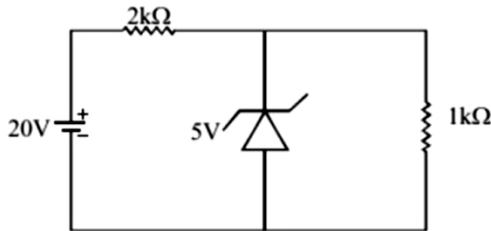


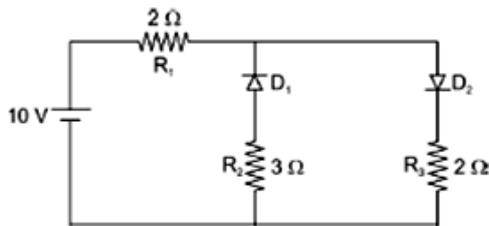
PHYSICS

21. Find current through Zener diode



- (1) 5 mA
- (2) 7.5 mA
- (3) 2.5 mA
- (4) 12.5 mA

22. The given circuit has two ideal diodes connected as shown in the figure below. The current flowing through the resistance R will be



- (1) 1.43 A
- (2) 3.13 A
- (3) 2.5 A
- (4) 10.0 A

23. The truth table shown below is for which of the following gates?

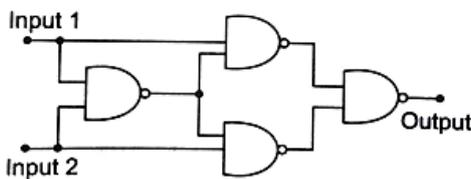
A	B	Y
1	1	0
1	0	0
0	1	0
0	0	1

- (1) AND
- (2) NAND
- (3) XOR
- (4) NOR

24. How many NAND gates are used to form AND gate?

- (1) 3
- (2) 2
- (3) 1
- (4) 4

25. For the following combination of gates select the correct statement



- (1) The output is 1 when both the inputs are 1
- (2) The output is 0 when both the inputs are 0
- (3) The output is 0 when the two inputs differ

(4) The output is 1 when the two inputs differ

26. **Statement-I:** By doping silicon semiconductor with pentavalent material, the electrons density increases

Statement-II: Then-type semiconductor has net negative charge

In the light of the above statements, choose the most appropriate answer from the options given below

- (1) Statement-I is true but Statement-II is false.
- (2) Statement-I is false but Statement-II is true
- (3) Both Statement-I and Statement-II are true.
- (4) Both Statement-I and Statement-II are false.

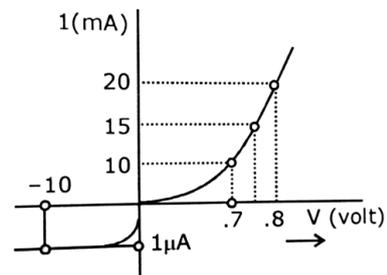
27. In a semiconductor the number density of intrinsic charge carries at 27° C is $1.5 \times 10^{16} \text{ m}^{-3}$. If the semiconductor is doped with impurity atom. the hole density increases to $4.5 \times 10^{22} \text{ m}^{-3}$. The electron density in the doped semiconductor is $\underline{\hspace{2cm}} \times 10^9$

- (1) $5 \times 10^9 \text{ m}^{-3}$
- (2) $6 \times 10^9 \text{ m}^{-3}$
- (3) $7 \times 10^9 \text{ m}^{-3}$
- (4) $8 \times 10^9 \text{ m}^{-3}$

28. Consider a situation in which reverse biased current of a particular P-N junction increases when it is exposed to Light of Wavelength $< 621 \text{ nm}$. During this process enhancement in carrier concentration takes place due to generation of hole-electron pairs. The value of band gap is nearly

- (1) 2 eV
- (2) 4 eV
- (3) 1 eV
- (4) 0.5 eV

29. The V-I characteristic of a diode is shown in the figure The ratio of forward to reverse bias resistance is



- (1) 10
- (2) 10^{-6}
- (3) 10^6
- (4) 100

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30. A ray of light falls on the surface of a spherical glass paper weight making an angle α with the normal and is refracted in the medium at an angle β . The angle of deviation of the emergent ray from the direction of the incident ray is

(1) $(\alpha - \beta)$

(2) $2(\alpha - \beta)$

(3) $\frac{(\alpha - \beta)}{2}$

(4) $(\alpha + \beta)$



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