

Question No 1 (20 degrees)**Total (50 degrees)****Write in the attached table the symbol indicating the correct answer**

1. Some materials have: *A. strong attraction B. weak attractions* and: *A. refuse to loss electrons B. allow electrons to be lost*, these are called: *A. insulators B. conductors*
2. Receiving an electric shock from a doorknob is an example of:
A. Current electricity B. Static electricity C. Spontaneous electricity
3. Our body behaves as: *(A) a conductor (B) an insulator*. and there is potential difference between the source and ground thus we will shock
4. is the energy required to jump the electron from one energy level to other
A. Excitation potential B. Ionization potential
5. ...is the energy required to remove an electron from an atom
A. Excitation potential B. Ionization potential
6. The difference between an insulator and a semiconductor is
A. Wider forbidden gap B. The number of free electrons C. The atomic structure D. All of the above
7. Ohm's law is not obeyed by: *A. Conductor B. Semiconductor C. None of the above*
8. In a semiconductor, the energy gap between the valence band and conduction band is about
A. 5 eV B. 10 eV C. 15 eV D. 1 eV
9. The resistivity of a semiconductor ... conductors and insulators
A. More than that of B. Lies between that of C. Less than that of
10. A semiconductor generally has ___ valence electrons. *A. 14 B. 32 C. 4*
11. A pure Si wafer is said to act as: *A. insulator B. conductor*
12. The most commonly used semiconductor is: *A. Germanium B. Carbon C. Silicon*
13. In an intrinsic semiconductor, the number of free electrons: *A. Equals the number of holes B. Is greater than the number of holes C. Is less than the number of holes*
14. At room temperature, the charge carried in an intrinsic semiconductor is:
A. Free Electrons B. Holes C. Free electrons and holes D. Holes and ions
15. When a pure semiconductor is heated, its resistance
A. Goes down B. Goes up C. Remains the same D. None of the above
16. When a pentavalent impurity is added to a pure semiconductor it becomes:
A. Intrinsic B. n-type C. p-type D. None of the above
17. Addition of pentavalent impurity to semiconductors creates many
A. Free Electrons B. Holes C. Valence electrons
18. A pentavalent impurity is called.....impurity *A. Donor B. Acceptor C. Ionic*
19. When a trivalent impurity added to a pure semiconductor it becomes
A. Intrinsic B. n-type C. p-type
20. Addition of trivalent impurity to semiconductors creates many:
A. Free Electrons B. Holes C. Valence electrons

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21. A trivalent impurity is called..... impurity: A. Donor B. Acceptor C. Ionic
22. A hole in a semiconductor is defined as a free.....
A. electron B. proton C. neutron D. None of the above
23. As a general rule, holes are found only in: A. Metals B. Semiconductor C. Insulator
24. The magnitude of the charge of a hole is:
A. Zero B. Equal to that of a proton C. Equal to that of an electron
25. By adding impurities in semiconductor, the bulk resistance of a semiconductor
A. Decreases B. Remain the same C. Increases
26. P-Type semiconductor is: A. +ve charged B. -ve charged C. uncharged
27. The random motion of holes and free electrons due to thermal agitation is called:
A. Ionization B. Pressure C. Diffusion
28. Which causes the barrier layer in a PN junction? A. Doping B. Recombination C. Ions
29. The depletion region contains: A. Sea of Electrons B. Holes C. Immobilized charge carriers
30. A forward biased PN junction has a resistance of the Order of: A. Ω B. $K\Omega$ C. $M\Omega$
31. The battery connections required to forward bias PN junction are:
A. +ve terminal to p and -ve terminal to n B. -ve terminal to p and +ve terminal to n
C. -ve terminal to p and -ve terminal to n
32. When a diode is forward biased, the recombination of the free electrons and holes may produce: A. Heat B. Light C. Radiation D. All of the above
33. When the diode is forward biased, it is equivalent to: A. An off switch B. An On switch
34. The leakage current is least in: A. Germanium B. Silicon C. Carbon
35. When a reverse bias is applied to a diode, it will: A. Raise the potential barrier
B. Lower the potential barrier C. Increases the majority-carrier a current greatly
36. Avalanche breakdown in a diode occurs when: A. Potential barrier is reduced to zero.
B. Forward current exceeds certain value C. Reverse bias exceeds a certain value.
37. What does LED stand for? A. Light Emitting Display B. Low Energy Display
C. Light Emitting Diode D. Light Emitting Detector
38. What are the 2 types of transistors? A. Positive, Negative B. X, Y C. NPN, PNP
39. CD player is an example of a system using: A. a digital method B. an analog method C. all of the above
40. To change the digital data into an analog signal & Vice versa, we use:
A. (DAC) B. (ADC) C. all the above

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Question No 2 (20 degrees)

Write in the attached table the symbol (T) for true answer or (F) for false answer

1. Matter annihilates, energy appears. Energy disappears, matter appears
2. Our mission - only - is to follow the behaviors and actions of the universe to produce what we need
3. Any amount of mass, no matter how small, contains an enormous amount of energy
4. Energy has no priority over mass or mass over energy
5. The origins of the universe, in order, are: Noor -light - radiation - energy - matter
6. Some materials have: strong attractions and refuse to electrons loss, these are called insulators
7. Some materials have: weak attractions and allow electrons to be lost, these are called insulators
8. Examples of insulating mat.: air, glass, rubber, plastics
9. Our body behaves as: an insulator, and there is potential difference between the source and ground thus we will shock
10. Ionization potential: is the energy required to jump the electron from one energy level to other
11. Excitation potential is the energy required to remove an electron from an atom
12. The forbidden energy gap in a semiconductor is: 0 eV
13. In insulators the electrons in the valence band are separated by a large gap from the conduction band
14. In conductors like metals the valence band overlaps the conduction band
15. In semiconductors there is a small enough gap between the valence and conduction bands that thermal or other excitations can bridge the gap.
16. The resistivity of a semiconductor *is More than that of* conductors and insulators
17. The resistivity of a semiconductor *Lies between that of* conductors and insulators
18. A semiconductor generally has 8 valence electrons.
19. Atoms in a pure silicon wafer contains four electrons in outer orbit (called valence electrons)
20. In pure form, Si wafer does not contain any free charge carriers.
21. An applied voltage across pure Si wafer does not yield electron flow through the wafer.
22. In the crystalline lattice structure of Si, the valence electrons of every Si atom are locked up in covalent bonds with the valence electrons of four neighboring Si atoms
23. A semiconductor is formed by covalent bonds
24. A semiconductor is formed by ionic bonds

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25. The number of free electrons and holes in an intrinsic semiconductor increases when the temperature increases
26. When a pure semiconductor is heated, its resistance remains the same
27. When a pentavalent impurity is added to a pure semiconductor, it becomes: P-type.
28. A pentavalent impurity is called Acceptor impurity
29. Free Electrons cannot move
30. Some of application areas of semiconductor diodes include: Communication & radar systems, computer & power supply systems, television system
31. Electron combines with the hole is equivalent to moving from a higher orbit to a lower energy orbit.
32. In a reverse biased diode, some current flows through the depletion region. This current is called leakage current
33. The leakage current of diode is the current that the diode will leak when a reverse voltage is applied to it
34. The p-side is called anode and the n-side is called cathode.
35. The p-side is called cathode and the n-side is called anode
36. The transistor replaces the Vacuum Tubes
37. A quantity having continuous values is: a digital quantity
38. A quantity having a discrete set of values is a digital quantity
39. Digital has certain advantages over analog in electronics applications
40. Compared to analog systems, digital systems are less prone to noise

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Question No 3 (10 degrees)

Circle the wrong word or words and correct them in the specified place

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| 1. Excitation potential is the energy required to remove an electron from an atom |
| 2. A semiconductor generally has 8 valence electrons. |
| 3. A semiconductor is formed by ionic bonds |
| 4. A quantity having continuous values is: a digital quantity |
| 5. Compared to analog systems, digital systems are more prone to noise |

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انتهت اسئلة اشباه الموصلات والاعشبة الرقيقة مع التمنيات بالتوفيق ___ اسم الممتحن د / حسام وحيد