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- 1) The nature of positive (canal) rays depends on
 - a) nature of electrode b) Nature of discharged tube
 - c) Nature of the residual gas d) All of mentioned
- 2) When 6d orbital is complete, the entering electron goes into:
 - a) 7f b) 6f c) 7d d) 7p
- 3) In the ground state of an atom, the electron is present in:
 - a) nucleus b) the 1st shell c) the 2nd shell
 - d) nearest possible shell to the nucleus
- 4) The wave number of the light emitted by a certain source is $2 \times 10^5 \text{ m}^{-1}$. Find its wavelength
 - a) 500nm b) 500m c) 500 μm d) $5 \times 10^7 \text{ m}$
- 5) Quantum number value for 2p subshell electrons are:
 - a) $n=1, l=1$ b) $n=2, l=1$ c) $n=2, l=0$ d) None
- 6) Orbitals having same energy are called as:
 - a) hybrid orbitals b) degenerate orbitals c) both d) None
- 7) The velocity of photon is:
 - a) independents of its wave length b) depends on its source
 - c) depend on wave length d) All
- 8) The negative charge on cathode rays was established by
 - a) Chadwick b) J. Perrin c) Goldstein d) J.J. Thomson
- 9) The mass of neutron is:
 - a) a little bit smaller than that of a proton b) same is that of a proton
 - c) slightly higher than a proton d) All
- 10) The relation between energy of a photon of light and its frequency was given by
 - a) De-Broglie in his dual nature of matter b) Bohr in his atomic model
 - c) plank in his quantum theory d) All
- 11) Line spectra are characteristics of the
 - a) atoms b) molecules c) Radical d) Ions
- 12) The energy levels for H-atoms in Bohr models are called as
 - a) orbitals b) Degenerate orbitals c) orbits d) None
- 13) Bohr's model treated an electron only as:
 - a) a particles b) a wave c) both d) None
- 14) Energy required to ionize the hydrogen is the energy difference between two orbits and these orbits are
 - a) 1st and 2nd b) 1st and 3rd c) 2nd and 3rd d) 1st and infinity
- 15) The wave length of Lyman series lies in
 - a) u.v region b) visible region c) I.R region d) Radio waves region
- 16) De Broglie's equation shows the relationship of the wave length associated with the moving electron and its
 - a) velocity only b) Mass only c) Momentum only d) None
- 17) If uncertainty in position of an electron is zero, the uncertainty in its momentum would be
 - a) zero b) one c) $h/2\pi$ d) infinite
- 18) All matter particles in motion have a dual character. This statement is given by:
 - a) Bohr b) Dalton c) Plank d) De-Broglie
- 19) The frequency of a spectral line in x-ray spectrum varies as square of atomic number of element emitting it, stated as:
 - a) Hund b) Debroglie c) Plank d) Moseley
- 20) Bohr's theory cannot explain the origin of spectrum for:
 - a) H b) He^{+1} c) Li^{+2} d) Li
- 21) The credit of discovering neutron goes to the:
 - a) Rutherford b) Goldstein c) Chadwick d) Austen
- 22) The maximum number of electrons in a sub shell for which $l=3$ is:
 - a) 10 b) 14 c) 6 d) 2
- 23) The number of electrons in the M shell of the element with atomic number 24 is
 - a) 24 b) 13 c) 12 d) 8
- 24) The symbol of the element whose atoms have the outermost electronic configuration $2\text{S}^2 2\text{P}^3$ is,
 - a) N b) Li c) P d) Na
- 25) The number of neutrons in the elements ^9Be is
 - a) 4 b) 5 c) 9 d) None
- 26) The electronic distribution of an atom/ion can be defined by the following
 - a) Aufbau principle b) Pauli's exclusion principle
 - c) Hund's rule d) All are used
- 27) Total number of possible values of $-m_l$ for $l=2$ are
 - a) 7 b) 5 c) 3 d) 1
- 28) Rutherford's experiment led to the discovery of:
 - a) Electron b) Proton c) Neutron d) Nucleus
- 29) Value of Azimuthal Quantum number of last electron in $_{11}\text{Na}$ is:
 - a) 1 b) 2 c) 3 d) 0
- 30) Which of the following orbitals have a dumb bell shape
 - a) s b) d c) p d) f
- 31) Which series of spectral lines do not lie in I.R region?
 - a) Balmer series b) Paschen series
 - c) Brackett series d) Pfund series
- 32) Hydrogen spectrum is an example of:
 - a) Atomic spectrum b) line spectrum c) Both d) none
- 33) Azimuthal quantum number basically tells about:
 - a) energy of electrons b) subshells in a shell
 - c) shapes of orbitals d) Both b & c
- 34) What is formula to calculate maximum number of electrons in a subshell (s,p,d,f)?
 - a) $2(l+1)$ b) $2(2l+1)$ c) $4(2l+2)$ d) All
- 35) Spin quantum number can only have possible values
 - a) 4 b) one c) two d) zero
- 36) Quantum number is also called orientation quantum number:
 - a) principle Q.No b) Magnetic Q.No c) Spin Q. No. d) None
- 37) The quantum number which describes energy level, shell number and distance of electron from the nucleus is:
 - a) Azimuthal Q.No b) Magnetic Q.No c) Principle Q. No. d) All
- 38) How many quantum numbers are required to completely describe electrons?
 - a) one b) two c) three d) four
- 39) Splitting of spectral lines into constituent lines under the influence of electric field is called as:
 - a) Zeeman effect b) double structure c) Stark effect d) All
- 40) Maximum No. of electrons in an orbit can be calculated by using the formula
 - a) $2(l+1)$ b) $2n^2$ c) $4+2n$ d) All
- 41) Line spectrum of Na has
 - a) 2 white lines b) 4 green lines
 - c) 2 yellow lines d) 7 series of lines
- 42) Rainbow is an example of
 - a) Atomic spectrum b) line spectrum
 - c) continuous spectrum d) None
- 43) The unit of frequency is
 - a) waves per second b) cycles per second c) hertz d) All of mentioned
- 44) mvr is equal to
 - a) nh/π b) $2nh/\pi$ c) $nh/2\pi$ d) $2nh\pi/4$
- 45) Value for Planck's constant (h) is
 - a) $6.62 \times 10^{-30} \text{ Js}$ b) $6.62 \times 10^{-34} \text{ Js}$ c) $6.02 \times 10^{-23} \text{ Js}$ d) $9.1 \times 10^{-31} \text{ Kgs}$
- 46) Cathode rays emitted from cathode are
 - a) Canal rays b) protons c) electrons d) positrons
- 47) Effect of magnetic field on cathode rays was studied by
 - a) J-Perrin b) J.J. Thomson c) Stoney d) Millikan
- 48) Electrons were discovered by
 - a) Goldstein b) James Chadwick c) William Crookes d) J.J. Thomson
- 49) The original glow disappears in glass discharge tube at pressure.
 - a) 0.1 torr b) 0.01 torr c) 0.001 torr d) 1 torr
- 50) 1 kg of electrons has coulomb's of charge
 - a) 1.7588×10^{11} b) 1.7588×10^{-11} c) 1.7588×10^{14} d) 1.7588×10^8
- 51) The e/m value for canal rays is found to be maximum for
 - a) H b) He c) Li d) O
- 52) Protons were discovered by

- (a) Goldstein (b) James Chadwick (c) William Crookes
(d) J.J. Thomson
- 53) Positive rays give flash on
(a) AgNO_3 plate (b) AgCl plate (c) ZnS plate (d) ZnO Plate
- 54) Lines of paschen series are produced when electrons jump from higher orbits to the orbit:
a) first b) second c) third d) fourth
- 55) Bright lines against a dark background is the characteristic of
a) Continuous spectrum b) Atomic absorption spectrum
c) Atomic emission spectrum d) Line spectrum
- 56) Which radiations are of high frequency than others?
a) X-Rays b) UV Radiations c) Cosmic Rays d) Gamma Radiations
- 57) Electrons should move... nearer to the nucleus of an atom.
a) Slower b) Faster c) Constantly d) 1st slow & than fast
- 58) Number of waves per unit length is called as
a) Frequency b) Wave number c) Wavelength d) Photons
- 59) Smallest charge of electricity which has been measured so far is present on
a) Electron b) Proton c) Neutron d) Anti-neutron
- 60) Which rays travel in a direction opposite to cathode rays ?
a) Cathode Rays b) Canal Rays c) Neutral Rays d) Negative rays
- 61) Cathode Rays possess certain value of momentum & showing that these are.....
a) Radiations b) Waves
c) Material Particles d) High frequency radiations
- 62) Second orbit of an atom is from the nucleus of an atoms than 1st.
a) 04times close b) 04times away c) 09times close d) 09times away
- 63) In which type of spectrum the boundary lines between the colors can not be marked?
a) Atomic spectrum b) Continuous spectrum c) Atomic absorption spectrum d) Atomic emission spectrum
- 64) Energy of revolving electron around a nucleus of an atom comprises...
a) K, E & P.E b) V.E & P.E c) P.E & Electrical Energy d) Kinetic & Electrical Energy
- 65) Gold foil used by Rutherford was of thickness
(a) 0.00004 m (b) 0.00004 cm (c) 0.00004 mm (d) 0.0000 nm
- 66) The tiny discrete units of light energy are called
(a) qunata (b) photons (c) wave length (d) frequency
- 67) Bohr explained the structure of hydrogen atom by using:
a) Rutherford's model b) Moseley's law c) Plank's quantum theory d) Discharge tubes
- 68) Nucleus of atom was discovered by
(a) j.j thomson (b) Rutherford (c) Max Planck's (d) Bohr
- 69) when alumina is placed in the path of cathode rays, then it glows
A) Yellow B) Orange C) Red D) Green
- 70) e/m value of cathode rays depends upon
A) Nature of gas B) Composition of glass
C) Nature of cathode D) None of these
- 71) when a free neutron decays then it produces
A) Proton B) Electron C) Neutrino D) All of these
- 72) fast neutrons mostly produce
A) Alpha particles B) Beta particles C) Gamma rays D) All of these
- 73) The wavelength of electron moving in the first orbit of H-atom is comparable to that of
a) gamma rays b) X-rays c) cosmic rays d) radio waves
- 74) The wavelength of alpha particle is times smaller than that of electron.
a) 1836 b) 7344 c) 1840 d) 4473
- 75) Uncertainty principle is applicable to
a) Large particles b) microscopic particles c) macroscopic particles d) none of these
- 76) when the value of azimuthal quantum number is 1, then shape of subshell is
a) spherical b) dumbbell c) complicated d) linear
- 77) Higher atomic number elements give x-rays of wave length.
a) shorter b) greater c) discrete d) none of these
- 78) Bohr's model atom is contradicted by:
(A) Planck quantum theory (B) Quantization of energy of electrons (C) Heisenberg's uncertainty principle (D) Quantization of angular momentum
- 79) When atoms are subjected to strong electric field, spelling of spectral lines is called:
(A) Zeeman effect (B) Stark effect
(C) Photoelectric effect (D) Compton effect
- 80) Number of bonds in N_2 molecules are:
(A) 1 (B) 2 (C) 3 (D) 4
- 81) An orbital which is spherical and symmetrical is:
(A) s-orbital (B) p-orbital (C) d-orbital (D) f-orbital
- 82) When 5d orbital is completed then entering electron goes into:
(A) 6s (B) 6p (C) 6d (D) 6f
- 83) What is the value of (n+l) for the 3rd sub-shell?
(A) 3 (B) 4 (C) 5 (D) 6
- 84) Matter is made up of extremely small particles called as:
a) Ions b) Electrons c) Atoms d) Molecules
- 85) Cathode rays & positive rays were discovered during:
a) Bombardment of alpha rays b) Bombardment of x-rays c) Discharge tube experiment d) Vacuum pump utility
- 86) Positive rays were found to contain:
a) Negatively charged particle b) Positively charged particles c) Protons & atoms d) Ions & molecules
- 87) Neutrons were discovered through:
a) Discharge tube experiment b) Bombardment of alpha rays on atoms of gold
b) c) Artificial radioactivity d) Rutherford's experiments
- 88) Which are the achievements of Rutherford's experiment?
a) Discovery of nucleus b) Presence of moving electrons around the nucleus c) Both 'a' & 'b' d) None
- 89) X-rays are produced when rapidly moving electrons collide with in discharge tube.
a) Heavy metal anode b) Heavy metal anti-cathode c) Both 'a' and 'b' d) Heavy metal cathode
- 90) Moseley discovered a simple relationship between:
a) Frequency of X-rays & mass number of target element
b) Frequency of X-rays & their energy
b) c) Frequency of X-rays & atomic number of target element d) None
- 91) Wave concept of an electron was given by:
a) Davisson & Germer b) de-Broglie c) Max Planck d) Bohr
- 92) Concept of principal quantum number came by:
a) Heisenberg b) Bohr c) Schrodinger d) Dirac
- 93) The radius of 3rd orbital of hydrogen atom is
a) 13.22°A b) 2.11°A c) 4.75 °A d) 0.52°A
- 94) The value of vacuum permittivity ϵ_0 is
a) 984 KJ mol⁻¹ b) 63⁻⁸ KJ mol⁻¹ c) 83.8 KJ mol⁻¹ d) none of these
- 95) Fast neutrons have energy
a) 1.2 Mev b) 1 Mev c) 3 Mev d) 5 Mev
- 96) Mass of electrons in amu is
a) 1.0073 b) 1.0087 c) 5.48 x 10⁻⁴ d) 9.1 x 10⁻³¹
- 97) Which orbital has spherical shape
a) s b) p c) d d) f
- 98) If l = 2, then total number of electrons accommodated will be
a) 2 b) 6 c) 14 d) 10
- 99) An orbital like s, px, py, pz etc. can have at the most
a) 03electrons b) 04electrons c) 01electron d) 02electrons
- 100) Two electrons in the same orbital should have opposite spins is according to
a) Pauli's Exclusion principle b) Aufbau Principle c) Hund's Rule d) Moseley's law
- 101) The probability for finding the electron is zero between two

- orbitals & this place is called as
a) Shielding effect b) Affinity place
c) Nodal plane d) Infinity point
- 102) For d-sub-shell there are.....of magnetic quantum number.
a) 03values b) 05values c) 01value only d) 04values
- 103) Electron in an orbital around the nucleus rotates about its own axis is called as
a) Clockwise rotation b) Anti-clockwise rotation
c) Self rotation d) Revolution
- 104) If value of $l = 2$ then it is called... in Azimuthal quantum number.
a) s-sub-shell b) p-sub shell c) d-sub shell d) f-sub shell
- 105) An electron can be described completely through its
a) 03quantum numbers b) 04quantum numbers c) 05quantum numbers d) 06quantum numbers
- 106) It is not possible for us to measure exact position & velocity of electron simultaneously is according to.....
a) Moseley's law b) Bohr's theory c) Plank's quantum theory d) Heisenberg's principle
- 107) All material particles in motion have a dual character is according to:
a) Louis de-Broglie b) Moseley c) Lord Rutherford d) Bohr
- 108) Frequency of a spectral line in X-ray spectrum varies as square of atomic number of an element emitting it is
a) Heisenberg's principle b) Moseley's law
c) Hund's rule d) Pauli's exclusion principle
- 109) The range of visible spectrum is
(a) 300- 600nm (b) 600--- 900 nm (c) 400 ---- 750nm (d) 100 300nm
- 110) Spectrum obtained due to incandescent light is
(a) Continuous Spectrum (b) Line Spectrum
(c) Atomic Spectrum (d) Both b and c
- 111) When the electron jumps from second, third, fourth orbit to the first orbit, the transitions are known as
a) (a) Balmer series (b) Lyman series
(c) Pfund series (d) Brackett series
- 112) When the electron jumps from fourth, fifth and sixth orbit to the 3rd orbit, the transitions are known as
(a) Balmer series (b) Paschen series
(c) Pfund series (d) Brackett series
- 113) The value of Rydberg's constant is
(a) $1.60022 \times 10^{-19} \text{ m}^{-1}$ (b) $9.1090 \times 10^{-31} \text{ m}^{-1}$
(c) $1.0974 \times 10^7 \text{ m}^{-1}$ (d) $1.0974 \times 10^{-5} \text{ m}^{-1}$
- 114) The limiting line of Balmer series lies in
(a) Visible region (b) UV region
(c) IR region (d) Far-IR region
- 115) The quantum number which describes the shape of the orbital is
a) Principle quantum number b) spin quantum number
c) Azimuthal quantum number d) magnetic quantum number
- 116) The value of Azimuthal number always starts from
(a) 0 (b) 1 (c) 2 (d) 3
- 117) Four d- orbitals contain four lobes while fifth contains only two lobes the orbital is
(a) d_{xy} (b) d_{xz} (c) d_{z^2} (d) $d_{x^2-y^2}$
- 118) when tin stone is placed in the path of cathode rays, then it glows
a) A) Yellow B) Orange C) Red D) Green
- 119) The nature of positive rays depends upon
A) Nature of electrode B) Nature of discharge tube
C) Nature of residual gas D) Nature of voltage
- 120) e/m value for positive rays is found to be maximum for;
a) Hydrogen b) Oxygen c) Helium d) Nitrogen
- 121) The number of unpaired electrons in an atom with $Z=24$ at the ground state will be
a) 4 b) 3 c) 5 d) 6
- 122) The ionization energy of the elements of the 5th group is greater than those of the 6th group. it is because
a) 5th group element has less electronegativity
b) 5th group element have half-filled atomic orbitals
c) 6th group of the elements has a greater shielding effect
d) 5th group of the elements has a greater shielding effect
- 123) What is not correct for the sub-shells?
a) They are of different shapes and energies
b) They are arranged in increasing order of increasing values of $(n+1)$
c) They are arranged in decreasing order of energy as we move away from the nucleus
d) They are represented by azimuthal quantum numbers always
- 124) When a neutron decays in a nucleus of an atom
a) Mass number decreases b) atomic number increases c) Atom gets a positive charge d) All above takes place
- 125) Total number of electrons present in all s orbitals, all p orbitals, & d orbitals of Cs ion are respectively;
a) 6, 26, 10 b) 10, 24, 20 c) 8, 22, 24 d) 12, 20, 28
- 126) The total number of d-electron present in an atom of atomic number 47 is
a) 10 b) 19 c) 16 d) 20
- 127) Which of the following statement is wholly correct?
a) Electrons of highest energy are those nearest to the nucleus
b) All the electrons in each valence shell are defined by the same principal quantum number
c) p_x, p_y, p_z orbitals defined by the same principal quantum number differ very slightly in energy
d) There is a reasonable chance of finding an electron in the nodal region
- 128) How many spherical nodes are present in a 4s orbital of a hydrogen atom?
a) 0 b) 4 c) 2 d) 3
- 129) The number of vacant orbitals in the valence of an atom of an element with $Z=14$ is
a) 1 b) 3 c) 5 d) 6
- 130) An atom with 8 electrons in its outer shell has a tendency
a) To gain electrons b) To neither loss nor gain electrons
c) To lose electrons d) Equal to square of its amplitude
- 131) The total number of the fundamental particles in one atom of C-14 is
a) 6 b) 8 c) 14 d) 20
- 132) The d-orbital with the orientation along the x and y axes is called
a) d_{xy} b) dy^2 c) dx^2 d) dx^2y^2
- 133) An atom, with atomic number 14, has a total of
a) 8 p-orbital b) 4 p-orbital c) 6 p-orbital d) 10 p-orbital
- 134) Which of the following orbitals are degenerate in multi-electron atoms?
a) 3d orbitals b) 1s, 2s orbitals c) 3s, 3p, 3d orbitals d) 2d orbitals
- 135) The arrangement of sodium, oxygen, fluorine, and strontium on the basis of increasing first ionization energy
a) Na < Sr < O < F b) Sr < Na < O < F
c) Sr < Na < F < O d) Na < Sr < F < O
- 136) Atomic number of an element 'M' is 26. How many electrons are present in M-shell in ground state?
a) 11 b) 15 c) 14 d) 16
- 137) Angular momentum of an electron present in excited state of Hydrogen is $1.5 h/\pi$. Electron present in its ground state?
a) 3rd orbit b) 2nd orbit c) 4th orbit d) 5th orbit
- 138) Which of the following electronic arrangements of the outermost orbit denotes a halogen?
a) $4s^2 4p^5$ b) $3s^2 3p^6$ c) $5s^2 5p^6$ d) none of these
- 139) Which of the following elements has the least number of electrons in its M shell?
a) Sc b) Mn c) Ni d) K

- 140) The very middle region in between two atomic orbitals is
 a) Called nodal region and has a maximum electron density
 b) Called nodal region and has a small electron density
 c) Called nodal region and has 0 electron density d) Not called nodal region and has a little electron density
- 141) Electronic arrangement of a trivalent anion is 2, 8, 8. The atomic number of the element forming this anion is
 a) 2 b) 15 c) 18 d) 19
- 142) What is true for the arrangement of the following sub-shells in an atom?
 a) 7s>6p>5d>4f b) 4f>7s>5d>6p c) 4f>5d>6p>7s d) 5d>6p>4f>7s
- 143) Screening by core electrons in atoms is_
 a) More efficient than that by valence electrons b) Responsible for decrease in atomic radius going down a group
 b) c) Essentially identical to that by valence electrons d) less efficient than that by valence electrons
- 144) Which of the following sets contains species that are isoelectronic?
 a) Cl, Ar, K b) F⁻, Ne, Na⁺ c) Al³⁺, S²⁻, Ar d) P³⁻, S²⁻, Ar
- 145) The electrons in the 3rd orbit of an atom have _energy than the electrons in the 2nd orbit
 a) More b) The same c) Less d) none of these
- 146) An atom has atomic weight of W and atomic number N then;
 a) Number of electron = W - N b) Number of proton = W - N
 c) Number of neutron = W - N d) Number of neutron = N
- 147) Which of the following element outermost orbit's last electron has magnetic quantum no. m=0?
 a) Na b) O c) Cl d) N
- 148) All the orbitals in a given electron shell (energy level) have the same value of the _quantum number?
 a) Spin b) Azimuthal c) Principle d) Magnetic
- 149) There are _possible values for the magnetic quantum number of an electron in a 5f subshell
 a) 7 b) 14 c) 3 d) 5
- 150) No two electrons in same atom can have an identical set of four quantum numbers. This statement is called
 a) Hund's rule b) Pauli's Exclusion principle
 c) Aufbau rule d) (n+1) rule
- 151) Neutron is a fundamental particle that carries?
 a) No charge & mass of one unit b) No charge & no mass
 c) charge of +1 & mass of 1 unit d) charge 1 unit & no mass
- 152) Principle Quantum number describes?
 a) Size of orbital b) Shape of orbital
 c) Orientation of an orbital d) Spin of orbital
- 153) An element has 18 electrons and 20 neutrons. Its charge is +2. What is its mass number?
 a) 39 b) 40 c) 32 d) 38
- 154) Cathode rays are deflected by?
 a) Both electric & magnetic field b) electric field only c) Neither electric nor magnetic field d) magnetic field only
- 155) Which of the following statement is wrong about electrons?
 a) wave-like property b) a particle c) emits energy while moving in orbit d) motion is affected by magnetic field
- 156) The heaviest particle among all four given particles is?
 a) Proton b) Meson c) Electron d) Neutron
- 157) The shape of an orbital is governed by?
 a) Principle quantum number b) Spin quantum number
 c) Azimuthal quantum number d) Magnetic quantum number
- 158) When the azimuthal quantum number l is 3 then _m' can have?
 a) 5 values b) 1 value c) 7 values d) 3 value
- 159) Particle that most affects material properties
 a) Electrons b) Protons c) Neutrons d) Valence electrons
- 160) The value of a magnetic quantum number of the last electron Na is?
 a) 2 b) -1 c) 0 d) 3
- 161) A proton has approximately the same mass as
 a) An electron b) An alpha particle c) A beta particle d) neutron
- 162) The absolute charge of an electron is _?
 a) $-1.6 \times 10^{-19} \text{ C}$ b) $+1.6 \times 10^{-19} \text{ C}$ c) $1.6 \times 10^{-19} \text{ C}$ d) -1
- 163) Which one of the following sets of the quantum numbers (n, l, m, s) represents an impossible arrangement?
 a) 3, 2, -3, $\frac{1}{2}$ b) 3, 2, -2, $\frac{1}{2}$ c) 4, 0, 0, $\frac{1}{2}$ d) 5, 3, 0, $\frac{1}{2}$
- 164) Compared to the charge and mass of a proton, an electron has...
 a) The same charge and the same mass b) An opposite charge and the same mass
 c) An opposite charge and a similar mass d) The same charge and the smaller mass
- 165) Isotopes are:
 a) Chemically similar b) Physically dissimilar c) Chemically dissimilar d) Both a and b
- 166) The electronic configuration of an element is $1s^2 2s^2 2p^3$. This represents a/an:
 a) Ground state b) Hybridized state
 c) Excited-state d) Molecular state
- 167) In which of the following, all have the same number of electrons:
 a) Cl⁻, Br⁻ and I⁻ b) H⁻, H and H⁺
 c) F⁻, Ne and Na⁺ d) Li⁺, Na⁺ and K⁺
- 168) Identify the correct order of increasing energy:
 a) 1s < 2s < 3s b) 2s > 3s > 1s c) 1s > 2s > 3s d) None of the above
- 169) The shapes of s orbitals is circular and their size:
 a) Increase with the increase in principal quantum number
 b) Decrease with the increase in principal quantum number
 c) Remains the same with the change in principal quantum number
 d) None of the above
- 170) The place between the two orbitals is called:
 a) Free zone b) Nodal surface c) Neutral zone d) Resonance area
- 171) Shapes of p orbitals:
 a) Circular b) Dumb-bell c) Elliptical d) Complex
- 172) The ion that is iso-electronic with C⁻ atom is:
 a) CN⁻ b) O²⁻ c) N²⁻ d) O²⁻
- 173) Which of the following particles would on losing an electron has its outermost p-orbital as half-filled?
 a) Nitrogen atom b) O⁺ ion c) P⁺ ion d) S⁺ ion
- 174) The ionic specie having more electrons than neutrons is:
 a) Mg²⁺ b) O²⁻ c) Na⁺ d) F⁻
- 175) Which pair of elements of elements will have the same chemical properties?
 a) 2, 24 b) 2, 4 c) 13, 22 d) 3, 11
- 176) An orbital which is spherically symmetrical is:
 a) p-orbital b) s-orbital c) d-orbital d) f-orbital
- 177) The value of e/m for the electron is:
 a) $1.7588 \times 10^{11} \text{ kg C}^{-1}$ b) $1.7588 \times 10^{-11} \text{ Ckg}^{-1}$
 c) $1.7588 \times 10^{11} \text{ kg C}^{-1}$ d) $1.7588 \times 10^{11} \text{ Ckg}^{-1}$
- 178) A nodal plane in an orbital is the plane where the electron density is:
 a) Maximum b) -ve c) Zero d) +ve
- 179) How many times the mass of neutrons is greater than the mass of an electron?
 a) 1480 b) 2000 c) 1840 d) 1200
- 180) The mass of an oxygen atom is:
 a) $2.657 \times 10^{-23} \text{ g}$ b) $2.657 \times 10^{23} \text{ g}$ c) 16g d) 32g
- 181) The mass of a neutron is:
 a) equal to proton b) A little bit smaller than proton
 c) Slightly more than proton d) Slightly less than proton
- 182) The smallest charge of electricity which has been measured on any particle is:
 a) Charge on positive ray of He b) Charge on particles
 c) Charge on droplet in Millikan Experiment d) Charge on electron
- 183) Which of the following has highest ionization energy value?
 a) Li b) Be c) H d) He
- 184) The mass of a proton is:
 a) $9.1 \times 10^{-10} \text{ g}$ b) $9.1 \times 10^{-18} \text{ g}$ c) $1.672 \times 10^{-27} \text{ kg}$ d) $9.1 \times 10^{-31} \text{ kg}$