NEET CHEMISTRY PRACITCE PAPER
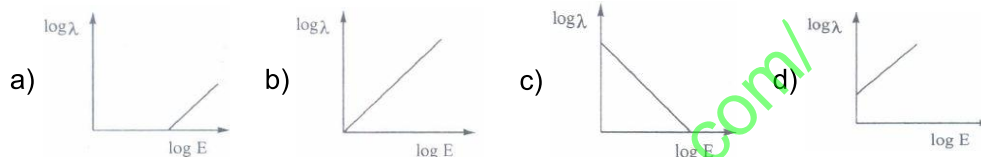
1. If the energy of H-atom in the ground state is -E, the velocity of photo-electron emitted when a photon having energy E_p strikes a stationary Li^{2+} ion in ground state, is given by:

   a) $v = \sqrt{\dfrac{2(E_p - E)}{m}}$ b) $v = \sqrt{\dfrac{2(E_p + 9E)}{m}}$ c) $v = \sqrt{\dfrac{2(E_p - 9E)}{m}}$ d) $v = \sqrt{\dfrac{2(E_p - 3E)}{m}}$

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

   a)   b)   c)   d)

3. 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

4. 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

5. Which of the following species is not stable?
   a) $[GeCl_6]^2$ b) $[Sn(OH)_6]2$ c) $[SiCl_6]^{2-}$ d) $[SiF_6]^2$

6. Assertion: According to de Broglie, the wavelengths associated with electrons and other subatomic particles can be detected experimentally.
   Reason: The wavelength associated with any material particle is directly proportional to its mass.
   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

7. 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

8. Which of the following explains the sequence of filling electrons in different subshells?
   a) Hund's rule   b) Aufbau principle   c) Pauli's principle   d) All of these

9. 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

10. In potassium the order of energy levels is
    a) 4s > 3d   b) 4s < 3d   c) 4s < 3p   d) 4s = 3d

11. Wavelength of an electron is $5 A^{\circ}$. Velocity of the electron is:
    a) 1.45 x 10^8 cm/s   b) 1.6 x 10^{-8} cm/s   c) 3.2 x 10^{-27} cm/s   d) 3.2 x 10^{27} cm/s

12. The kinetic energy of an electron in an orbit of hydrogen atom is 3.4ev/atom. Then identify the correctly matched set for that electron

List 1	List 2
A) Potential energy	1.09x 10^8 cm/sec
B) Total energy	2.116x 10^{-8} cm
C) Velocity	-6.8ev/atom
D) Its distance from nucleus	-3.4 ev/atom

The correct match is

a)	b)	c)	d)
A B C D	**A B C D**	**A B C D**	**A B C D**
4 3 2 1	2 1 4 3	3 4 1 2	3 4 2 1

13. The ratio of charge to mass of an electron in coulombs per gram was determined by J.J. Thomson. He determined this ratio by measuring the deflection of cathode rays in electric and magnetic fields. What value did he find for this ratio?

a) -1.76 x 10^8 coulombs/g   b) 1.76 x 10^{-8} coulombs/g   c) -1.76 x 10^{10} coulombs/g

d) -1.76 x 10^{-10} coulombs/g

14. 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)

15. The quantum numbers of four electrons (e_1 to e_4) are given below

	n	l	m	s
e_1	3	0	0	±1/2
e_2	4	0	0	1/2
e_3	3	2	2	-1/2
e_4	3	1	-1	1/2

The correct order of decreasing energy of these electrons is:

a) $e_4 > e_3 > e_2 > e_1$ b) $e_2 > e_3 > e_4 > e_1$ c) $e_3 > e_2 > e_4 > e_l$ d) $e_1 > e_3 > e_4 > e_2$

16. A 100 watt bulb emits monochromatic light of wavelength 400 nm. Calculate the number of photons emitted per second by the bulb.

a) 3 x 10^{20} s^{-1} b) 2 x 10^{-20} s^{-1} c) 2 x 10^{20} s^{-1} d) 1 x 10^{-20} s^{-1}

17. If $_b^a X$ emits firstly a positron, then two α and two β in the last α is emitted and finally it converts to $_d^c Y$. The correct relation is

a) a = c + 12, d = b - 5   b) a = c + 8, d = b - 1   c) a = c + c6, d = b - 2   d) a = c + 4, d = b - 2

18. How many orbitals in total are associated with 4th energy level?

a) 4   b) 9   c) 16   d) 7

19. 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

20. Based on equation $E = -2.178 \times 10^{-18} \left(\frac{Z^2}{n^2} \right)$ 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.

21. Table-tennis ball has a mass 10 g and a speed of 100 m/s. If speed can be measured within an accuracy of 10%, what will be the uncertainty in speed and position respectively?

    a) 10, 4 x 10^{-33} b) 10, 5.27 x 10^{-34} c) 0.1, 5 x 10^{-34} d) None of these

22. The radius of which of the following orbit is same as that of the first Bohr's orbit of hydrogen atom?

    a) He^+ (n = 2)   b) Li^{2+} (n = 2)   c) Li^{2+} (n = 3)   d) Be^{3+} (n = 2)

23. If an isotope of hydrogen has two neutrons in its atom, its atomic number and atomic mass respectively be

    a) 2 and 1   b) 1 and 1   c) 3 and 1   d) 1 and 3

24. The energy difference between the ground state of an atom and its excited state is 3 x 10^{-19} J. What is the wavelength of the photon required for this transition?

    a) 6.6 x 10^{-34} m   b) 3 x 10^{-8} m   c) 1.8 x 10^{-7} m   d) 6.6 x 10^{-7} m

25. The number of electrons which will together weigh one gram

    a) 1.098 x 10^{27} electrons   b) 9.1096 x 10^{31} electrons   c) 1 electron   d) 1 x 10^4 electrons

26. What is the electronic configuration of O^{2-} ion?

    a) $1s^2 2s^2 2p^6$ b) $1s^2 2s^2 2p^4$ c) $1s^2 2s^2 2p^5$ d) $1s^2 2s^2 2p^3$

27. 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

28. The ions $O^{2-}, F^-, Na^+, Mg^{2+}$ and Al^{3+} are isoelectronic. Their ionic radii show :

    a) A decrease from O^{2-} to F^- and then increase from Na^+ to Al^{3+} b) A significant increase from O^{2-} to Al^{3+}

    c) A significant decrease from O^{2-} to Al^{3+} d) An increase from O^{2-} to F and then decrease from Na^+ to Al^{3+}

29. 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

30. An element with mass number 81 contains 31.7% more neutrons as compared to protons. Assign the atomic symbol.

    a) $^{81}_{34}Br$ b) $^{81}_{35}Br$ c) $^{81}_{36}Sr$ d) $^{81}_{37}Sr$

31. Which of the following types of spectrum is best depicted by the given figure?
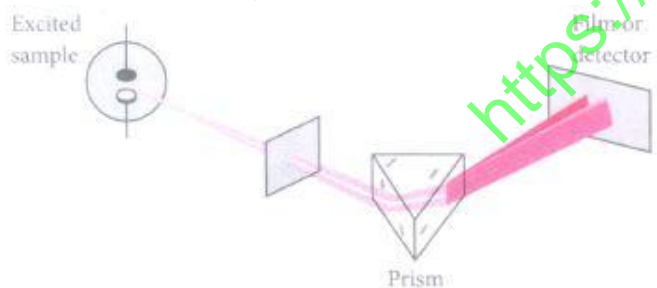
    a) Atomic absorption spectra   b) Atomic emission spectra   c) Continuous spectra   d) None of these

32. The radius of which of the following orbit is same as radius of pt orbit of H

    a) He^+(n=2)   b) Li^{2+}(n=2)   c) Li^{2+}(n=3)   d) Be^{3+}(n=2)

33. The number of neutrons in the dipositive zinc ion (Mass number or Zn = 65)

    a) 35   b) 33   c) 65   d) 67

34. The set of quantum numbers 'n' and 'l', possible for the orbital shown in the radial probability curve are
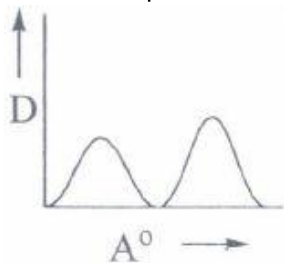
a) n=3;l=2   b) n = 4; l= 1   c) n = 2; l=0   d) n=3;l=3

35. In a radioactive decay, an emitted electron comes from
a) the nucleus of atom   b) the orbit with principal quantum number   c) the inner orbital of the atom
d) the outermost orbit of the atom

36. Splitting of spectral lines under the influence of magnetic field is called
a) Stark effect   b) Zeeman effect   c) photoelectric effect   d) screening effect

37. A 0.66 kg ball is moving with a speed of 100 m/s. The associated wavelength will be (h = 6.6 x 10^{-34} Js) :
a) 1.0 x 10^{-32}m   b) 6.6 x 10^{-32}m   c) 6.6 x 10^{-34}m   d) 1 x 10^{-35}m

38. 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

39. 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

40. The electronic configuration of an element with atomic number 29 is:
a) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^9, 4s^2$ b) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^{10}, 4s^1$
c) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^8, 4s^2, 3p^1$ d) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^7, 4s^2, 4p^2$

41. The schrodinger wave equation for hydrogen atom is Ψ(radial)$== \frac{1}{16\sqrt{4}} \left(\frac{z}{a_0} \right)^{3/2}$
$[(\sigma - 1)(\sigma^2 - 8\sigma + 12)] e^{-\sigma/2}$ 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) $\frac{a_0}{2Z}, \frac{4a_0}{Z}$

42. Total number of orbitals associated with third shell will be _____ .
a) 2   b) 4   c) 9   d) 3

43. 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}

44. The ratio of number of spectral lines obtained when an e⁻ jumps from 7th to ground to 6th to 3rd
a) 7   b) 3.5   c) 10   d) 2.5

45. When an electron makes a transition from (n+1) state to nth state, the frequency of emitted radiations is related to 'n' according to (n>>1):
a) $v = \frac{2CRZ^2}{n^3}$ b) $v = \frac{CRZ^2}{n^4}$ c) $v = \frac{CRZ^2}{n^2}$ d) $v = \frac{2CRZ^2}{n^2}$

46. Assertion: For l = 2, m, can be -2, -1,0, + 1 and +2.

Reason: For a given value of l, (2l + 1) values of m_1 are possible.

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

47. If n = 6, the correct sequence for filling of electrons will be:

a) $ns \to (n-1)f \to (n-1)d \to np$ b) $ns \to (n-1)f \to (n-2)d \to np$

c) $ns \to (n-2)f \to (n-1)d \to np$ d) $ns \to np(n-1)d \to (n-2)f$

48. 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

49. The energy absorbed by each molecule (A_2) of a substance is 4.4 x 10^{-19}J and bond energy per molecule is 4.0 x 10^{-19}J. The kinetic energy of the molecule per atom will be :

a) 2.0 x 10^{-20}J   b) 2.2 x 10^{-19}J   c) 2.0 x 10^{-19}J   d) 4.0 x 10^{-20}J

50. In the photoelectron emission, the energy of the emitted electron is

a) greater than the incident photon   b) same as that of the incident photon

c) smaller than the incident photon   d) proportional to the intensity of incident photon