Ch-1. Electronic Devices

Q.1. Define electronics ? [2]

Q.2. Mention some important applications of electronics ? [5]

Q.3. Explain electron emission ? [2]

Q.4. What are the different types of electronic emission ? [5]+[5]
explain each type briefly ?

Q.5. Explain how valence electrons describe the electrical behaviour of a material ? [3]

Q.6. Explain how materials can be classified depending upon their electrical conductivity or characteristics ? [5]

Q.7. What is energy band structure of an atom ? define valence band, conduction band and forbidden energy gap ? [2+5]

Q.8. Draw energy band diagrams of conductor, semiconductor and non conductor ? [5]

Q.9. Explain how semiconductor can be classified ? what are the different types ? [5]

Q.10. Differentiate between intrinsic and extrinsic semiconductor ? [5]

Q.11. Explain how p type & n type extrinsic semiconductors are produced from pure (intrinsic) semiconductor ? [5]

Q.12. Differentiate between vacuum tube and semiconductor devices? [5]

Q.13. Explain how P-N junction acts as a diode? [5]

Q.14. what is biasing of a P-N junction? How a P-N junction behaves during forword bias and reverse bias? [2+5]

Q.15. Draw the circuit diagram for obtaining the V-I characteristics of a P-N junction diode? and draw the VI characteristic? [5+5]

Q.16. Explain i) cut in voltage/knee voltage/ threshold voltage and ii) Breakdown voltage of a diode from the V-I characteristics? [5]

Q.17. what are the different uses of diode? [5]

Q.18. what is a zener diode? what are its uses? [5]

Q.19 what is an LED? [5].

Q.20 what is integrated circuit? [5]

Q.21. what are the advantages and disadvantages of an IC? [5].

Q.22. Define the terms a) surface barier b) work function? [2]

Q.23. what general condition must be satisfied before an electron can escape from the surface of a material? [5].

Multiple choice questions

1. The outermost orbit of an atom can have a maximum of _____ electrons.

a) 2 b) 4 c) 8 d) 16.

2. When the outermost orbit of an atom has less than 4 electrons, the material is generally a _____.

a) conductor b) insulator.

c) semiconductor d) non of the above.

3. The valence electron have _____.

a) very small energy b) least energy

c) maximum energy d) non of the above

4. A large no. of free electrons exist in ___

a) semiconductors b) conductors.

c) insulators d) none of the above.

5. When the outermost orbit of an atom have exactly 4 electrons, the material is generally ___

a) metal b) non metal

c) semiconductor d) ~~all the~~ none of the above

6. When the outermost orbit of an atom have more than 4 electrons, the material is generaly a _____

a) metal b) non metal

c) semiconductor d) none of the above.

Q.7. workfunction of metals is generally measured in the unit of - - - -

a) Joules b) erg c) watt d) electron volt

Q.8. The electrons emitted by a thermionic emitter are called - - - -

a) free electrons b) loose electrons

c) thermionic electrons d) bound electrons.

Q.9. field emission is utilized in - - - -

a) vacuum tubes b) TV picture tubes.

c) gas filled tubes d) mercury pool devices

Q.10. Thermionic emitters are required to have - - - workfunction.

a) low b) high c) medium d) very high.

Q.11 The electrons in the 3rd orbit of an atom have - - - energy than the electrons in the 2nd orbit.

a) more b) less c) same d) none of the above

Q.12. when an electron jumps from higher orbit to a lower orbit, it - - - - energy.

a) absorbs b) emits c) sometime absorbs sometime emits d) none of the above.

Q.13. A semiconductor has - - - band.

a) almost empty valence b) almost empty conduction

c) almost full conduction d) none of the above.

Ch:2

------ QUESTION BANK -------

Q.1 Define a rectifier and explain its use? [2]

Q.2. what are the different types of rectifiers and why they called so? [2]

Q.3. With neat circuit diagram and input, output waveforms, explain the operation of a half wave rectifier? [5]

Q.4. Derive efficiency of a HWR, explain its advantages and disadvantages? [5].

Q.5. with neat circuit diagram and input output waveform explain the operating
- a) centretap FW rectifier [5]
- b) Bridged FW rectifier [5].

Q.6. Derive PIV of centretap FW rectifier? Explain its advantages & disadvantages) [5]

Q.7 Derive PIV of FW bridge rectifier and explain its advantages & disadvantages [5]

Q.8 Derive efficiency of FW rectifier? [5].

Q.9. Explain ripple and ripple factor for HW & FW rectifier? [2+3]

Q.10 what is a filter? why it is needed? [2]

Q.11 with neat circuit diagram and waveforms explain the opration of ——

a) capacitor filter b) choke input filter
c) capacitor input filter [5+5+5]

Q.12. with block diagram and output wave form of each block, explain the working of DC power supply? [5]

Q.13 What is a transistor? why the name is such? [2]

Q.14 what are the different types of transistors? Draw symbols of each? [2]

Q.15 what are the different types of transistor configurations? draw the connection diagram of each connection separately with NPN & PNP transistors? [7]

Q.16 explain the operation of —
- npn transistor
- pnp transistor. [5]

Q.17. ~~Derive~~ explain current gain of a transistor in —
a) CB configuration
b) CE configuration
c) CC configuration.

Q.18 derive the relationship between –
a) α & β b) β & γ c) α & γ
d) α, β & γ

Q.19 what is the need of biasing in a transistor ? [2]

Q.20 what are the different types of biasing used in a transistor amplifier ? [2]

Q.21 Draw the circuit diagram and explain the biasing methods –
a) Base resistor bias [2X4]
b) emitter bias
c) collector feedback bias
d) potential divider bias

Q.22 with neat circuit diagram explain the operation of a CE amplifier ? [5]

Q.23 what is stage of an amplifier ? draw the ckt of a single stage CE amplifier ? [5]

Q.24 what is oscillation ? what are the different types ? [2]

Q.25 Explain the operation of a basic oscillator ckt ? [5]

Ch-2, multiple choice questions

Q.1. The crystal diode has a forward resistance of the order of —
a) KΩ b) MΩ c) mΩ d) Ω

Q.2. A crystal diode has —
a) Two P-N junctions b) one P-N junction
c) Three P-N junctions d) four P-N junctions.

Q.3. When arrow head of a crystal diode is +ve and tail is -ve, then the diode is
a) forward biased b) reverse biased c) unbiased
d) fully biased.

Q.4. The reverse current in a diode is of the order of —
a) KA, b) MA c) mA d) μA

Q.5 The dc resistance of a crystal diode is — than its ac resistance.
a) more b) less c) greater d) fewer.

Q.6. When the graph between voltage across and current through a device is a straight line the device is said to be —
a) linear b) non linear c) circular d) parabolic

Q.7 The disadvantage of a halfwave rectifier is that the
a) components are expensive.
b) it uses less no. of components.
c) the output is difficult to filter
d) non of the above.

Q.8 If the PIV rating of a diode is exceeded
a) the diode conducts poorly.
b) the diode is destroyed.
c) the diode behaves as a zener diode.
d) non of the above.

Q.14. The electrons in the conduction band are known as - ——

a) band electrons b) valence electrons
c) free electrons d) none of the above

Q.15 In insulators, the energy gap between valence band and conduction band is ——

a) large b) very large c) very small d) none of the above

Q.16. In a semiconductor the energy gap between valence and conduction band is about ——.

a) 15 eV b) 100 eV c) 10 eV d) 1 eV.

Q.17. The energy gap between valence band and conduction band in an insulator is about —

a) 15 eV b) 1.5 eV c) 0.15 eV d) 150 eV.

Q.18 A semiconductor is formed by —— bond.

a) covalent b) electrovalent c) ionic
d) non of the above.

Q.19. A semiconductor has —— temperature coefficient of resistance.

a) positive b) negative c) zero d) non of the above

Q.20 when a pure semiconductor is heated its resistance — — ——.

a) goes up b) goes down c) remains same
d) none of the above.

Q.21. Adding pentavalent impurity to a pure semiconductor will produce ———

a) insulator b) intrinsic semiconductor.

c) p-type semiconductor d) n-type semiconductor

Q.22. Adding pentavalent impurity to a semiconductor creates many ———.

a) free electrons b) holes

c) valence electrons d) bound electrons

Q.23. A hole in the semiconductor is defined as ———

a) free from electron b) incomplete part of an electron pair bond.

c) a free proton d) a free neutron.

Q.24. The impurity level in an extrinsic semiconductor is about ——— of pure semiconductor.

a) 10 atoms for 10^8 atoms b) 1 atom for 10^8 atoms

b) 1 atom for 10^1 atoms d) 1 atom for 10^6 atoms.

Q.25. In a semiconductor, the current conduction is due to ———

a) only holes b) only electrons

c) both holes & electrons d) non of the above.

Q.26.

Ch-3

----- QUESTION BANK ---------

Q1 what is communication ? [2]

Q.2. with a neat block diagram explain each component of a communication system ? [7]

Q.3. what is a transmitter ? [2]

Q.4. what is a receiver ? [2]

Q.5 what is a communicating medium ? [2]

Q.6. what is modulation ? [2]

Q.7. why modulation is necessary ? [2]

Q.8 what is demodulation ? [2]

Q.9 why demodulation is necessary ? [2]

Q.10 point wise give a comparative description of modulation and demodulation ? [5]

Q.11 what are the different types of modulation ? [2]

Q.12 Define and explain Amplitude Modulation ? [6]

Q.13 Define and explain frequency modulation ? [6]

Q.14 Define and explain phase modulation ? [6]

Q.15 what are the advantages and disadvantages of Amplitude modulation ? [5]

Q.16 what are the advantages and disadvantages of frequency modulation ? [5]

Q.17. Explain how PM can be obtained from FM and vice-versa ? [5]

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CA-4

------- QUESTION BANK --------

Q.1. Define a transducer ? [2]

Q.2. Define a sensor ? [2]

Q.3. Give examples of transducers and sensors? [2]

Q.4. Compare transducer with sensor ? [2]

Q.5. what are the different classifications of transducers ? [5]

Q.6. Define and explain —

a) active and passive transducers [2]

b) primary and secondary transducers. [2]

c) analog and digital transducers [2]

Q.7 Define and explain a photoemissive transducer ? [5]

Q.8 Define and explain a photoconductive transducer ? [5]

Q.9. Define and explain a photovoltaic transducer ? [5]

Q.10 Define a multimeter ? Explain some of its applications ? [5]

Q.11 what are the two selector switches found on an analog multimeter ? what are their functions? [5]

Q.12 With schematic diagram explain the operation of an AMM ? [5]

Q.13 How dc current and voltages can be measured in an AMM ? [5]

Q.14 To measure ac quantities, what additional component is added to a multimeter ? [2]

Q.15 Draw ~~and~~ the schematic diagram of a DMM ? [5] and explain ?

Q.16 Draw the block diagram of a DMM & explain [5]

Q.17 compare analog and digital meters? [5]

Q.18 What is a CRO ? [2]

Q.19 Draw a neat block diagram of a CRO and explain each block ? [5]

Q.20 Explain the working of CRO ? [5]