of orbitals present in Fe is
(a) s
(b) s and p
(c) s, p and d
(d) s, p, d and f

49. The shape of d_{xy} orbital will be
(a) Circular (b) Dumb-bell
(c) Double dumb-bell (d) Trigonal

50. In any atom which sub-shell will have the highest energy in the following
(a) $3p$ (b) $3d$
(c) $4s$ (d) $3s$

51. Which electronic configuration is not observing the $(n+l)$ rule
(a) $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^1, 4s^2$

(b) $1s^2, 2s^2sp^6, 3s^23p^63d^7, 4s^2$
(c) $1s^2, 2s^22p^6, 3s^23p^63d^5, 4s^1$
(d) $1s^2, 2s^22p^6, 3s^23p^63d^8, 4s^2$

52. The four quantum numbers of the outermost orbital of K (atomic no. =19) are

(a) $n = 2, l = 0, m = 0, s = +\frac{1}{2}$

(b) $n = 4, l = 0, m = 0, s = +\frac{1}{2}$

(c) $n = 3, l = 1, m = 1, s = +\frac{1}{2}$

(d) $n = 4, l = 2, m = -1, s = +\frac{1}{2}$

53. The angular momentum of an electron depends on
(a) Principal quantum number
(b) Azimuthal quantum number
(c) Magnetic quantum number
(d) All of these

54. The electronic configuration of copper $(_{29}Cu)$ is
(a) $1s^2, 2s^22p^6, 3s^23p^63d^9, 4s^2$
(b) $1s^2, 2s^22p^6, 3s^23p^63d^{10}, 4s^1$
(c) $1s^2.2s^22p^6, 3s^23p^6, 4s^24p^6$
(d) $1s^2, 2s^22p^6, 3s^23p^63d^{10}$

55. The number of orbitals in $2p$ sub-shell is
(a) 6 (b) 2
(c) 3 (d) 4

56. The number of orbitals in d sub-shell is
(a) 1 (b) 3
(c) 5 (d) 7

57. A sub-shell $l = 2$ can take how many electrons
(a) 3 (b) 10
(c) 5 (d) 6

58. Pauli's exclusion principle states that
(a) Two electrons in the same atom can have the same energy
(b) Two electrons in the same atom cannot have the same spin
(c) The electrons tend to occupy different orbitals as far as possible
(d) Electrons tend to occupy lower energy orbitals preferentially
(e) None of the above

59. For d electrons, the azimuthal quantum number is
(a) 0 (b) 1
(c) 2 (d) 3

60. For p -orbital, the magnetic quantum number has value
(a) 2 (b) 4, – 4
(c) – 1, 0, +1 (d) 0