Topic :-.SEMICONDUCTOR ELECTRONICS: MATERIALS,DEVIES AND SIMPLE CIRCUITS

1. P-type semiconductor is formed when
    A. As impurity is mixed in Si
    B. Al impurity is mixed in Si
    C. B impurity is mixed in Ge
    D. P impurity is mixed in Ge
    a) A and C   b) A and D   c) B and C   d) B and D

2. The energy gap of silicon is 1.14 eV. The maximum wavelength at which silicon starts energy absorption, will be $(h = 6.62 \times 10^{-34} \text{ Js}; c = 3 \times 10^8 \text{ms}^{-1})$
    a) 10.888 Å   b) 108.88 Å   c) 1088.8 Å   d) 10888 Å

3. In the following common emitter configuration an NPN transistor with current gain $\beta = 100$ is used. The output voltage of the amplifier will be

    a) 10 mV b) 0.1 V c) 1.0 V d) 10 V
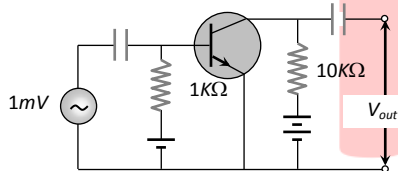
4. When plate voltage in diode valve is increased from 100 $volt$ to 150 $volt$ then plate current increases from 7.5 mA to 12 mA. The dynamic plate resistance will be
    a) 10 $k\Omega$ b) 11 $k\Omega$ c) 15 $k\Omega$ d) 11.1 $k\Omega$

5. Current gain in common base configuration is less than 1 because

    a) $I_e < I_b$ b) $I_b < I_e$ c) $I_c < I_e$ d) $I_e < I_c$

6. The output of OR gate is 1
    a) If both inputs are zero   b) If either or both inputs are 1
   c) Only if both input are 1   d) If either input is zero

7. In a forward biased p-n junction diode, the potential barrier in the depletion region is of the form

a)

b)

c)

d)
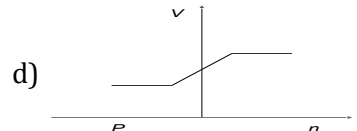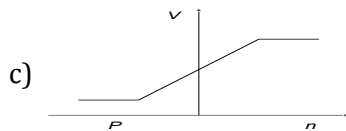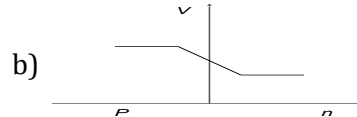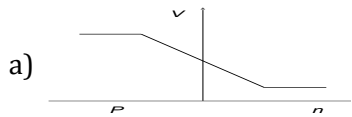
8. A silicon specimen is made into a p-type semiconductor by dropping, on an average, one indium atom per 5×10^7 silicon atoms. If the number density of atoms in the silicon specimen is 5×10^{28} atoms m^{-3}, then the number of acceptor atoms in silicon per cubic centimeter will be
a) 2.5×10^{30} atoms cm^{-3}
b) 2.5×10^{35} atoms cm^{-3}
c) 1.0×10^{13} atoms cm^{-3}
d) 1.0×10^{15} atoms cm^{-3}

9. Which of the following gates will have an output of 1
a)
b)
c)
d)
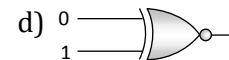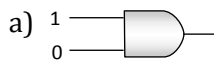
10. A full wave rectifier circuit along with the input and output are shown in the figure, the contribution from the diode I is (are)
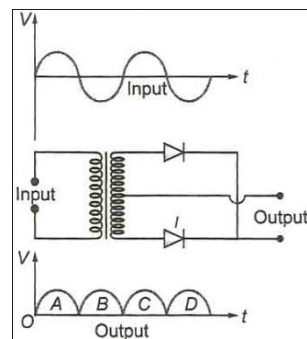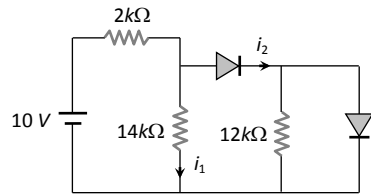

a) C b) A, C c) B, D d) A, B, C, D

11. The output of a NAND gate is 0
a) If both inputs are 0
b) If one input is 0 and the other input is 1
c) If both inputs are 1
d) Either if both inputs are 1 or if one of the inputs is 1 and the other 0

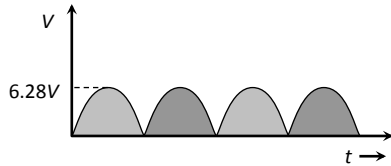12. In the following circuit I_1 and I_2 are respectively

   a) 0, 0   b) 5 mA, 5 mA c) 5 mA, 0   d) 0, 5 mA

13. Which impurity is doped in Si to form N-type semi-conductor
   a) Al b) B c) As d) None of these

14. For given electric voltage signal dc value is

   a) 6.28 V b) 3.14 V c) 4 V d) 0 V

15. The electrical conductivity of a semiconductor increases when electromagnetic radiation of wavelength shorter than 2480 nm, is incident on it. The band gap in (eV) for the semiconductor is
   a) 1.1 eV   b) 2.5 eV   c) 0.5 eV   d) 0.7 eV

16. The resistance of a germanium junction diode whose $V - I$ is shown in figure is ($V_k = 0.3\ V$)
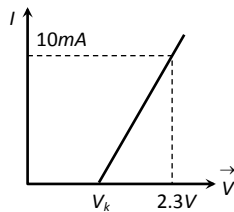
   a) 5 $k\Omega$ b) 0.2 $k\Omega$ c) 2.3 $k\Omega$ d) $\left(\dfrac{10}{2.3}\right)k\Omega$

17. When a p-n junction diode is reverse biased, then
   a) No current flows
   b) The depletion region is increased
   c) The depletion region is reduced
   d) The height of the potential barrier is reduced

18. In the given circuit for ideal diode, the current through the battery is
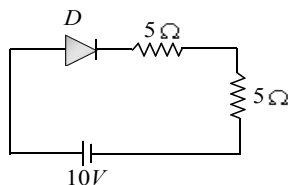
   a) 0.5 A b) 1.5 A c) 1.0 A d) 2 A

19. The plate current in a vacuum diode depends on
   a) Cathode temperature only   b) Plate voltage only
   c) Both plate voltage and cathode temperature d) None of these

20. A common emitter amplifier given an output of 3 V for an input of 0.01 V. If β of the transistor is 100 and the input resistance is 1 kΩ, then the collector resistance is

a) 1 kΩ   b) 3 kΩ   c) 30 kΩ   d) 30 Ω