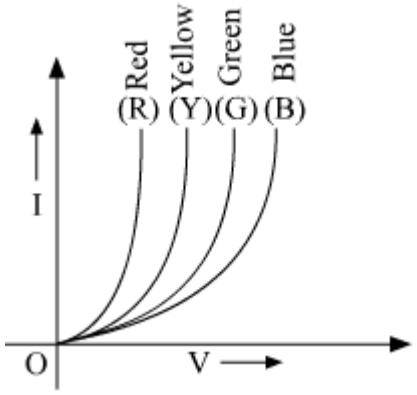
Semiconductor Electronics: Materials, Devices and Simple Circuits

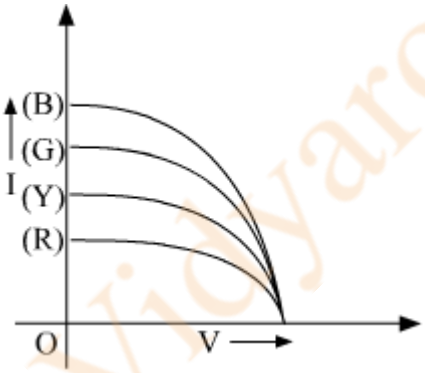
Q.No.1:
The I-V characteristic of an LED is:

JEE 2013

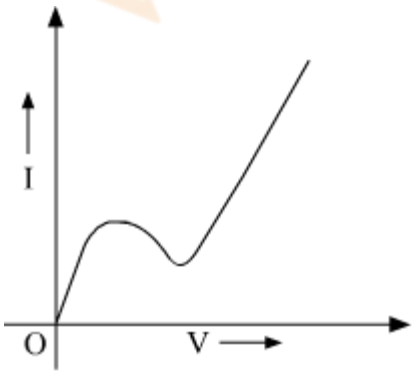
A.

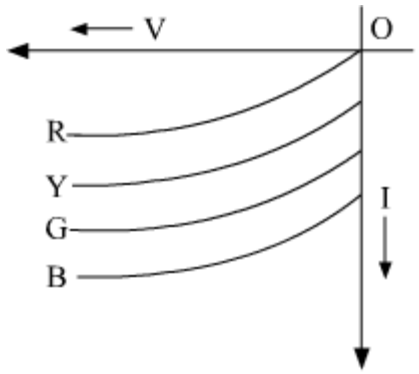


B.

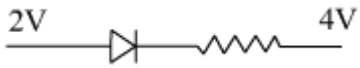


C.



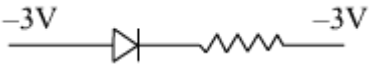
D. 

Q.No.2: The forward-biased diode connection is

A. 

B. 

C. 

D. 

Q.No.3: For a common emitter configuration, if α and β have their usual meanings, the incorrect relationship between α and β **JEE 2016**

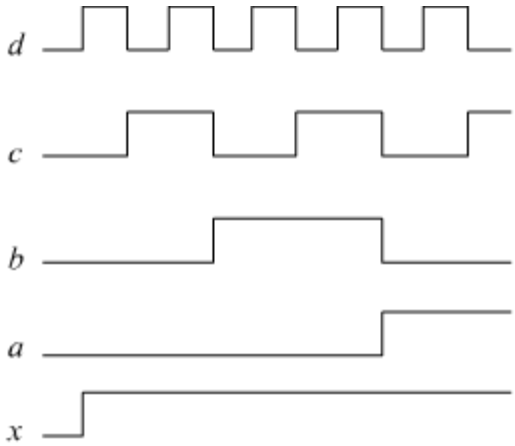
A. $\alpha = \frac{\beta}{1-\beta}$

B. $\alpha = \frac{\beta}{1+\beta}$

C. $\alpha = \frac{\beta^2}{1+\beta^2+2\beta}$

D. $\frac{1}{\alpha} = \frac{1}{\beta} + 1$

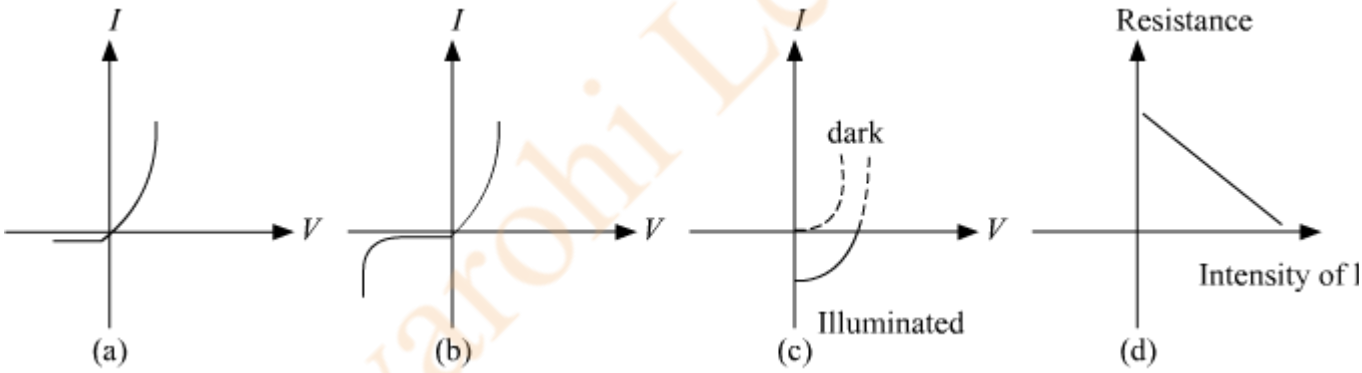
Q.No.4: If a, b, c, d are inputs to a gate and x is its output, then, as per the following time graph, the gate is:



JEE 2016

A. AND
B. OR
C. NAND
D. NOT

Q.No.5: Identify the semiconductor devices whose characteristics are given below, in the order (a), (b), (c), (d):



JEE 2016

A. Zener diode, Simple diode, Light dependent resistance, Solar cell
B. Solar cell, Light dependent resistance, Zener diode, Simple diode
C. Zener diode, solar cell, Simple diode, Light dependent resistance
D. Simple diode, Zener diode, Solar cell, Light dependent resistance

Q.No.6: The temperature dependence of resistances of Cu and undoped Si in the temperature range 300-400K, is best described by: **JEE 2016**

A. Linear increase for Cu, exponential increase for Si
B. Linear increase for Cu, exponential decrease for Si
C. Linear decrease for Cu, linear decrease for Si
D. Linear increase for Cu, linear increase for Si

Q.No.7: In a common emitter amplifier circuit using an n-p-n transistor, the phase difference between the input and the output voltages will be: **JEE 2017**

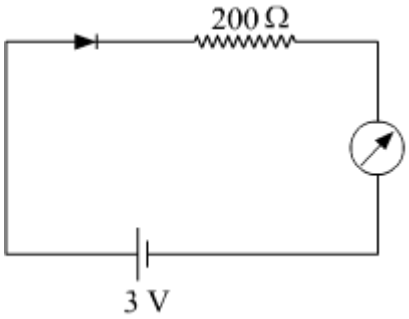
A. 180°

B. 45°

C. 90°

D. 135°

Q.No.8: The reading of the ammeter for a silicon diode in the given circuit is : **JEE 2018**



A. 11.5 mA

B. 13.5 mA

C. 0

D. 15 mA

Q.No.9: Mobility of electrons in a semiconductor is defined as the ratio of their drift velocity to the applied electric field. If, for an n-type semiconductor, the density of electrons is 10^{19} m^{-3} and their mobility is 1.6 $m^2/(V.s)$ then the resistivity of the semiconductor (since it is an n-type semiconductor contribution of holes is ignored) is close to: **JEE 2019**

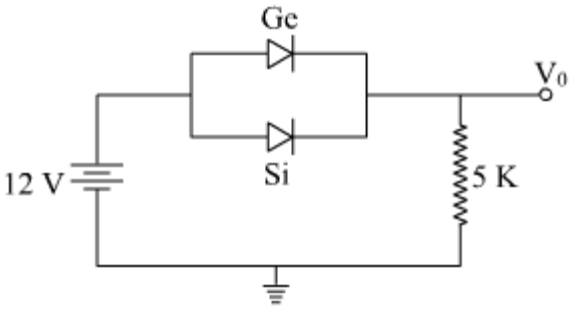
A. 2 Ωm

B. 4 Ωm

C. 0.4 Ωm

D. 0.2 Ωm

Q.No.10: Ge and Si diodes start conducting at 0.3 V and 0.7 V respectively. In the following figure if Ge diode connection are reversed, the value of V_0 changes by: (assume that the Ge diode has large breakdown voltage)



A. 0.8 V
B. 0.6 V
C. 0.2 V
D. 0.4 V