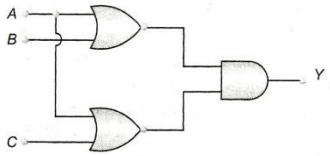
DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 6**

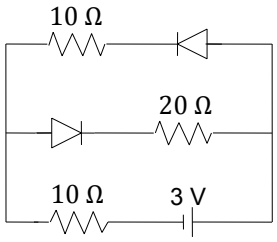
Topic :-.SEMICONDUCTOR ELECTRONICS: MATERIALS,DEVIES AND SIMPLE CIRCUITS

1. The conduction band in a solid is partially filled at 0 K. The solid sample is a
   a) Conductor b) Semiconductor c) Insulator d) None of these
2. For a given triode $\mu = 20$. The load resistance is 1.5 times the anode resistance. The maximum gain will be
   a) 16 b) 12 c) 10 d) None of the above
3. The output of given logic circuit is

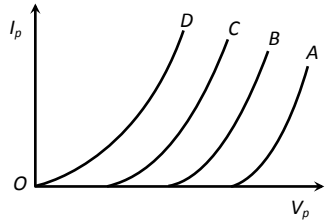


   a) $A + B + C$ b) $(A + B) \cdot (A + C)$ c) $A \cdot (B \cdot C)$ d) $A \cdot (B + C)$
4. A transistor is operated in common-emitter configuration at $V_c = 2V$ such that a change in the base current from 100 μA produces a change in the collector current from 5 mA to 10 mA. The current gain is
   a) 75 b) 100 c) 150 d) 50
5. $p - n$ junction is said to be forward biased, when
   a) The positive pole of the battery is joined to the p-semiconductor and negative pole to the n-semiconductor
   b) The positive pole of the battery is joined to the n-semiconductor and negative pole to the n-semiconductor and p-semiconductor
   c) The positive pole of the battery is connected to n-semiconductor and p-semiconductor
   d) A mechanical force is applied in the forward direction
6. A p-type material is electrically …….
   a) Positive
   b) Negative
   c) Neutral
   d) Depends on the concentration of p impurities
7. The slope of plate characteristic of a vacuum tube diode for certain operating point on the curve is $10^{-3}\frac{mA}{V}$. The plate resistance of the diode and its nature respectively
   a) 100 $kilo\text{-}ohms$ static b) 1000 $kilo\text{-}ohms$ static
   c) 1000 $kilo\text{-}ohms$ dynamic d) 100 $kilo\text{-}ohms$ dynamic

8. Bonding in a germanium crystal (semi-conductor) is
   a) Metallic b) Ionic c) Vander Waal's type d) Covalent
9. In a semiconducting material the mobilities of electrons and holes are μ_e and μ_h respectively. Which of the following is true
   a) $\mu_e > \mu_h$ b) $\mu_e < \mu_h$ c) $\mu_e = \mu_h$ d) $\mu_e < 0; \mu_h > 0$
10. The voltage gain of triode amplifier is 30 and input voltage is $V_i = \sin 100\pi t$, then output voltage will be
    a) $30 \sin 100\ \pi t$ b) $\sin 100\ \pi t$ c) $-30 \sin 100\ \pi t$ d) $-\sin 100\ \pi t$
11. In a common-base mode of a transistor, the collector current is 5.488 mA for an emitter current of 5.60 mA. The value of the base current amplification factor (β) will be
    a) 49 b) 50 c) 51 d) 48
12. In the network show, the current flowing through the battery of negligible internal resistance is



    a) 0.10 A b) 0.15 A c) 0.20 A d) 0.30 A
13. In a transistor if collector current is 25 mA and base current is 1 mA, then current amplification factor α is
    a) $\frac{25}{24}$ b) $\frac{24}{25}$ c) $\frac{25}{26}$ d) $\frac{26}{25}$
14. In a triode amplifier, the value of maximum gain is equal to
    a) Half the amplification factor b) Amplification factor
    c) Twice the amplification factor d) Infinity
15. Which one of the following is the weakest kind of bonding in solids
    a) Ionic b) Metallic c) Vander Waals d) Covalent
16. The logic behind 'NOR' gate is that it gives
    a) High output when both the inputs are low
    b) Low output when both the inputs are low
    c) High output when both the inputs are high
    d) None of these
17. In the figure four plate characteristics of a triode at different grid voltages are shown. The difference between successive grid voltage is 1 V. Which curve will have maximum grid voltage and what is its value



    a) $A, V_g = +4\ V$ b) $B, V_g = +4\ V$ c) $A, V_g = 0$ d) $D, V_g = 0$

18. The expected energy of the electrons at absolute zero is called
    a) Fermi energy b) Emission energy c) Work function d) Potential energy
19. In a transistor the base is
    a) An insulator b) A conductor of low resistance
    c) A conductor of high resistance d) An extrinsic semiconductor
20. If control grid is made negative, then the plate current will
    a) Increase b) Remain constant
    c) Decrease d) Cannot say from given data