# DPP

**DAILY PRACTICE PROBLEMS**

**Class : XIIth**                     **Subject : PHYSICS**
**Date :**                            **DPP No. : 10**

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

1. The current gain of a transistor in a common emitter configuration is 40. If the emitter current is 8.2 mA, then base current is
   a) 0.02 mA        b) 0.2 mA        c) 2.0 mA        d) 0.4 mA

2. In order to prepare a $p$-type semiconductor, pure silicon can be doped with
   a) Phosphorus        b) Aluminium        c) Antimony        d) Germanium

3. The current in a triode at anode potential $100\ V$ and grid potential $-1.2\ V$ is $7.5\ mA$. If grid potential is changed to $-2.2\ V$, the current becomes $5.5\ mA$. the value of trans conductance ($g_m$) will be
   a) $2\ mili\ mho$        b) $3\ mili\ mho$        c) $4\ mili\ mho$        d) $0.2\ mili\ mho$

4. If $A$ and $B$ are two inputs in AND gate, then AND gate has an output of 1 when the values of $A$ and $B$ are
   a) $A = 0, B = 0$        b) $A = 1, B = 1$        c) $A = 1, B = 0$        d) $A = 0, B = 1$

5. A gate in which all the inputs must be low to get a high output is called
   a) A NAND gate        b) An inverter        c) A NOR gate        d) An AND gate

6. A $NPN$ transistor conducts when
   a) Both collector and emitter are positive with respect to the base
   b) Collector is positive and emitter is negative with respect to the base
   c) Collector is positive and emitter is at same potential as the base
   d) Both collector and emitter are negative with respect to the base

7. An alternating voltage of $141.4V\ (rms)$ is applied to a vacuum diode as shown in the figure. The maximum potential difference across the condenser will be
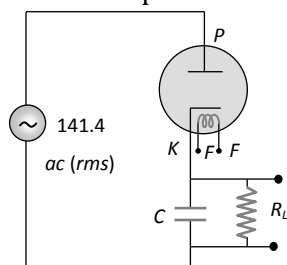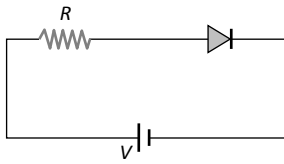
   

   a) $100\ V$        b) $200\ V$        c) $100\sqrt{2}\ V$        d) $200\sqrt{2}V$

---

8. A zener diode, having breakdown voltage equal to 15 $V$, is used in a voltage regulator circuit shown in figure. The current through the diode is
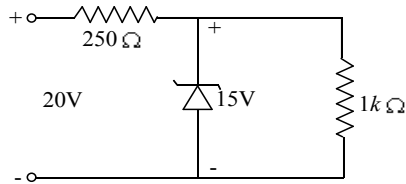


a) 20 $mA$      b) 5 $mA$      c) 10 $mA$      d) 15 $mA$

9. For the given circuit of $PN$-junction diode, which of the following statement is correct



a) In forward biasing the voltage across $R$ is $V$
b) In forward biasing the voltage across $R$ is $2V$
c) In reverse biasing the voltage across $R$ is $V$
d) In reverse biasing the voltage across $R$ is $2V$

10. Current gain in common emitter configuration is more than 1 becomes
a) $I_c < I_b$      b) $I_c < I_e$      c) $I_c > I_e$      d) $I_e > I_b$

11. The reason of current flow in $P$-$N$ junction in forward bias is
a) Drifting of charge carriers      b) Minority charge carriers
c) Diffusion of charge carriers      d) All of these

12. A triode whose mutual conductance is 2.5 $m\,A/volt$ and anode resistance is 20 $kilo\ ohm$, is used as an amplifier whose amplification is 10. The resistance connected in plate circuit will be
a) 1 $k\Omega$      b) 5 $k\Omega$      c) 10 $k\Omega$      d) 20 $k\Omega$

13. In the forward bias arrangement of a $PN$-junction diode
a) The $N$-end is connected to the positive terminal of the battery
b) The $P$-end is connected to the positive terminal of the battery
c) The direction of current is from $N$-end to $P$-end in the diode
d) The $P$-end is connected to the negative terminal of battery

14. If the forward voltage in a semiconductor diode is changed from 0.5 V to 0.7 V, then the forward current changes by 1.0 mA. The forward resistance of diode junction will be
a) 100 $\Omega$      b) 120 $\Omega$      c) 200 $\Omega$      d) 240 $\Omega$

15. For a common base configuration of $PNP$ transistor $\frac{I_C}{I_E} = 0.96$ then maximum current gain in common emitter configuration will be
a) 12      b) 24      c) 6      d) 5

16. Find $V_{AB}$
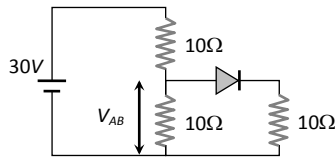


    a) $10\ V$                b) $20\ V$              c) $30\ V$              d) None of these

17. Thermionic emission from a heated filament varies with its temperature $T$ as

    a) $T^{-1}$                b) $T\ T$                c) $T^{2}$                d) $T^{3/2}$

18. The manifestation of band structure in solids is due to decreases the majority charge carries

    a) Heisenberg's uncertainty principle

    b) Pauli's exclusion principle

    c) Bohr's correspondence principle

    d) Boltzmann's law

19. A semiconductor dopped with a donor impurity is

    a) $P$-type             b) $N$-type             c) $NPN$ type          d) $PNP$ type

20. In semiconductors at a room temperature

    a) The valence band is partially empty and the conduction band is partially filled

    b) The valence band is completely filled and the conduction band is partially filled

    c) The valence band is completely filled

    d) The conduction band is completely empty