CHAPTER 5

ATOMIC STRUCTURE
MCQs

Q.1 Splitting of spectral lines when atoms are subjected to strong electric field is called

(a) Zeeman effect (b) Stark effect
(c) Photoelectric effect (d) Compton effect

Q.2 The velocity of photon is

(a) independent of its wavelength
(b) depends on its wavelength
(c) equal to square of its amplitude
(d) depends on its source

Q.3 The nature of positive rays depend on

(a) the nature of electrode
(b) the nature of discharge tube
(c) the nature of residual gas
(d) all of the above

Q.4 The wave number of the light emitted by a certain source is 2 x 106 m. The wavelength of this light is

(a) 500 nm (b) 500 m
(c) 200 nm (d) 5 x 10–1 m

Q.5 Rutherford's model of atom failed because

(a) the atom did not have a nucleus and electrons
(b) it did not account for the attraction between protons and neutrons
(c) it did account for the stability of the atom
(d) there is actually no space between the nucleus and the electrons

Q.6 Bohr's model of atom is contradicted by

(a) Planck's quantum theory
(b) Pauli exclusion principle
(c) Heisenberg uncertainty principle

(d) All of the above

Q.7 Quantum number value for 2p orbitals are

(a) n = 2, l = 1 (b) n = 1, l = 2

(c) n = 1, l = 0 (d) n = 2, l = 0

Q.8 In the ground state of an atom, the electron is present

(a) in the nucleus (b) in the second shell

(c) nearest to the nucleus (d) farthest from the nucleus

Q.9 When the 6d orbital is complete the entering electron goes into

(a) 7f (b) 7s

(c) 7p (d) 7d

Q.10 Orbitals having same energy are called

(a) hybrid orbitals (b) valence orbitals

(c) degenerate orbitals (d) d–orbitals

Q.11 The e/m value for the positive rays is maximum for

(a) hydrogen (b) helium

(c) nitrogen (d) oxygen

Q.12 Neutron was discovered by Chadwick in

(a) 1935 (b) 1930

(c) 1932 (d) 1934

Q.13 The velocity of photon is

(a) equal to square of its amplitude

(b) independent of its wavelength

(c) Equal to its wave number

(d) equal to the velocity of light

Q.14 Quantum number values for 3p orbitals are

(a) n = 0, l = 3 (b) n = 3, l = 1

(c) n = 2, l = 1 (d) n = 1, l = 3

Q.15 The radius of first orbit of hydrogen atom

(a) 0.329 Ao (b) 0.429 Ao

(c) 0.529 Ao (d) 0.229 Ao

Q.16 All atoms are principally composed of few fundamental particles which are in number

(a) 2 (b) 3

(c) 4 (d) 5

Q.17 Which scientist gave the name of electron to the cathode rays

(a) Planck (b) Einstein

(c) Stoney (d) Bohr

Q.18 The divisibility of atom was showed by

(a) Stoney (b) J.J. Thomson

(c) Millikan (d) Rutherford

Q.19 The nature of cathode rays remains the same irrespective of the material used for

(a) gas (b) cathode

(c) glass (d) electrode

Q.20 Mass of electron is

(a) 9.1 x 10–31 kg (b) 9.109 x 10–32 gm

(c) 8.1 x 10–31 g (d) 9.1 x 10–31 mg

Q.21 The charge on an electron is

(a) 1.602 x 10–19 c (b) 1.602 x 10–18 c

(c) 1.602 x 10–19 c (d) 1.602 x 10–21 c

Q.22 The charge on the proton is

(a) + 1.602 x 10–19 c (b) zero

(c) – 1.602 x 1019 c (d) 1.602 x 10–19 c

Q.23 The charge on the neutron is

(a) 1.602 x 10–19 c (b) zero

(c) – 1.602 x 10–19 c (d) + 1.602 x 10–19 c

Q.24 The calculated e/m value of electron is

(a) 1.602 x 1019 c kg–1 (b) 1.7588 x 10–11 c kg–1

(c) 1.7588 x 10–13 c kg–1 (d) 1.759 x 109 c kg

Q.25 The mass of proton is

(a) 9.11 x 10–31 kg (b) 1.676 x 10–27 kg

(c) 1.60 x 10–19 kg (d) 1.675 x 10–27 kg

Q.26 The mass of neutron is

(a) 1.675 x 10–27 kg (b) 1.675 x 10–25 kg

(c) 9.11 x 10–31 kg (d) 1.60 x 10–19 kg

Q.27 The charge on electron was determined by

(a) J.J. Thomson (b) Millikan
(c) Rutherford (d) Bohr

Q.28 Alpha particles are identical to
(a) hydrogen atoms (b) helium atoms
(c) helium nuclei (d) fast moving electrons

Q.29 Bombardment of Beryllium with alpha particles generates
(a) proton (b) neutron
(c) electron (d) positron

Q.30 The colour of the glow produced in the discharge tube depends upon
(a) gas (b) electrodes
(c) composition of gas (d) pressure

Q.31 When the pressure of the gas in discharge tube is reduced, which of the following becomes more prominent
(a) gas glows (b) gas ionizes
(c) a discharge takes place (d) gas conducts electricity

Q.32 Goldstein discovered that besides the cathode rays, another type of rays are produced in the discharge tube which are called
(a) alpha rays (b) beta rays
(c) positive rays (d) gamma rays

Q.33 The e/m value for the positive rays in the discharge tube depends upon
(a) nature of electrode use
(b) nature of gas used
(c) composition of the gas
(d) pressure

Q.34 The distance between the two adjacent crests or troughs is called
(a) wave number (b) frequency
(c) wavelength (d) amplitude

Q.35 The value of Planck's constant "h" is
(a) 6.625 x 10–34 cal (b) 6.625 x 10–34 J sec
(c) 6.625 x 10–34 kJ (d) 6.625 x 10–34 k cal

Q.36 In the Bohr's model of atom the electron in an energy level emits or absorbs energy only when it

(a) remains in the same energy level
(b) dies out
(c) changes its energy level
(d) jumps away

Q.37 The energy associated with an electron resolving in first orbit is

(a) – 2.178 x 10–18 k J/mol
(b) – 1313.31 k J/mol
(c) – 328.32 k J/mol
(d) – 82.08 k J/mol

Q.38 The regions of spectrum are

(a) three (b) seven
(c) eight (d) five

Q.39 The dispersion of the components of white light when it is passed through prism is called

(a) rainbow (b) light pattern
(c) refraction (d) spectrum

Q.40 Which of the following colours has the shortest wavelength in the visible spectrum of light

(a) red (b) blue
(c) violet (d) green

Q.41 Which of the following colours has the longest wavelength in the visible spectrum of light

(a) red (b) blue
(c) violet (d) green

Q.42 A spectrum containing wavelength of all wavelengths is called

(a) continuous (b) discontinuous
(c) line (d) atomic

Q.43 A spectrum showing only certain colours of light is called

(a) continuous (b) line
(c) discontinuous (d) band

Q.44 The wavelength range of visible spectrum is

(a) 400–750 nm (b) 300–400 nm
(c) 350–600 nm (d) 200–400 nm

Q.45 The spectral lines of Lyman series (uv region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.46 The spectral lines of Balmer series (visible region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.47 The spectral lines of Paschen series (visible region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.48 The spectral lines of Bracket series (visible region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.49 A dual character of matter particles in motion was postulated by
(a) De–Broglie (b) Planck
(c) Einstein (d) Schrodinger

Q.50 If an electron is moving with a velocity of 2.188 x 106 m/s then its wavelength will be
(a) 0.33 x 106 nm (b) 0.33 x 10–2 nm
(c) 0.33 nm (d) 0.22 nm

Q.51 If a stone of 1gm is many with a velocity of 10m/s then its wavelength will be
(a) 6.65 x 10–30 m (b) 6.65 x 10–25 m
(c) 6.65 x 10–28 m (d) 6.65 x 10–12 m

Q.52 The space around the nucleus where the probability of finding the electron is maximum is called
(a) an orbital (b) an orbit
(c) energy level (d) a shell

Q.53 Which orbital has dumb–bell shape

(a) s–orbital (b) p–orbital
(c) d–orbital (d) f–orbital

Q.54 Which of the following quantum numbers describes energy of an electron in an atom

(a) principal quantum (b) azimuthal quantum
(c) magnetic quantum (d) spin quantum

Q.55 Which of the following quantum numbers describes shape of an electron in an atom

(a) principal quantum (b) azimuthal quantum
(c) magnetic quantum (d) spin quantum

Q.56 The degenerate orbital in p–subshell is

(a) 2 (b) 3
(c) 5 (d) 7

Q.57 When 4p orbital is complete the entering electron goes into

(a) 4d (b) 4f
(c) 5s (d) 5p

Q.58 x + *l* value for 3d will be

(a) 3 (b) 4
(c) 5 (d) 6

Q.59 Maximum number of electrons in 3f orbitals is

(a) 2 (b) zero
(c) 6 (d) 14

Q.60 Maximum number of electrons in M–shell is

(a) 2 (b) 8
(c) 18 (d) 32

Q.61 An orbital can have maximum electrons

(a) 2 (b) 8
(c) 18 (d) 6

Q.62 n + *l* value for 4f will

(a) 2 (b) 5
(c) 7 (d) 9

Q.63 When a spectrum of light is formed by the radiation given off by a substance it is called

(a) line spectrum (b) continuous spectrum
(c) emission spectrum (d) absorption spectrum

Q.64 Neutron was discovered by

(a) Chadwick (b) Bohr
(c) J.J. Thomson (d) Einstein

Q.65 Cathode rays can drive a small paddle wheel which shows that they

(a) are positively charged
(b) possess momentum
(c) do not possess momentum
(d) none of these

Q.66 Slow neutrons are generally more effective than fastness for the purpose of

(a) effusion (b) fission
(c) penetration (d) absorption

Q.67 The wavelength associated with the moving stone

(a) can be measured by many methods
(b) cannot be measured by any method
(c) can be measure by some method
(d) none of these

Q.68 Radius of orbit of an electron and velocity of electron are

(a) directly proportional to each other
(b) inversely proportional to each other
(c) independent to each other
(d) none of these

Q.69 The values of magnetic quantum number give us information about the number of orbitals in a

(a) small shell (b) orbit
(c) subshell (d) none of these

Q.70 Which of the following terms are used for the number of positive charges on the nucleus of an atom

(a) atomic number (b) atomic mass
(c) nuclear charge (d) atomic charge

Q.71 The uncertainty principle was stated by
(a) de Broglie (b) Heinsenberg
(c) Einstein (d) Schrodinger

Q.72 When a pressure in a discharge tube is reduced, which of the following phenomenon becomes very prominent
(a) gas conducts electricity
(b) a discharge takes place
(c) gas ionizes
(d) gas glows

Q.73 Atom bomb is based on the principle of
(a) nuclear fusion
(b) nuclear fission
(c) fusion and fission both
(d) radioactivity

Q.74 A spinning electron creates
(a) magnetic field (b) electric field
(c) quantum field (d) none of these

Q.75 The volume of space in which there is 95% chance of finding an electron is
(a) orbit (b) atomic orbital
(c) degenerate orbital (d) quantized orbital

Q.76 Planck's equation is
(a) E = mc2 (b) E = hv
(c) E = hv2 (d) E = mc

Q.77 In an atom, the electrons
(a) are stationary in various energy levels
(b) are distributed in three dimensional charge cloud around the nucleus
(c) embedded in space around the nucleus
(d) revolve around the nucleus at random

Q.78 The mass number of an element is equal to

(a) number of electrons in an atom
(b) number of protons and neutrons in the nucleus
(c) number of protons in the nucleus
(d) number of neutrons in the nucleus

Q.79 The energy of bounded electron in H atom is
(a) positive (b) negative
(c) zero (d) none of these

Q.80 Quantum number which has symbol "n" is called
(a) principal quantum (b) Azimuthal quantum
(c) Spin quantum (d) Magnetic quantum

ANSWERS

Questions	1	2	3	4	5
Answers	b	a	c	a	c
Questions	6	7	8	9	10
Answers	c	a	c	c	c
Questions	11	12	13	14	15
Answers	a	c	d	b	c
Questions	16	17	18	19	20
Answers	b	c	b	d	a
Questions	21	22	23	24	25
Answers	c	a	b	b	b
Questions	26	27	28	29	30
Answers	a	b	c	b	c
Questions	31	32	33	34	35
Answers	c	c	b	c	b

Questions	36	37	38	39	40
Answers	c	b	c	d	c
Questions	41	42	43	44	45
Answers	a	a	b	a	a
Questions	46	47	48	49	50
Answers	b	c	d	a	c
Questions	51	52	53	54	55
Answers	a	a	b	a	b
Questions	56	57	58	59	60
Answers	b	c	c	b	c
Questions	61	62	63	64	65
Answers	a	c	c	a	b
Questions	66	67	68	69	70
Answers	b	b	b	c	a
Questions	71	72	73	74	75
Answers	b	b	b	a	b
Questions	76	77	78	79	80
Answers	b	b	b	b	a