EXERCISE-I

Atomic Structure

1. Which of the following is true
(A) Lyman series is a continuous spectrum
(B) Paschen series is a line spectrum in the infrared
(C) Balmer series is a line spectrum in the ultraviolet
(D) The spectral series formula can be derived from the Rutherford model of the hydrogen atom

2. The energy required to knock out the electron in the third orbit of a hydrogen atom is equal to
(A) 13.6 eV (B) $+\frac{13.6}{9}eV$
(C) $-\frac{13.6}{3}eV$ (D) $-\frac{3}{13.6}eV$

3. An electron has a mass of $9.1\times10^{-31}kg$. It revolves round the nucleus in a circular orbit of radius $0.529\times10^{-10}\,metre$ at a speed of $2.2\times10^{6}\,m/s$. The magnitude of its linear momentum in this motion is
(A) $1.1\times10^{-34}\,kg-m/s$ (B) $2.0\times10^{-24}\,kg-m/s$
(C) $4.0\times10^{-24}\,kg-m/s$ (D) $4.0\times10^{-31}\,kg-m/s$

4. In a beryllium atom, if a_0 be the radius of the first orbit, then the radius of the second orbit will be in general
(A) na_0 (B) a_0
(C) n^2a_0 (D) $\frac{a_0}{n^2}$

5. The ionization potential for second *He* electron is
(A) 13.6 eV (B) 27.2 eV
(C) 54.4 eV (D) 100 eV

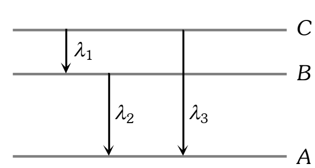
6. The energy required to remove an electron in a hydrogen atom from $n=10$ state is
(A) 13.6 eV (B) 1.36 eV
(C) 0.136 eV (D) 0.0136 eV

7. Every series of hydrogen spectrum has an upper and lower limit in wavelength. The spectral series which has an upper limit of wavelength equal to 18752 Å is
(Rydberg constant $R=1.097\times10^{7}$ *per metre*)
(A) Balmer series (B) Lyman series
(C) Paschen series (D) Pfund series

8. The kinetic energy of the electron in an orbit of radius *r* in hydrogen atom is (*e* = electronic charge)
(A) $\frac{e^2}{r^2}$ (B) $\frac{e^2}{2r}$
(C) $\frac{e^2}{r}$ (D) $\frac{e^2}{2r^2}$

9. Ionization potential of hydrogen atom is 13.6 *V*. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon energy 12.1 *eV*. The spectral lines emitted by hydrogen atoms according to Bohr's theory will be
(A) One (B) Two
(C) Three (D) Four

10. Energy levels A, B, C of a certain atom corresponding to increasing values of energy *i.e.* $E_A<E_B<E_C$. If $\lambda_1,\lambda_2,\lambda_3$ are the wavelengths of radiations corresponding to the transitions *C* to *B*, *B* to *A* and *C* to *A* respectively, which of the following statements is correct



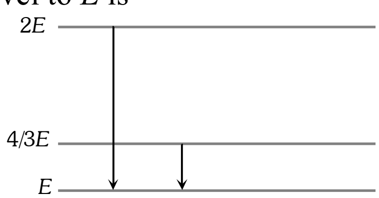
(A) $\lambda_3=\lambda_1+\lambda_2$ (B) $\lambda_3=\frac{\lambda_1\lambda_2}{\lambda_1+\lambda_2}$
(C) $\lambda_1+\lambda_2+\lambda_3=0$ (D) $\lambda_3^2=\lambda_1^2+\lambda_2^2$

11. If the wavelength of the first line of the Balmer series of hydrogen is $6561\,\mathring{A}$, the wavelength of the second line of the series should be

(A) $13122\,\mathring{A}$ (B) $3280\,\mathring{A}$

(C) $4860\,\mathring{A}$ (D) $2187\,\mathring{A}$

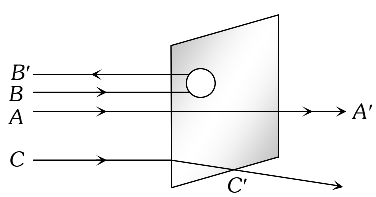
12. The following diagram indicates the energy levels of a certain atom when the system moves from $2E$ level to E, a photon of wavelength λ is emitted. The wavelength of photon produced during its transition from $\frac{4E}{3}$ level to E is



(A) $\lambda/3$ (B) $3\lambda/4$

(C) $4\lambda/3$ (D) 3λ

13. A beam of fast moving alpha particles were directed towards a thin film of gold. The parts A', B' and C' of the transmitted and reflected beams corresponding to the incident parts A, B and C of the beam, are shown in the adjoining diagram. The number of alpha particles in



(A) B' will be minimum and in C' maximum

(B) A' will be maximum and in B' minimum

(C) A' will be minimum and in B' maximum

(D) C' will be minimum and in B' maximum

14. According to Bohr's theory the radius of electron in an orbit described by principal quantum number n and atomic number Z is proportional to

(A) Z^2n^2 (B) $\frac{Z^2}{n^2}$

(C) $\frac{Z^2}{n}$ (D) $\frac{n^2}{Z}$

15. The radius of electron's second stationary orbit in Bohr's atom is R. The radius of the third orbit will be

(A) $3\,R$ (B) $2.25\,R$

(C) $9\,R$ (D) $\frac{R}{3}$

16. If m is mass of electron, v its velocity, r the radius of stationary circular orbit around a nucleus with charge Ze, then from Bohr's first postulate, the kinetic energy $K = \frac{1}{2}mv^2$ of the electron in $C.G.S.$ system is equal to

(A) $\frac{1}{2}\frac{Ze^2}{r}$ (B) $\frac{1}{2}\frac{Ze^2}{r^2}$

(C) $\frac{Ze^2}{r}$ (D) $\frac{Ze}{r^2}$

17. Consider an electron in the n^{th} orbit of a hydrogen atom in the Bohr model. The circumference of the orbit can be expressed in terms of the de Broglie wavelength λ of that electron as

(A) $(0.259)\,n\lambda$ (B) $\sqrt{n}\lambda$

(C) $(13.6)\,\lambda$ (D) $n\lambda$

18. In any Bohr orbit of the hydrogen atom, the ratio of kinetic energy to potential energy of the electron is

(A) 1/2 (B) 2

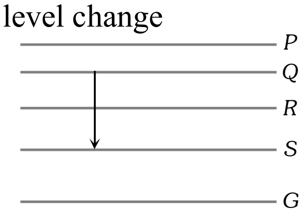
(C) $-1/2$ (D) -2

19. The spectral series of the hydrogen spectrum that lies in the ultraviolet region is the

(A) Balmer series (B) Pfund series

(C) Paschen series (D) Lyman series

20. Figure shows the energy levels P, Q, R, S and G of an atom where G is the ground state. A red line in the emission spectrum of the atom can be obtained by an energy level change from Q to S. A blue line can be obtained by following energy level change



(A) P to Q

(B) Q to R

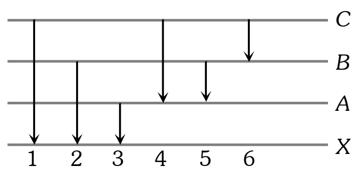
(C) R to S

(D) R to G

21. A hydrogen atom (ionisation potential 13.6 eV) makes a transition from third excited state to first excited state. The energy of the photon emitted in the process is

(A) 1.89 eV (B) 2.55 eV
(C) 12.09 eV (D) 12.75 eV

22. The figure indicates the energy level diagram of an atom and the origin of six spectral lines in emission (*e.g.* line no. 5 arises from the transition from level B to A). The following spectral lines will also occur in the absorption spectrum



(A) 1, 4, 6 (B) 4, 5, 6
(C) 1, 2, 3 (D) 1, 2, 3, 4, 5, 6

23. When a hydrogen atom is raised from the ground state to an excited state

(A) P.E. increases and K.E. decreases
(B) P.E. decreases and K.E. increases
(C) Both kinetic energy and potential energy increase
(D) Both K.E. and P.E. decrease

24. An electron makes a transition from orbit $n = 4$ to the orbit $n = 2$ of a hydrogen atom. The wave number of the emitted radiations (R = Rydberg's constant) will be

(A) $\frac{16}{3R}$ (B) $\frac{2R}{16}$
(C) $\frac{3R}{16}$ (D) $\frac{4R}{16}$

25. In Bohr model of the hydrogen atom, the lowest orbit corresponds to

(A) Infinite energy
(B) The maximum energy
(C) The minimum energy
(D) Zero energy

26. Which of the following transitions in a hydrogen atom emits photon of the highest frequency

(A) $n = 1$ to $n = 2$ (B) $n = 2$ to $n = 1$
(C) $n = 2$ to $n = 6$ (D) $n = 6$ to $n = 2$

27. In terms of Rydberg's constant R, the wave number of the first Balmer line is

(A) R (B) $3R$
(C) $\frac{5R}{36}$ (D) $\frac{8R}{9}$

28. If the ionisation potential of helium atom is 24.6 *volt*, the energy required to ionise it will be

(A) 24.6 eV (B) 24.6 V
(C) 13.6 V (D) 13.6 eV

29. Which of the transitions in hydrogen atom emits a photon of lowest frequency
(n = quantum number)

(A) $n = 2$ to $n = 1$ (B) $n = 4$ to $n = 3$
(C) $n = 3$ to $n = 1$ (D) $n = 4$ to $n = 2$

30. According to Bohr's theory, the expressions for the kinetic and potential energy of an electron revolving in an orbit is given respectively by

(A) $+\frac{e^2}{8\pi\varepsilon_0 r}$ and $-\frac{e^2}{4\pi\varepsilon_0 r}$

(B) $+\frac{8\pi\varepsilon_0 e^2}{r}$ and $-\frac{4\pi\varepsilon_0 e^2}{r}$

(C) $-\frac{e^2}{8\pi\varepsilon_0 r}$ and $-\frac{e^2}{4\pi\varepsilon_0 r}$

(D) $+\frac{e^2}{8\pi\varepsilon_0 r}$ and $+\frac{e^2}{4\pi\varepsilon_0 r}$

31. In a hydrogen atom, which of the following electronic transitions would involve the maximum energy change

(A) From $n = 2$ to $n = 1$ (B) From n=3 to n =1
(C) From $n = 4$ to $n = 2$ (D) From n=3 to n =2

32. In the lowest energy level of hydrogen atom, the electron has the angular momentum

(A) π / h (B) h / π
(C) $h / 2\pi$ (D) $2\pi / h$

33. The minimum energy required to excite a hydrogen atom from its ground state is

(A) 13.6 eV (B) -13.6 eV
(C) 3.4 eV (D) 10.2 eV

34. Ratio of the wavelengths of first line of Lyman series and first line of Balmer series is

(A) 1: 3 (B) 27 : 5
(C) 5 : 27 (D) 4 : 9

35. The Rydberg constant R for hydrogen is

(A) $R=-\left(\frac{1}{4\pi\varepsilon_0}\right).\frac{2\pi^2me^2}{ch^2}$

(B) $R=\left(\frac{1}{4\pi\varepsilon_0}\right).\frac{2\pi^2me^4}{ch^2}$

(C) $R=\left(\frac{1}{4\pi\varepsilon_0}\right)^2.\frac{2\pi^2me^4}{c^2h^2}$

(D) $R=\left(\frac{1}{4\pi\varepsilon_0}\right)^2.\frac{2\pi^2me^4}{ch^3}$

36. The wavelength of the first line of Balmer series is $6563\ \mathring{A}$. The Rydberg constant for hydrogen is about

(A) 1.09×10^7 *per m* (B) 1.09×10^8 *per m*

(C) 1.09×10^9 *per m* (D) 1.09×10^5 *per m*

37. According to Bohr's theory the moment of momentum of an electron revolving in second orbit of hydrogen atom will be

(A) $2\pi h$ (B) πh

(C) $\frac{h}{\pi}$ (D) $\frac{2h}{\pi}$

38. The velocity of an electron in the second orbit of sodium atom (atomic number = 11) is v. The velocity of an electron in its fifth orbit will be

(A) v (B) $\frac{22}{5}v$

(C) $\frac{5}{2}v$ (D) $\frac{2}{5}v$

39. The absorption transitions between the first and the fourth energy states of hydrogen atom are 3. The emission transitions between these states will be

(A) 3 (B) 4

(C) 5 (D) 6

40. The ratio of longest wavelength and the shortest wavelength observed in the five spectral series of emission spectrum of hydrogen is

(A) $\frac{4}{3}$ (B) $\frac{525}{376}$

(C) 25 (D) $\frac{900}{11}$

41. An electron in the n = 1 orbit of hydrogen atom is bound by 13.6 eV energy is required to ionize it is

(A) 13.6 eV (B) 6.53 eV

(C) 5.4 eV (D) 1.51 eV

42. Ionization energy of hydrogen is 13.6 eV. If $h=6.6\times10^{-34}\ J-sec$, the value of R will be of the order of

(A) $10^{10}\ m^{-1}$ (B) $10^7\ m^{-1}$

(C) $10^4\ m^{-1}$ (D) $10^{-7}\ m^{-1}$

43. To explain his theory, Bohr used

(A) Conservation of linear momentum

(B) Conservation of angular momentum

(C) Conservation of quantum frequency

(D) Conservation of energy

44. The ionisation energy of hydrogen atom is 13.6 eV. Following Bohr's theory, the energy corresponding to a transition between the 3rd and the 4th orbit is

(A) 3.40 eV (B) 1.51 eV

(C) 0.85 eV (D) 0.66 eV

45. Hydrogen atoms are excited from ground state of the principal quantum number 4. Then the number of spectral lines observed will be

(A) 3 (B) 6

(C) 5 (D) 2

46. Hydrogen atom emits blue light when it changes from n = 4 energy level to the n = 2 level. Which colour of light would the atom emit when it changes from the n = 5 level to the n = 2 level

(A) Red (B) Yellow

(C) Green (D) Violet

47. In Rutherford scattering experiment, what will be the correct angle for α scattering for an impact parameter b = 0

(A) 90^o (B) 270^o

(C) 0^o (D) 180^o

48. The radius of hydrogen atom in its ground state is $5.3\times10^{-11}\,m$. After collision with an electron it is found to have a radius of $21.2\times10^{-11}\,m$. What is the principal quantum number n of the final state of the atom

(A) n = 4 (B) n = 2

(C) n = 16 (D) n = 3

49. The splitting of line into groups under the effect of electric or magnetic field is called
(A) Zeeman's effect (B) Bohr's effect
(C) Heisenberg's effect (D) Magnetic effect

50. The energy of a hydrogen atom in its ground state is $-13.6\,eV$. The energy of the level corresponding to the quantum number n = 2 (first excited state) in the hydrogen atom is
(A) – 2.72 eV (B) – 0.85 eV
(C) – 0.54 eV (D) – 3.4 eV

51. The first line of Balmer series has wavelength 6563 Å. What will be the wavelength of the first member of Lyman series
(A) 1215.4 Å (B) 2500 Å
(C) 7500 Å (D) 600 Å

52. The wavelength of Lyman series is
(A) $\frac{4}{3\times 10967}\,cm$ (B) $\frac{3}{4\times 10967}\,cm$
(C) $\frac{4\times 10967}{3}\,cm$ (D) $\frac{3}{4}\times 10967\,cm$

53. When hydrogen atom is in its first excited level, its radius is .... its ground state radius
(A) Half (B) Same
(C) Twice (D) Four times

54. Hydrogen atom excites energy level from fundamental state to n = 3. Number of spectrum lines according to Bohr, is
(A) 4 (B) 3
(C) 1 (D) 2

55. Number of spectral lines in hydrogen atom is
(A) 3 (B) 6
(C) 15 (D) Infinite

56. If scattering particles are 56 for 90^o angle then this will be at 60^o angle
(A) 224 (B) 256
(C) 98 (D) 108

57. When an electron in hydrogen atom is excited, from its 4th to 5th stationary orbit, the change in angular momentum of electron is (Planck's constant: $h = 6.6\times 10^{-34}\,J$-s)
(A) $4.16\times 10^{-34}\,J$-s (B) $3.32\times 10^{-34}\,J$-s
(C) $1.05\times 10^{-34}\,J$-s (D) $2.08\times 10^{-34}\,J$-s

58. Energy of electron in a orbit of H-atom is
(A) Positive
(B) Negative
(C) Zero
(D) Nothing can be said

59. The concept of stationary orbits was proposed by
(A) Neil Bohr (B) J.J. Thomson
(C) Ruther ford (D) I. Newton

60. In a hydrogen atom, the distance between the electron and proton is $2.5\times 10^{-11}\,m$. The electrical force of attraction between them will be
(A) $2.8\times 10^{-7}\,N$ (B) $3.7\times 10^{-7}\,N$
(C) $6.2\times 10^{-7}\,N$ (D) $9.1\times 10^{-7}\,N$

61. If $\lambda_{\max}$ is 6563 Å, then wave length of second line for Balmer series will be
(A) $\lambda = \frac{16}{3R}$ (B) $\lambda = \frac{36}{5R}$
(C) $\lambda = \frac{4}{3R}$ (D) None of the above

62. What will be the angular momentum of a electron, if energy of this electron in H-atom is $1.5eV$ (in J-sec)
(A) 1.05×10^{-34} (B) 2.1×10^{-34}
(C) 3.15×10^{-34} (D) -2.1×10^{-34}

63. Who discovered spin quantum number
(A) Unlenbeck and Goudsmit
(B) Nell's Bohr
(C) Zeeman
(D) Sommerfield

64. The time of revolution of an electron around a nucleus of charge Ze in n^{th} Bohr orbit is directly proportional to
(A) n (B) $\frac{n^3}{Z^2}$
(C) $\frac{n^2}{Z}$ (D) $\frac{Z}{n}$

65. In Bohr's model, if the atomic radius of the first orbit is r_0, then the radius of the fourth orbit is
(A) r_0 (B) $4r_0$
(C) $r_0/16$ (D) $16r_0$

66. If R is the Rydberg's constant for hydrogen the wave number of the first line in the Lyman series will be

(A) $\frac{R}{4}$ (B) $\frac{3R}{4}$

(C) $\frac{R}{2}$ (D) $2R$

67. In hydrogen atom, if the difference in the energy of the electron in $n=2$ and $n=3$ orbits is E, the ionization energy of hydrogen atom is

(A) 13.2 E (B) 7.2 E

(C) 5.6 E (D) 3.2 E

68. The first member of the Paschen series in hydrogen spectrum is of wavelength 18,800 $\mathring{A}$. The short wavelengths limit of Paschen series is

(A) 1215 $\mathring{A}$ (B) 6560 $\mathring{A}$

(C) 8225 $\mathring{A}$ (D) 12850 $\mathring{A}$

69. The ratio of the largest to shortest wavelengths in Lyman series of hydrogen spectra is

(A) $\frac{25}{9}$ (B) $\frac{17}{6}$

(C) $\frac{9}{5}$ (D) $\frac{4}{3}$

70. In Bohr model of hydrogen atom, the ratio of periods of revolution of an electron in $n=2$ and $n=1$ orbits is

(A) 2 : 1 (B) 4 : 1

(C) 8 : 1 (D) 16 : 1

71. Which of the following is true for number of spectral lines in going form Layman series to Pfund series

(A) Increases

(B) Decreases

(C) Unchanged

(D) May decreases or increases

72. The wavelength of yellow line of sodium is 5896 $\mathring{A}$. Its wave number will be

(A) 50883 × 10^{10} per *second*

(B) 16961 per *cm*

(C) 17581 per *cm*

(D) 50883 per *cm*

73. Radius of the first orbit of the electron in a hydrogen atom is 0.53 $\mathring{A}$. So, the radius of the third orbit will be

(A) 2.12 $\mathring{A}$ (B) 4.77 $\mathring{A}$

(C) 1.06 $\mathring{A}$ (D) 1.59 $\mathring{A}$

74. The first line in the Lyman series has wavelength λ. The wavelength of the first line in Balmer series is

(A) $\frac{2}{9}\lambda$ (B) $\frac{9}{2}\lambda$

(C) $\frac{5}{27}\lambda$ (D) $\frac{27}{5}\lambda$

75. In hydrogen atom which quantity is integral multiple of $\frac{h}{2\pi}$

(A) Angular momentum (B) Angular velocity

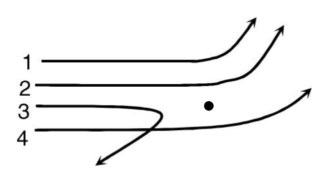
(C) Angular acceleration (D) Momentum

76. In the following transitions, which one has higher frequency

(A) 3 – 2 (B) 4 – 3

(C) 4 – 2 (D) 3 – 1

77. The diagram shows the path of four α-particles of the same energy being scattered by the nucleus of an atom simultaneously. Which of these are/is not physically possible



(A) 3 and 4 (B) 2 and 3

(C) 1 and 4 (D) 4 only

78. An electron jumps from 5th orbit to 4th orbit of hydrogen atom. Taking the Rydberg constant as 10^7 *per metre*. What will be the frequency of radiation emitted

(A) 6.75×10^{12} Hz (B) 6.75×10^{14} Hz

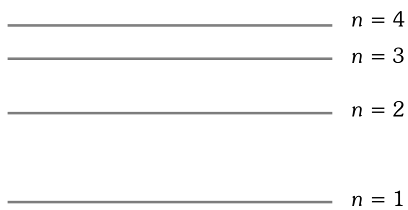
(C) 6.75×10^{13} Hz (D) None of these

79. For principal quantum number $n=3$, the possible values of orbital quantum number 'l' are

(A) 1, 2, 3 (B) 0, 1, 2, 3

(C) 0, 1, 2 (D) –1, 0, +1

80. Four lowest energy levels of H-atom are shown in the figure. The number of possible emission lines would be



(A) 3 (B) 4
(C) 5 (D) 6

81. The frequency of 1st line of Balmer series in H_2 atom is v_0. The frequency of line emitted by singly ionised He atom is
(A) $2v_0$ (B) $4v_0$
(C) $v_0/2$ (D) $v_0/4$

82. When the electron in the hydrogen atom jumps from 2nd orbit to 1st orbit, the wavelength of radiation emitted is λ. When the electrons jump from 3rd orbit to 1st orbit, the wavelength of emitted radiation would be
(A) $\frac{27}{32}\lambda$ (B) $\frac{32}{27}\lambda$
(C) $\frac{2}{3}\lambda$ (D) $\frac{3}{2}\lambda$

83. The possible quantum number for $3d$ electron are
(A) $n=3, l=1, m_l=+1, m_s=-\frac{1}{2}$
(B) $n=3, l=2, m_l=+2, m_s=-\frac{1}{2}$
(C) $n=3, l=1, m_l=-1, m_s=+\frac{1}{2}$
(D) $n=3, l=0, m_l=+1, m_s=-\frac{1}{2}$

84. The radius of the first (lowest) orbit of the hydrogen atom is a_0. The radius of the second (next higher) orbit will be
(A) $4a_0$ (B) $6a_0$
(C) $8a_0$ (D) $10a_0$

85. Which of the following transition will have highest emission wavelength
(A) $n=2$ to $n=1$ (B) $n=1$ to $n=2$
(C) $n=2$ to $n=5$ (D) $n=5$ to $n=2$

86. When the wave of hydrogen atom comes from infinity into the first orbit then the value of wave number is
(A) 109700 cm^{-1} (B) 1097cm^{-1}
(C) 109 cm^{-1} (D) None of these

87. With the increase in principle quantum number, the energy difference between the two successive energy levels
(A) Increases
(B) Decreases
(C) Remains constant
(D) Sometimes increases and sometimes decreases

88. In which of the following systems will the radius of the first orbit $(n=1)$ be minimum
(A) Single ionized helium
(B) Deuterium atom
(C) Hydrogen atom
(D) Doubly ionized lithium

89. If the binding energy of the electron in a hydrogen atom is 13.6 eV, the energy required to remove the electron from the first excited state of Li^{++} is
(A) 122.4 eV (B) 30.6 eV
(C) 13.6 eV (D) 3.4 eV

90. Which of the following is quantised according to Bohr's theory of hydrogen atom
(A) Linear momentum of electron
(B) Angular momentum of electron
(C) Linear velocity of electron
(D) Angular velocity of electron

91. In Bohr's model of hydrogen atom, which of the following pairs of quantities are quantized
(A) Energy and linear momentum
(B) Linear and angular momentum
(C) Energy and angular momentum
(D) None of the above

92. The energy of the highest energy photon of Balmer series of hydrogen spectrum is close to

(A) 13.6 eV (B) 3.4 eV

(C) 1.5 eV (D) 0.85 eV

93. Energy of an electron in n^{th} orbit of hydrogen atom is $\left(k = \frac{1}{4\pi\varepsilon_0}\right)$

(A) $-\frac{2\pi^2 k^2 me^4}{n^2 h^2}$ (B) $-\frac{4\pi^2\, m\, ke^2}{n^2 h^2}$

(C) $-\frac{n^2 h^2}{2\pi\, k\, me^4}$ (D) $-\frac{n^2 h^2}{4\pi^2\, k\, me^2}$

94. Which one of the relation is correct between time period and number of orbits while an electron is revolving in a orbit

(A) n^2 (B) $\frac{1}{n^2}$

(C) n^3 (D) $\frac{1}{n}$

95. An electron changes its position from orbit $n = 4$ to the orbit $n = 2$ of an atom. The wavelength of the emitted radiation's is (R = Rydberg's constant)

(A) $\frac{16}{R}$ (B) $\frac{16}{3R}$

(C) $\frac{16}{5R}$ (D) $\frac{16}{7R}$

96. If the energy of a hydrogen atom in nth orbit is E_n, then energy in the nth orbit of a singley ionized helium atom will be

(A) $4E_n$ (B) $E_n / 4$

(C) $2E_n$ (D) $E_n / 2$

97. What is the ratio of wavelength of radiations emitted when an electron in hydrogen atom jump from fourth orbit to second orbit and from third orbit to second orbit

(A) 27 : 25 (B) 20 : 27

(C) 20 : 25 (D) 25 : 27

98. The energy of electron in the nth orbit of hydrogen atom is expressed as $E_n = \frac{-13.6}{n^2} eV$. The shortest and longest wavelength of Lyman series will be

(A) 910 $Å$, 1213 $Å$ (B) 5463 $Å$, 7858 $Å$

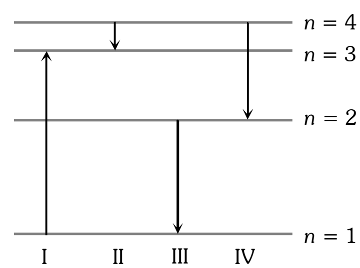
(C) 1315 $Å$, 1530 $Å$ (D) None of these

99. The ground state energy of hydrogen atom is – 13.6 eV. What is the potential energy of the electron in this state

(A) 0 eV (B) – 27.2 eV

(C) 1 eV (D) 2 eV

100. The diagram shows-the energy levels for an electron in a certain atom. Which transition shown represents the emission of a photon with the most energy



(A) I (B) II

(C) III (D) IV