

NATIONWIDE EDUCATION AND SCHOLARSHIP TEST

(N.E.S.T.)

SAMPLE QUESTIONS

Important: Please note that the questions given in this Sample Question Paper are for example only. The number and distribution of questions in each section of the actual paper will be as advertised in our publicity material in the relevant section of this website and posters sent to your college this year.

Section-I

PHYSICS & CHEMISTRY

- An electron moving in an electromagnetic field moves –
(a) In a straight path
(b) Along the same plane in the direction of its propagation
(c) Opposite to the original direction of propagation
(d) In a sine wave
- The total work done on the particle is equal to the change in its kinetic energy
(a) Always
(b) Only if the forces acting on the body are conservative.
(c) Only if the forces acting on the body are gravitational.
(d) Only if the forces acting on the body are elastic.
- The following unit measure energy:
(a) Kilo-watt hour.
(b) Volt*volt/sec*ohm.
(c) Pascal*foot*foot
(d) (Coulomb*coulomb)*farad
- Astronauts in stable orbits around the earth are in a state of weightlessness because
(a) There is no gravitational force acting on them.
(b) The satellite and the air inside it have acceleration equal to that of gravitational acceleration there.
(c) The gravitational force of the earth and the sun balance giving null resultant.
(d) There is no atmosphere at the height at which the satellites move.
- An organ pipe, open at both ends and another organ pipe closed at one end, will resonate with each other, if their lengths are in the ratio of
(a) 1:1 (b) 1:4 (c) 2:1 (d) 1:2
- During an isothermal expansion of an ideal gas
(a) Its internal energy increases.
(b) Its internal energy decreases.
(c) Its internal energy does not change.
(d) The work done by the gas is not equal to the quantity of heat absorbed by it.
- A parallel plate capacitor is charged and the charging battery is then disconnected. If the plates of the capacitor are moved further apart by means of insulating handles
(a) The charge on the capacitor increases.
(b) The voltage across the plates increases.
(c) The capacitance increases.
(d) The electrostatic energy stored in the capacitor decreases.
- Two equal negative charges q are fixed at point (0,a) and (0,-a) on the y-axis. A positive charge Q is released from rest at the point (2a,0) on the x-axis. The charge Q will
(a) Execute simple harmonic motion about the origin
(b) Move to the origin and remain at rest
(c) Move to infinity
(d) Execute oscillatory but not simple harmonic motion
- A square conducting loop of length L on a side carries a current I. The magnetic field at the centre of the loop is
(a) Independant of L
(b) Proportional to L*L
(c) Inversely proportional to L
(d) Directly proportional to L
- The focal length of a convex lens when placed in air and then in water will
(a) Increase in water with respect to air
(b) Increase in air with respect to water
(c) Decrease in water with respect to air
(d) Remain the same
- The maximum kinetic energy of the photoelectron emitted from the surface is dependant on
(a) The intensity of incident radiation
(b) The potential of the collector electrode
(c) The frequency of incident radiation
(d) The angle of incidence of radiation of the surface
- An electron orbiting in a circular orbit around the nucleus of the atom
(a) Has a magnetic dipole moment
(b) Exerts an electric force on the nucleus equal to that on it by the nucleus
(c) Does not produce a magnetic induction at the nucleus
(d) All of the above
- The X-rays beam coming from an X-ray tube will be:
(a) Monochromatic
(b) Having all wavelengths smaller than a certain minimum wavelength
(c) Having all wavelengths larger than a certain minimum wavelength
(d) Having all wavelengths lying between a minimum and a maximum wavelength
- The mass number of a nucleus is
(a) Always less than its atomic number
(b) Always more than its atomic number
(c) Always equal to its atomic number
(d) Sometimes more and sometimes equal to its atomic number
- Two successive elements belonging to the first transition series have the same number of electrons partially filling orbitals. They are
(a) V and Cr (b) Ti and V (c) Mn and Cr (d) Fe and Co
- When $n+l$ has the same value for two or more orbitals, the new electron enters the orbital where
(a) n is maximum (b) n is minimum (c) l is maximum (d) l is minimum
- A balloon filled with ethylene is pricked with a sharp pointed needle and quickly placed in a tank full of hydrogen at the same pressure. After a while the balloon would have
(a) Shrunk
(b) Enlarged
(c) Completely collapsed
(d) Remain unchanged in size
- Which of the following statements is not true?
(a) The ratio of the mean speed to the rms speed is independant of temperature
(b) The square of the mean speed of the molecules is equal to the mean squared speed at a certain temperature
(c) Mean kinetic energy of the gas molecules at any given temperature is independant of the mean speed
(d) None
- Which of the following statements represent Raoult's Law?
(a) Mole fraction of solvent = ratio of vapour pressure of the solution to vapour pressure of the solvent
(b) Mole fraction of solute = ratio of vapour pressure of the solution to vapour pressure of the solvent
(c) Mole fraction of solute = lowering of vapour pressure of the solution
(d) Mole fraction of solvent = lowering of vapour pressure of the solution
- Elements having the same atomic number and the same atomic mass are known as
(a) Isotopes
(b) Isotones
(c) Isomers
(d) None of the above
- Which is the most acidic amongst
(a) Nitrophenol
(b) O-toulene
(c) Phenol
(d) Cresol
- Pure water does not conduct electricity because it is
(a) Almost not ionised
(b) Low boiling
(c) Neutral
(d) Readily decomposed
- In a salt bridge, KCl is used because
(a) It is an electrolyte
(b) The transference number of K^+ and Cl^- is nearly the same
(c) It is a good conductor of electricity
(d) All of the above
- A depolarizer used in the dry cell batteries is
(a) KCl (b) MnO_2 (c) KOH (d) None of the above
- The hydrolysis of alkyl halides by aqueous NaOH is best termed as
(a) Electrophilic substitution reaction
(b) Electrophilic addition reaction
(c) Nucleophilic addition reaction
(d) Nucleophilic substitution reaction
- The hydrocarbon that gives a red precipitate with ammoniacal cuprous chloride is (where ' \square ' means a triple bond)
(a) $CH_3-CH_2-CH_2-CH_3$
(b) $CH_3-C\square C-CH_3$
(c) $CH_2=CH-CH=CH_2$
(d) $CH_3-CH_2-C\square CH$
- Which of the following reagents is neither neutral nor basic
(a) Lucas' reagent
(b) Tollen's reagent
(c) Bayer's reagent
(d) Fehling's solution
- The substance which is most easily nitrated
(a) Toluene
(b) Benzene
(c) Nitrobenzene
(d) Chlorobenzene
- Carbylamine reaction is a test for
(a) Primary amine
(b) Secondary amine
(c) Tertiary amine
(d) Quarternary ammonium salt
- Which of the following oxides cannot be reduced by carbon to obtain metal
(a) ZnO
(b) Al_2O_3
(c) Fe_2O_3
(d) PbO
- Which of the following is not an oxide ore?
(a) Cassiterite
(b) Siderite
(c) Pyrolusite
(d) Bauxite
- Which among the following is called philosopher's wool
(a) Cellulose
(b) Calamine
(c) Stellite
(d) Cerussite
- When a bicycle is in motion, the force of friction exerted by the ground on the two wheels is such that it acts
(a) In the backward direction on the front wheel and in the forward direction on the rear wheel.
(b) In the forward direction on the front wheel and in the backward direction on the rear wheel.
(c) In the backward direction on both the front and rear wheels.
(d) None of the above.
- A certain radioactive element A, has a half life = t seconds. In (t/2) seconds the fraction of the initial quantity of the element so far decayed is nearly
(a) 29%
(b) 15%
(c) 10%
(d) 45%
- Which of the following plots would be a straight line ?
(a) Logarithm of decay rate against logarithm of time
(b) Logarithm of decay rate against logarithm of number of decaying nuclei
(c) Decay rate against time
(d) Number of decaying nuclei against time
- A radioactive element x has an atomic number of 100. It decays directly into an element y which decays directly into element z. In both processes a charged particle is emitted. Which of the following statements would be true?
(a) y has an atomic number of 102
(b) y has an atomic number of 101
(c) z has an atomic number of 100
(d) z has an atomic number of 101
- If the sum of the roots of the equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals then a/c, b/a, c/b are in
(a) AP
(b) GP
(c) HP
(d) None of these
- A man speaks the truth 3 out of 4 times. He throws a die and reports it to be a 6. What is the probability of it being a 6?
(a) 3/8
(b) 5/8
(c) 3/4
(d) None of the above
- If $\cos^2 A + \cos^2 B + \cos^2 C = 1$ then ABC is a
(a) Right angle triangle
(b) Equilateral triangle
(c) All the angles are acute
(d) None of these
- Image of point (3,8) in the line $x + 3y = 7$ is
(a) (-1,-4)
(b) (-1,4)
(c) (2,-4)
(d) (-2,-4)
- The mass number of a nucleus is
(a) Always less than its atomic number
(b) Always more than its atomic number
(c) Sometimes more than and sometimes equal to its atomic number
(d) None of the above
- The maximum KE of the photoelectron emitted from a surface is dependent on
(a) The intensity of incident radiation
(b) The potential of the collector electrode
(c) The frequency of incident radiation
(d) The angle of incidence of radiation of the surface
- Which of the following is not an essential condition for interference
(a) The two interfering waves must be propagated in almost the same direction or the two interfering waves must intersect at a very small angle
(b) The waves must have the same time period and wavelength
(c) Amplitude of the two waves should be the same
(d) The interfering beams of light must originate from the same source
- When X-Ray photons collide with electrons
(a) They slow down
(b) Their mass increases
(c) Their wave length increases
(d) Their energy decreases
- An electron emits energy
(a) Because its in orbit
(b) When it jumps from one energy level to another
(c) Electrons are attracted towards the nucleus
(d) The electrostatic force is insufficient to hold the electrons in orbits