TEST-1 SEMICONDUCTOR PHYSICS AND DIODES(ELECTRONICS)

Q.1 Nucleus is made of
a) electrons and protons
‘ b) photons and neutrons
c) photons and neutrons
d) photons and electrons

Q.2 Atom of any element
a) positively charged
b) negatively charged
c) positively or negatively charged
d) not charged

Q.3 Conduction of electricity through conductor takes place by
a) protons
b) neutrons
c) bound electrons
d) free electrons

Q.4 Intrinsic semiconductor at room-temperature will have,…… available for conduction.
a) electrons
b) holes
c) both electrons and holes
d) none of the above

Q.5 Intrinsic semiconductor at d^{0}’K will have ……..available for conduction.
a) electrons
b) holes
c) both electrons and holes
d) nothins

Q.6 At room temperature N- type material will have……..
a) more of electrons
b) more of electrons
c) equal number of electrons and holes

Q.7 At room temperature P-type material will have……..
a) more of electrons
b) more of electrons
c) equal number of electrons and holes

Q.8 It is easy to break the covalent bond by thermal energy in case of……..
a) carbon b) germanium
c) silicon

Q.9 One eV of energy is equivalent to
a) 2.0 ers
b) 1.0×10^{-19} joule
c) 0.16×10^{-19} joule
d) 3.14×10^{-19} joule

Q.10 Which of the following statements is incorrect regarding valence band in a solid?
a) It may be empty in some solids
b) It is the highest occupied band
c) It is either completely filled or partially filled
d) It represents the energy possessed by its valance electrons

Q.11 Which of the following statements is incorrect regarding conduction band?
a) It lies below the valence band
b) It may be either empty or partially filled
c) It is lowest unfilled energy band
d) It represents the energy of conduction electrons.

Q.12 The neighboring atoms in the crystalline lattice structure of a semiconductor like germanium form……. Bonds.
a) molecular b) ionic
c) covalent d) metallic

Q.13 The forbidden band in germanium at 0^0 K is
a) 0.03 eV b) 0.785eV
c) 1.5 eV d) 2.0 eV

Q.14 Donor type semi-conductor is formed by adding impurity of…….. valence.
a) 2 b) 3
c) 4 d) 5

Q.15 Fermi level represents the energy level with probability of its occupation of
a) zero b) 25 percent
c) 50 percent d) 100 percent

Q.16 Intrinsic semiconductors are those
a) which are made of semiconductor material in its purest form
b) which have zero energy gap
c) which have more electrons than holes
d) which are available locally

Q.17 The diffusion current is proportional to
a) applied electric field
b) square of applied electric field
c) concentration gradient of charge carrier
d) a constant value given by Fermi level

Q.18 The depletion region of a P-N junction is one that is depleted of
a) immobile charges
b) mobile charges
c) atoms

Q.19 Consider the energy level diagram of an intrinsic semiconductor. The Fermi level lies in the
a) valence band
b) forbidden gap
c) conduction band or
d) it can be at any of the above locations depending upon the doping concentratopm and temperature.

Q.20 In any specimen the Hall voltage is proportional to magnetic field B as
a) β b) β^2
c) 1/ β d) $1/\beta^2$

Q.21 Intrinsic concentration of charge carriers in a semiconductor varies as
a) T^3 b) T^2
c) T d) 1/T

Q.22 The dynamic resistance of a diode varies as
a) I the current b) I^2
c) 1/I d) $1/1^2$

Q.23 At higher forward voltages, a junctions diode is likely to…..
a) become noisy
b) burn out
c) get saturated
d) suffer breakdown

Q.24 For converting intrinsic semiconductors into extrinsic ones, the level of doping required is about……
a) 1 ; 10^2 b) 1 : 10^4
c) 1 : 10^8 d) 1 : 10^{16}

Q.25 A pure semiconductor behaves like an insulator at 00 K because
a) there is no recombination of electrons with holes
b) drift velocity of free electrons is very small
c) free electrons are not available for current conduction
d) energy possessed by electrons at that low temperature is almost zero

Q.26 ……. Is used to describe the static V/I characteristic of a junction diode
a) Bolzmann diode equation
b) Richardson-Dushman equation
c) Child's Three half-power law
d) Einstein's photoelectric equation

Q.27 The energy gap is much more in silicon than in germanium because
a) it has less number of electrons
b) it has high atomic mass number
c) its crystal has much stronger bonds called ionic bonds
d) its valence electrons. Are more tightly bound to their parent nuclii

Q.28 Which of the following statements is incorrect?
a) No electrons can occupy states in the forbidden gap
b) The forbidden band in silicon at 00K is 1.21 eV
c) Doping of a semiconductor results in creation of new energy band
d) Doping of semiconductor results in creation of new energy level in forbidden band

Q.29 Geranium atom contains
a) four neutrons
b) two protons
c) four electrons
d) two electron orbits

Q.30 Which of the following is a semiconductor?
a) Diamond
b) Arsenic
c) Phosphorous
d) Gallium arsenide

Q.31 Which of the following elements belong to the same group of periodic tables as that of silicon and germanium?
a) Phosphorous b) Carbon
c) Sodium d) Boron

Q.32 In a atom the outermost orbit cannot have
a) less that four electrons
b) more than eight electrons
c) electrons of other atoms
d) all of the above

Q.33 When n is the number of the shell, the maximum number of electrons in the shell can be
a) n^4 b) $2n^3$
c) $2n^2$ d) 2n

Q.34 A semiconductor has……. Temperature co-efficient of resistance
a) zero b) positive
c) negative

Q.35 The atomic number of germanium is
a) 4 b) 8
c) 16 d) 32

Q.36 An electron will not contribute to electric current when
a) it is in a completely filled band
b) it strikes a positive ion
c) it loses its charge
d) it is at higher temperatures

Q.37 A semiconductor in its purest form is called.
a) insulator
b) superconductor
c) superconductor
d) extrinsic semiconductor

Q.38 The process of deliberately adding impurities to a semiconductor is known as….
a) drifting b) doping
c) sintering d) intrusion

Q.39 The temperature co-efficient of an intrinsic semiconductor is
a) zero b) positive
c) negative

Q.40 The temperature co-efficient of an extrinsic semiconductor is
a) zero
b) positive
c) negative
d) none of the above

Q.41 As the temperature co-efficient of an intrinsic semiconductor is in crease
a) energy of the atoms is increased
b) more holes are created in the conduction band
c) holes and free electrons get fused together
d) none of these

Q.42 The conduction band
a) is always above the forbidden energy level
b) is the region of free electrons
c) concentrates holes for the flow of current
d) is a range of energies corresponding to the energies of the free electrons

Q.43 An electron in the conduction band
a) is always charge less
b) has tendency to leave the atom
c) has lower energy than an electron in the valence band
d) has higher energy' than an electron in the valence band

Q.44 An intrinsic semiconductor at absolute zero
a) becomes extrinsic semiconductor
b) behaves like an insulator
c) disintegrates into pieces
d) becomes superconductor

Q.45 When an electron breaks a covalent bond and moves away
a) a vacancy is created in the broken covalent bond
b) more ions are produced
c) the semiconductor becomes conductor
d) the conductivity of the material increases

Q.46 A doped semiconductor is also known as
a) intrinsic semiconductor
b) extrinsic semiconductor
c) diffused semiconductor
d) none of the above

Q.47 A P-type semiconductor results when
a) a pent valet impurity is added to an intrinsic semiconductor
b) a trivalent impurity is added to an intrinsic semiconductor
c) either a pentavalent or trivalent impurity is added to an intrinsic semiconductor
d) none of the above

Q.48 The movement of a hole results from
a) excitation due to high temperature
b) change in number of protons in the atom
c) the vacancy filled by valence electron from the neighboring atom
d) none of these

Q.49 ……. Has the highest mobility.
a) Electron b) Positive ions
b) Negative ions d) Neutron
c)

Q.50 The donor impurity must have only…… valence electrons.
a) tow b) three
c) four d) five