RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 100 Mins **CHEMISTRY TEST 1 STRUCTURE OF ATOM AND NUCLEAR CHEMISTRY 1** **Marks : 244**

1. Uncertainty in position of an electron (mass = 9.1 x 10^{-28g}) moving with a velocity of 3 x 10^4 cm/s accurate upto 0.001% will be (use $\frac{h}{4\pi}$ in uncertainty expression where h = 6.626 x 10^{-27}erg $^-$s)
   a) 5.76 cm b) 7.68 cm c) 1.93 cm d) 3.84 cm
2. The energy of a photon is 3x10^{-12} ergs. What is its wavelength in nm?(h=6.62x10^{-27} erg.sec; c=3x10^{10}cm.s^{-1})
   a) 662 nm b) 1324 nm c) 66.2 nm d) 6.62 nm
3. If ionisation potential for hydrogen atom is 13.6 eY, then ionisation potential for He^+ will be:
   a) 54.4 eV b) 6.8 eV c) 13.6 eV d) 24.5 eV
4. A body of mass 10 g is moving with a velocity of 100 ms^{-1}. The wavelength associated with it is
   a) 6.626 x 10^{-7} m b) 6.626 x 10^{-34}m c) 6.626 x 10^{-4} m d) 6.626 x 10^{-35} m
5. A particle X moving with a certain velocity has a debroglie wave length of $1A^0$. If particle Y has a mass of 25% that of X and velocity 75% that of X, debroglies wave length of Y will be:
   a) 3 A^0 b) 5.33 A^0 c) 6.88 A^0 d) 48 A^0
6. Match the constants given in column I with their values given in column II and mark the appropriate choice.

Column I		Column II	
(A)	Rydberg constant	(i)	6.626 x 10^{-34} J s
(B)	Planck's constant	(ii)	3.00 x 10^8 m s^{-1}
(C)	Velocity of light	(iii)	750 x 10^{-9} m
(D)	Wavelength of red light	(iv)	109,677 cm^{-1}

   a) (A) ⟶ (iii), (B) ⟶ (ii), (C) ⟶ (i), (D) ⟶ (iv) b) (A) ⟶ (ii), (B) ⟶ (iv), (C) ⟶ (i), (D) ⟶ (iii)
   c) (A) ⟶ (i), (B) ⟶ (iii), (C) ⟶ (iv), (D) ⟶ (ii) d) (A) ⟶ (iv), (B) ⟶ (i), (C) ⟶ (ii), (D) ⟶ (iii)
7. A hydrogen atom in the ground state is excited by monochromatic ratiation of wavelength λ $\mathring{A}$. The resulting spectrum consists of maximum 15 different lines. What is the wavelength λ ?
   a) 937.3$\mathring{A}$ b) 1025$\mathring{A}$ c) 1236$\mathring{A}$ d) 1120$\mathring{A}$
8. Number of angular nodes for 4d orbital is _____
   a) 4 b) 3 c) 2 d) 1
9. What will the ratio of the wavelength of the first line to that of second line of Paschen series of H atom?
   a) 256 : 175 b) 175 : 256 c) 15 : 16 d) 16 : 15
10. Sulphur = 35 (34.96903 u) emits a β-particle but no γ-ray . The product is chlorine = 35 (34.96885 u). The maximum energy emitted by the β-particle is:
    a) 16.758 MeV b) 1.6758 MeV c) 0.16758 MeV d) 0.016758 MeV
11. According to law of photochemical equivalence the energy absorbed (in ergs/mole) is given as (h = 6.62 x 10^{-27} ergs, $C = 3 \times 10^{10}\ \mathrm{cm\ s^{-1}}$) $\mathrm{N_A} = 6.02 \times 10^{23}\ \mathrm{mol^{-1}}$
    a) $\frac{1.196\times10^{16}}{\lambda}$ b) $\frac{1.196\times10^{8}}{\lambda}$ c) $\frac{2.859\times10^{5}}{\lambda}$ d) $\frac{2.859\times10^{16}}{\lambda}$
12. There is no difference between a 2p and 3p orbitals regarding:
    a) Value of n b) Size c) Energy d) Shape
13. The number of nodes and nodal planes in 4p orbital are respectively
    a) 2,1 b) 1,2 c) 2,3 d) 3,2

14. The angular momentum of an electron in a given stationary state can be expressed as $m_e vr = n\frac{h}{2\pi}$. Based on this expression an electron can move only in those orbits for which its angular momentum is
    a) equal to n b) integral multiple of $\frac{h}{2\pi}$ c) multiple of n d) equal to $\frac{h}{2\pi}$ only
15. An electron, a proton and an alpha particle have kinetic energies of 16E, 4E and E respectively. What is the qualitative order of their de Broglie wavelengths?
    a) $\lambda_e > \lambda_p = \lambda_a$ b) $\lambda_p = \lambda_a > \lambda_e$ c) $\lambda_p > \lambda_e > \lambda_a$ d) $\lambda_a < \lambda_e >> \lambda_p$
16. The total number of electrons that can be accommodated in all the orbitals having principal quantum number 2 and azimuthal quantum number 1 are:
    a) 2 b) 4 c) 6 d) 8
17. The energy of an electron in the first Bohr's orbit ofa hydrogen atom is 2.18 x 10^{-18}J. Its energy in the second orbit would be
    a) -1.09 x 10^{-18} J b) -4.36 x 10^{-18} J c) -5.45 x 10^{-19} J d) -8.72 x 10^{-18} J
18. The probability of finding out an electron at a point within an atom is proportional to the
    a) square of the orbital wave function i.e., Ψ^2 b) orbital wave function i.e., Ψ c) Hamiltonian operator i.e., H
    d) principal quantum number i.e., n
19. The half-life of a substance in a certain enzyme -catalyzed reaction is 138 s. The time required for the concentration of the substance to fall from 1.28 $1.28 \mathrm{mgL}^{-1}$ to $0.04 \mathrm{mgL}^{-1}$ is:
    a) 414 s b) 552 s c) 690 s d) 276 s
20. A wave has a frequency of 3x10^{15} sec^{-1}. The energy of that photon is
    a) 1.6 x 10^{-12} erg b) 3.2 x 10^{-11} erg c) 2.0 x 10^{-11} erg d) 3x 10^{15} erg
21. An orbital is described with the help of a wave function. Since many wave functions are possible for an electron, there are many atomic orbitals. When atom is placed in a magnetic field the possible number of orientations for an orbital of azimuthal quantum number 3 is:
    a) three b) two c) five d) seven
22. Nitrogen atom has 3 unpaired electrons in its ground state. It can be explained by
    a) Auf-bau principle b) Pauli.s principle c) Hund.s rule d) None of these
23. The electronic configuration of gadolinium (Atomic number 64) is
    a) [Xe]$4f^8$, $5d^9$, $6s^2$ b) [Xe]$4f^7$, $5d^1$, $6s^2$ c) [Xe)$4f^6$, $5d^2$, $6s^2$ d) [Xe)$4f^3$, $5d^5$, $6s^2$
24. Consider the following pairs of ions
    i) Sc^{+3} and Ti^{+4} ii) Mn^{+2} and Fe^{+2} iii) Fe^{+2} and CO^{+3} iv) Cu^{+} and Zn^{+2}
    Among these pairs of ions, isoclcctronic pairs would include
    a) ii, iii and iv b) i, iii and iv c) i, ii and iv d) i, ii and iii
25. The value of Planck's constant is 6.63 x 10^{-34} Js. The velocity of light is 3.0 x 10^8 ms^{-1}, Which value is closest to the wavelength in nanometers of a quantum of light with frequency of 8 x 10^{15} S^{-1}?
    a) 4 x 10^1 b) 3 x 10^7 c) 2 x 10^{-25} d) 5 x 10^{-18}
26. Bohr's theory is applicable to
    a) Li^{2+} b) Li^{+} c) He^{+} d) Both 1 and 3
27. If the ionisation energy of hydrogen atom is 13.6 eV, the energy required to excite it from ground state to the next higher state is approximately:
    a) 3.4 eV b) 10.2 eV c) 17.2 eV d) 13.6 eV
28. Accrording to the Bohr Theory which of the following transitions in the hydrogen atom will given rise to the least energetic photon?
    a) n = 6 to n = 1 b) n = 5 to n = 4 c) n = 6 to n = 5 d) n = 5 to n = 3
29. An electron is revolving in the 2^{nd} orbit of He^{+} ion. To this if 12.1 eV of energy supplied. Then to which orbit it will be excited.
    a) 6 b) 8 c) 4 d) 2
30. The frequency of the spectral line obtained when the electron in n = 3 of Hydrogen atom drops to the ground state is
    a) 2.925x10^{15} Hertz b) 2.925x10^{13} Hertz c) 2.925x10^{14} Hertz d) 36559x10^{10} Hertz

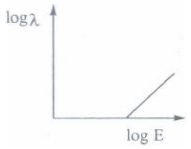
31. The energy of an electromagnetic radiation is 3 x 10^{-12}ergs. What is its wavelength in nanometers? (h = 6.625 x 10^{-27} erg. sec, C = 3 x 10^{10} cm, sec^{-1})
    a) 400 b) 228.3 c) 3000 d) 662.5

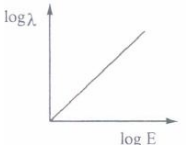
32. The correct set of four quantum numbers for the valence electron of rubidium atom (Z=37) is:
    a) 5, 1 + 1/2 b) 6, 0, 0 + 1/2 c) 5, 0, 0 + 1/2 d) 5, 1, 0 + 1/2

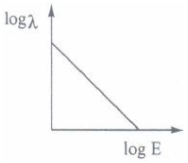
33. The number of angular nodal planes are same in the orbitals:
    a) 3p and 4p b) 3s and 4d c) 4s and 3p d) 4s and 3d

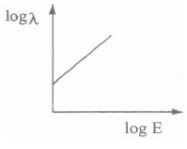
34. The electrons identified by quantum numbers n and 1 can be placed in the order of increasing energy as:
    1. n = 4, l = 1
    2. n = 4, l = 0
    3. n = 3, l = 2
    4. n = 3, l = 1
    a) 3 > 4 < 2 < 1 b) 4 < 2 < 3 < 1 c) 2 < 4 < 1 ≤ 3 d) 1 < 3 ≤ 2 < 4

35. The graph between energy of an electron and its de-Broglie wavelength λ is

    a) 

    b) 

    c) 

    d) 

36. Which of the following is diamagnetic?
    a) He^{+2} b) Sc^{+3} c) Mg^{+2} d) O^{-2}

37. An atom differs from its ion in
    a) Nuclear charge b) Mass number c) Number of electrons d) Number of neutrons

38. The energy of an electron in the nth Bohr orbit of hydrogen atom is:
    a) $-\frac{13.6}{n^4}\text{eV}$ b) $-\frac{13.6}{n^3}\text{eV}$ c) $-\frac{13.6}{n^2}\text{eV}$ d) $-\frac{13.6}{n}\text{eV}$

39. An ion has 18 electrons in the outermost shell, it is:
    a) Cu^+ b) Th^{4+} c) Cs^+ d) K^+

40. Emission of an alpha particle leads to a
    a) decrease of 2 units in the charge of the atom b) increase of 2 units in the mass of the atom
    c) decrease of 2 units in the mass of the atom d) increase of 4 units in the mass of the atom

41. A proton and an electron are accelerated by the same potential difference. If λ_e and λ_p denote the De-broglie wavelength of electron and proton then
    a) $\lambda_e = \lambda_p$ b) $\lambda_e < \lambda_p$ c) $\lambda_e > \lambda_p$ d) No releation between λ_e and λ_p

42. A helium atom at 300 K is moving with a velocity of 2.40 $\times$ 10^2 ms^{-1}. The de-Broglie wavelength is about [At. Wt. of He = 4.0]
    a) 0.416 nm b) 0.83 nm c) 803 Å d) 8000 Å

43. The ionization potential of He^+ in ground state is
    a) 2427 kJ mol^{-1} b) 5249 kJ mol^{-1} c) 7116 kJ mol^{-1} d) 9811 kJ mol^{-1}

44. In how many elements the last electron will have the following set of quantum numbers, n = 3 and l = 1?
    a) 2 b) 8 c) 6 d) 10

45. If n = 6, the correct sequence for filling of electrons will be:
    a) $ns \rightarrow (n-1)f \rightarrow (n-1)d \rightarrow np$ b) $ns \rightarrow (n-1)f \rightarrow (n-2)d \rightarrow np$
    c) $ns \rightarrow (n-2)f \rightarrow (n-1)d \rightarrow np$ d) $ns \rightarrow np(n-1)d \rightarrow (n-2)f$

46. The schrodinger wave equation for hydrogen atom is $\Psi(\text{radial}) = = \frac{1}{16\sqrt{4}}\left(\frac{z}{a_0}\right)^{3/2}$ $\left[(\sigma-1)\left(\sigma^2-8\sigma+12\right)\right]e^{-\sigma/2}$ where ao and z are the constant in which answer can be expressed and maximum position of radial nodes from nucleus are
    a) $\frac{a_0}{Z}, \frac{3a_0}{Z}$ b) $\frac{a_0}{2Z}, \frac{a_0}{Z}$ c) $\frac{a_0}{2Z}, \frac{3a_0}{Z}$ d) $\frac{a_0}{2Z}, \frac{4a_0}{Z}$

47. Which of the following sets of four quantum numbers, an electron will have the highest energy?

a)

	n	l	m	s
(a)	3	2	1	$\frac{1}{2}$

b)

	n	l	m	s
(b)	4	2	-1	$\frac{1}{2}$

c)

	n	l	m	s
(c)	4	1	0	$-\frac{1}{2}$

d)

	n	l	m	s
(d)	5	0	0	$-\frac{1}{2}$

48. An element has 13 electrons in its M shell and 1 electron in N shell in ground state. Identify the element.
a) Copper b) Chromium c) Iron d) Manganese

49. The ratio of energies of two photons of wavelengths 2000 A° and 4000 A°

a) 1:4 b) 4:1 c) 1:2 d) 2:1

50. A human body required 0.01 M activity of radioactive substance after 24 hours. Half-life of radioactive substances is 6 hours. Half-life of radioactive substance is 6 hours. The injection of maximum activity of radioactive substance that can injected will be
a) 0.08 M b) 0.04 M c) 0.32 M d) 0.16 M

51. Read the following statements and mark the incorrect statement.
a) No two electrons in an atom can have all the four quantum numbers same
b) All the orbitals in a subshell are first occupied singly with parallel spins
c) The outer electronic configuration of chromium atom is $3d^4\ 4s^2$
d) Lyman series of hydrogen spectrum lies in ultraviolet region

52. The ratio of the wave lengths of the first line in the Lyman series of the spectrum of Hydorgen atom and the first line in the Balmer series of the spectrum of He^+ is :
a) 20/27 b) 27/20 c) 27/5 d) 5/27

53. The Schrodinger wave equation for hydrogen atom is $\Psi_{2s}= \frac{1}{4\sqrt{2\pi}}\left(\frac{1}{a_0}\right)^{3/2}\left(2-\frac{r_0}{a_0}\right) e^{-r/a_0}$ where a_0 is is Bohr's radius. If the radial node in 2s be at r_0 would be equal to:
a) $\frac{a_0}{2}$ b) $2a_0$ c) $\sqrt{2a_0}$ d) $\frac{a_0}{\sqrt{2}}$

54. Which of the following electron transistions in hydrogen atom will require largest amount of energy?
a) From n = 1 to n = 2 b) From n = 1 to n =3 c) From n = 2 to n =1 d) From n = 3 to n =4

55. In the radial probability distribution curve for the 2s orbital of the hydrogen atom, the minor maximum, the node and the major maximum occur at the following distances from the nucleus respectively
a) 1.1A°,0.53A°,2.6A ° b) 0.53A°, 1.1A°,2.6A° c) 2.6A°,1.1A° ,0.53A° d) 0.53A°,2.116A°,2.6A°

56. The energy of the electron in a hydrogen atom has a negative sign for all possible orbits because:
a)
when the electron is attracted by the nucleus and is present in orbit n, the energy is emitted and its energy is lowered.
b)
when the electron is attracted by the nucleus and is present in orbit n, the energy is absorbed and its energy is increased.
c) when the electron is repelled by the nucleus, the energy is released and its energy is lowered.
d) none of these.

57. In a multi - electron atom, which of the following orbitals described by the three quantum numbers will have the same energy in the absence of magnetic and electric field
i) n = 1, l= 0, m = 0 ii) n = 2, l = 0, m = 0 iii) n = 2, l = 1, m = 1
iv) n = 3,l = 2 m = 1 v) n = 3,l = 2,m = 0
a) i and ii b) ii and iii c) iii and iv d) iv and v

58. The size of a mircorscopic particle is 1 micron and its mass is 6×10^{-13}g. If its position may be measured to within 0.1 % of its size, the uncertainiry in velocity (in cm^{-1}) is approximately
a) $\frac{10^{-7}}{4\pi}$ b) $\frac{10^{-5}}{4\pi}$ c) 10^{-5} d) 10^{-8}

59. A cricket ball of mass 0.5 kg is moving with a velocity of 100 $m.s^{-1}$, the wavelength associated with its motion is:
a) 13.25×10^{-26}m b) 13.25×10^{-34}m c) 13.25×10^{-36}m d) 6.6×10^{-34}m

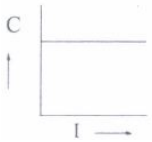
60. Which statement about energy level in H-atom is correct?
    a) Only n and l decide energy level b) Only l decides energy level c) Only n decides energy level
    d) n, l and m decide energy level

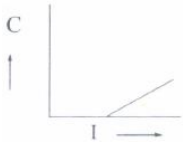
61. If r is the radius of the first orbit, the radius of nth orbit of H-atom is given by
    a) rn^2 b) rn c) $\frac{r}{n}$ d) r^2n^2

62. Carbon- 14 dating method is based on the fact that
    a) carbon-14 fraction is same in all objects b) carbon-14 is highly insoluble
    c) ratio of carbon-14 and carbon-12 is constant d) All of the above

63. The graph between photo electron current (c) and intensity of photon (I)
    a) 

    b) 

    c) 

    d) 

64. For azimuthal quantum number 1 = 3, the maximum number of electrons will be :
    a) 2 b) 6 c) 0 d) 14

65. The electron was shown experimentally to have wave properties by :
    a) de-Broglie b) N Bohr c) Davisson and Germer d) Schrodinger

66. The region where probability density function reduces to zero is called
    a) probability density region b) nodal surfaces c) orientation surfaces d) wave function

67. Compare the energies of two radiations E_1 with wavelength 800 nm and E_2 with wavelength 400 nm.
    a) $E_1=2E_2$ b) $E_1=E_2$ c) $E_2=2E_1$ d) $E_2=-\frac{1}{2}E_1$

68. 

represents
    a) 4s b) 5p c) 3s d) $6d_{xy}$

69. If an electron has spin quantum number $+\frac{1}{2}$ and magnetic quantum number -1, it cannot be present in
    a) d - orbital b) f - orbital c) p - orbital d) s - orbital

70. The wavelength of visible light is
    a) 200 nm - 370 nm b) 780 nm - 890 nm c) 380 nm - 760 nm d) 900 nm - 2000 nm

71. Describe the orbital with following quantum numbers:
    (i) n=3, l=2
    (ii) n=4,l=3
    a) (i) 3p, (ii) 4f b) (i) 3d, (ii) 4d c) (i) 3f, (ii) 4f d) (i) 3d, (ii) 4f

72. Orbital angular momentum depends on _____
    a) l b) n and l c) n and m d) m and s

73. In the radioactive decay, $_{92}X^{232} \rightarrow {}_{89}Y^{220}$, how many α and β-particles are ejected from X to form Y?
    a) 3α and 2β b) 5α and 3β c) 3α and 3β d) 3α and 3β

74. The density of electron cloud of the orbital d_{xy} in yz plane is
    a) Zero b) Maximum c) Not determined d) Infinite

75. For a 3s-orbital $\Psi(3s)= \frac{1}{9\sqrt{3}}\left(\frac{1}{a_0}\right)^{3/2}$ $(6-6\sigma+\sigma^2)e^{-\sigma/2}$; where $\sigma=\frac{2r.\,Z}{3a_0}$ what is the maximum radial distance of node from nucleus?
    a) $\frac{\left(3+\sqrt{3}\right)a_0}{z}$ b) $\frac{a_0}{Z}$ c) $\frac{3}{2}\frac{\left(3+\sqrt{3}\right)a_0}{z}$ d) $\frac{2a_0}{Z}$

76. Electronic configuration of calcium atom can be written as :
    a) $[Ne]4p^2$ b) $[Ar]4s^2$ c) $[Ne]4s^2$ d) $[Kr]4p^2$

77. The age of most ancient geological formation is estimated by

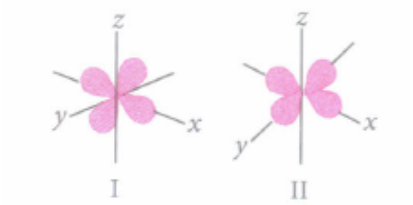
a) potassium-argon method b) carbon-14 dating method c) radium- silicon method
d) uranium-lead method

78. For an e^- in a hydrogen atom, the wave function Ψ.If is proportional to $e^{-(r/a_0)}$ where a_0 as Bohrs radius; what is the ratio of probability of finding the e^- at the nucleus to the probability of finding it at a_0 the wave function is $\Psi = \frac{1}{\sqrt{\pi}}\left(\frac{1}{a_0}\right)^{3/2} e^{-(r/a_0)}$
a) e b) e^2 c) $1/e^2$ d) Zero

79. Assertion: In Rutherford's α-particle scattering experiment, most of the α-particles were deflected by nearly 180^0.
Reason: The positive charge of the atom is spread throughout the atom that repelled and deflected the positively charged α-particles.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

80. If n and l are principle and azimuhtal quantum numbers respectively, then the expression for calculating the total number of electrons in any energy level is
a) $\sum_{l=0}^{l=n} 2\,(2l+1)$ b) $\sum_{l=1}^{l=n} 2\,(2l+1)$ c) $\sum_{l=0}^{l=n} (2l+1)$ d) $\sum_{l=0}^{l=n-1} 2\,(2l+1)$

81. Observe the given boundary surface diagrams of two orbitals I and II and choose the correct option.



a) I-$d_{x^2-y^2}$, II-d_{yz} b) I-d_{yz}, II-$d_{x^2-y^2}$ c) I-d_{xz}, II-d_{z^2} d) I-d_{xy}, II-dxz

82. The mass of a praticle is 10^{-10}g and its radius is $2x10^{-4}$ cm. If its velocity is 10^{-6} cm sec^{-1} with 0.0001% uncertainity in measurement. the uncertainty in its position is:
a) 5.2 x 10^{-8}m b) 5.2 x 10^{-7}m c) 5.2 x 10^{-6}m d) 5,2 x 10^{-9}m

83. Match the following.

List-I	List-II
a) n = 2, l= 1, m = -1	p) $2p_x$ or $2p_y$
b) n = 4, l = 2, m = 0	q) $4dz^2$
c) n=3,l=1,m=±1	r) $3P_x$ or $3p_y$
d) n = 4, l= 0, m = 0	s) 4s
e) n = 3, l= 2, m = ±2	t) $3dx^2 - y^2$ or 3dxy

a) a-q , b-r , c-p ,d-s e-t b) a-t,b-r, c-s, d-p, e-t c) a-p,b-q, c-r, d-s, e-t d) a-s,b-t,c-r,d-s, e-p

84. The electronic configuration of sodium is
a) $[Ne]3s^2$ b) $[Ne]3s^1$ c) $[Ar]4s^1$ d) $[Ar]4s^2$

85. Assertion: The number of electrons ejected from a metal surface depend upon the frequency of light.
Reason: There is a time lag between the striking of light beam and the ejection of electrons from the metal surface.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

86. If highest magnetic quantum number of a given atom is represented by 3, then what will be its principal quantum number?
a) 2 b) 3 c) 4 d) 1

87. Three elements 'X, 'Y' and 'Z' have atomic numbers 18, 19 and 20 respectively. How many electrons are present in the M shells of these elements?
a) 8,9,10 b) 8,10,13 c) 8,8,8 d) 8,9, 12

88. Electromagnetic radiation of wavelength 242 nm is just sufficient to ionise the sodium atom. What is the ionisation energy of sodium per atom?
    a) 494.5 x 10^{-6} J/atom b) 8169.5 x 10^{-10} J/atom c) 5.85 x 10^{-15} J/atom d) 8.214 x 10^{-19} J/atom
89. No of revolutions made by the electron in one sec in 2nd orbit of Be^{3+}
    a) 1.31 x 10^{16} b) 2.13 x 10^{16} c) 1.23 x 10^{15} d) 2.68 x 10^{14}
90. After 3d-sub level is completely filled the differentiating electron enters into __ sub level.
    a) 4s b) 4p c) 4f d) 5s
91. Assertion: Elements like Rb, Cs, Tl, In, Ga and Sc were discovered when their minerals were analysed by spectroscopic methods.
    Reason: The characteristic lines in atomic spectra can be used in chemical analysis to identify unknown atoms.
    a) If both assertion and reason are true and reason is the correct explanation of assertion
    b) If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false d) If both assertion and reason are false
92. Based on equation $\mathrm{E} = -2.178 \times 10^{-18} \left(\frac{Z^2}{n^2}\right) \mathrm{J}$ certain conclusion are written. which of them is not correct?
    a) Larger the value of n, the larger is the orbit radius
    b) equation can be used to calculate the change in energy when the electron changes orbit.
    c)
    For n = 1. tire electron has a more negative energy, than it does for n = 6 which mean that the electron is more loosely board in the smallest allowed orbit.
    d)
    The negative sign in equation simply means that the energy or electron bound to the nucleus is lower than it wouid be if the electron were at the infinite distance from the nucleus.
93. The angular momentum of electron in 'd' orbital is equal to:
    a) $2\sqrt{3}\hbar$ b) $\hbar$ c) $\sqrt{6}\hbar$ d) $\sqrt{2}\hbar$
94. One microgram of radioactive sodium $_{11}\mathrm{Na}^{24}$ with a half-life of 15 h was injected into a living system for a bio assay. How long will it take for the radioactivity to fall to 25% of the initial value?
    a) 60 h b) 22.5 h c) 375 h d) 30 h
95. What are the possible values of n, l and m_l for an atomic orbital 4f?
    a) n = 4, l = 0, 1, 2, 3, m_l = -2, -1, 0, +1, +2 b) n = 4, l = 3, m_l = -3, -2, -1, 0, +1, +2, +3
    c) n = 4, l = 2, m_l = -2, -1, 0, +1, +2, +3 d) n = 4, l = 0, 1, m_l = -1, 0, +1
96. How many subshells and electrons are associated with n = 4?
    a) 32, 64 b) 16, 32 c) 4, 16 d) 8, 16
97. What is the maximum number of orbitals that can be identified with the following quantum numbers?
    n = 3, l = +1, m_l = 0
    a) 1 b) 2 c) 3 d) 4
98. The atomic number of an element 'M' is 26. How many electrons are present in the M-shell of the element in its M^{3+} state?
    a) 11 b) 15 c) 14 d) 13
99. Which of the following is not permissible arrangement of electrons in an atom?
    a) $n = 5, l = 3, m = 0, s = +1/2$ b) $n = 3, l = 2, m = -3, s = -1/2$
    c) $n = 3, l = 2, m = -2, s = -1/2$ d) $n = 4, l = 0, m = 0, s = +1/2$
100. The energy absorbed by the electron is
    a) 8.5 eV b) 3.4 eV c) 68 eV d) 3.78 eV