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Electromagnetic Waves And Electronics

Chapter No.16 (MCQs)

1. Electromagnetic waves are produced by:
   a) Stationary waves.
   b) Electrons moving with uniform speed.
   c) Electrons moving with uniform velocity.
   d) Accelerated electrons.

2. Each electromagnetic wave is composed of:
   a) Electric and magnetic fields vibrating parallel to each other.
   b) Electric and magnetic fields vibrating perpendicular to each other.
   c) Stationary electric and magnetic fields.
   d) None of these.

3. An electromagnetic wave travels in a direction:
   a) Parallel to electric as well as magnetic field vectors.
   b) Perpendicular to electric as well as magnetic field vectors.
   c) Parallel to electric but perpendicular to magnetic field vectors.
   d) Perpendicular to electric but parallel to magnetic field vectors.

4. Speed of an electromagnetic wave in a medium depends upon:
   a) Electric as well as magnetic properties of the medium.
   b) Electric properties but is independent of magnetic properties.
   c) Magnetic properties but is independent of electric properties.
   d) None of these.

5. If ε_o is the permeability and μ_o is the permeability of free space, then the speed of an electromagnetic wave in vacuum is given by:
   a) $C = 1/\varepsilon_o \mu_o$.
   b) $C = \varepsilon_o \mu_o$.
   c) $C = \sqrt{\varepsilon_o} \mu_o$.
   d) $c = 1/\sqrt{\varepsilon_o} \mu_o$.

6. Speed of radio waves in vacuum is:
   a) 3×10^6 m/s.
   b) 3×10^8 m/s.
   c) 3×10^8 ft/s.
   d) 3×10^{10} m/s.

7. Substances whose electrical resistivity lies between those of conductors and insulators are called:
   a) Supper conductor.
   b) Semi conductors.
   c) P-type conductors.
   d) N-type conductors.

8. In semi conductors charge carriers (i.e. charged particles respo9nsible for the flow of current) are:
   a) Free electrons.
   b) Holes.
   c) Electrons and holes.
   d) Protons.

9. Silicon and Germanium atoms are:
   a) Divalent.
   b) Trivalent.
   c) Tetravalent.
   d) Pentavalent.

10. In the purest form silicon and Germanium are:
   a) Conductors.
   b) Insulators.
   c) Semi conductors.
   d) Supper conductors.

11. The process of adding a suitable impurity in Germaniums or Silicon crystal to improve its electrical conductivity is called:

a) Purification.
b) Adulteration.
c) Doping.

12. When a Germaniums crystal is doped with a trivalent impurity such as indium or gallium, the semiconductor thus obtained is of:

a) P-type.
b) N-type.
c) Supper conductor.
d) None of the above.

13. When a Germanium crystal is doped with a pentavalent impurity such as arsenic, the semiconductor thus obtained is of:

a) Supper conductor.
b) P-type.
c) N-type.
d) None of the above.

14. In p-type semi conductor, current is due the flow of:

a) Electrons.
b) Protons.
c) Electrons and holes.
d) Holes.

15. in n-type semi conductors, current id due to the flow of:

a) Electrons.
b) Protons.
c) Holes.
d) Electrons and holes.

16. Semi conductor junction diode has a property of:

a) Free conduction.
b) One way conduction.
c) Two conduction.
d) Reverse conduction.

17. A device that converts A.C into D.C is:

a) Oscillator.
b) Amplifier.
c) Rectifier.
d) Photoconductor.

18. A pn-junction diode can be used as:

a) Rectifier.
b) Amplifier.
c) Transistor.
d) Oscillator.

19. When p-type material of a pn-junction is connected with positive terminal and n-type with the negative terminal of a battery it is said to be:

a) Forward biased.
b) Reverse biased.
c) Zero biased.
d) None of the above.

20. When p-type material of a pn-junction is connected with negative terminal and n-type with the positive terminal of a battery it is said to be:

a) Forward biased.
b) Reverse biased.
c) Zero biased.
d) None of the above.

21. A pn-junction conducts when it is:

a) Forward biased.
b) Reverse biased.
c) Zero biased.
d) None of him above.

22. A pn-junction offers minimum resistance when it is:

a) Forward biased.
b) Reverse biased.
c) Zero biased.
d) None of the above.

23. Process to conversion of A.C into D.C is called:

a) Amplification.
b) Rectification.
c) Modulation.
d) Photo conductance.

24. A thin layer of one type of semi conductor (p-type or N-type) sandwiched between two thick layers of other type is called:

a) Diode.
b) Modulator.
c) Rectifier.
d) Transistor.

25. Usually a transistor is used as:

a) Amplifier.
b) Rectifier.
c) Oscillator.
d) Modulator.

26. A single pn-junction diode acts as:

a) Amplifier.
b) Rectifier.
c) Oscillator.
d) Modulator.

27. Process of addition of group five impurities such as arsenic, antimony etc. in a germanium or silicon crystal produces an excess electron for conduction, hence it is known as:

a) Acceptor doping.
b) Donor doping.
c) Forward doping.
d) Reverse doping.

28. For normal working of a transistor its emitter-base junction is:

a) Forward biased.
b) Reverse biased.
c) Zero biased.
d) None of the above.

29. For normal working of a transistor its collector-base junction is:

a) Forward biased.
b) Reverse biased.
c) Zero biased.
d) None of the above.

30. When a pn-junction is reversing biased, it offers:

a) Zero resistance.
b) Maximum resistance.
c) Minimum resistance.
d) None of the above.

31. P-type semi conductor is obtained by adding impurity materials of group: (6-a, 2001)

a) Five elements.
b) Three elements.
c) Four elements.
d) Six elements.

32. The forbidden energy gap between the valance band and the conduction band in a semi conductor is: (5-a, 2002 P.M)

a) Fairly large.
b) Relatively narrow.
c) Zero.
d) Infinite.

33. The speed of electromagnetic waves depends on: (6-a, 2002, P.M)

a) Permeability only.
b) Permittivity only.
c) Both on permeability and permittivity.
d) None of them.

34. Semi – conductor diode can be used as: (6-a, 2002, P.M)

a) Amplifier.
b) Rectifier.
c) Potentiometer.
d) Voltmeter.

35. A semi-conductor diode is used as: (3-a, 2003, P.M)

a) An amplifier.
b) An oscillator.
c) A rectifier.
d) None of these.

36. The elements of group IV, like Ge and Si can be converted to p-type semi-conductors by: (5-a, 2003, P.M)

a) Adding impurity of group V elements.
b) Adding impurity of group III elements.
c) Adding impurity of both group V and III elements.
d) None of the above.

37. In a semiconductor, the energy gap between the valance band and the conduction band is: (1-vii, 2020)

a) Narrow.
b) Wide.
c) Not present.
d) 10^{-6} Ω-m.

38. Donor impurities are: (1-xiii, 2010)

a) Ge and Si.
b) In and Ga.
c) Sb and As.
d) Li and Ga.

ANSWERS

(1) Accelerated electrons.
(2) Electric and magnetic fields vibrating perpendicular to each other.
(3) Perpendicular to electric as well as magnetic field vectors.
(4) Electric as well as magnetic properties of the medium.
(5) $C = 1\sqrt{\varepsilon_o}\ \mu_o$.
(6) $3x10^8$ m/s.
(7) Semi conductors.
(8) Electrons and holes.
(9) Tetravalent.
(10) Insulators.
(11) Doping.
(12) P-type.
(13) N-type.
(14) Holes.
(15) Electrons.
(16) One way conduction.
(17) Rectifier.
(18) Rectifier.
(19) Forward biased.
(20) Reverse biased.
(21) Forward biased.
(22) Forward biased.
(23) Rectification.
(24) Transistor.
(25) Amplifier.
(26) Rectifier.
(27) Donor doping.
(28) Forward biased.
(29) Reverse biased.
(30) Maximum resistance.
(31) Three elements.
(32) Relatively narrow.
(33) Both on permeability and permittivity.
(34) Rectifier.
(35) A rectifier.
(36) Adding impurity of group III elements.
(37) Narrow.
(38) Sb and As.