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**Question Paper Code : 50431**

B.E./B.Tech./B.Arch. DEGREE EXAMINATION,  
NOVEMBER/DECEMBER 2017

Second Semester

Electronics and Communication Engineering

EC6201 – ELECTRONIC DEVICES

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. State the difference between drift and diffusion current densities.
2. Calculate the built in potential barrier in a pn junction diode having following specification :  $T = 300\text{ K}$ ,  $N_a = 10^{18}\text{ cm}^{-3}$ ,  $N_d = 10^{15}\text{ cm}^{-3}$  and  $n_i = 1.5 \times 10^{10}\text{ cm}^{-3}$ .
3. Define Early effect.
4. State the reason behind the popularity of Common Emitter Configuration of BJT.
5. State the difference between BJT and FET.
6. Calculate the *Pinchoff voltage* of an *n-channel JFET* having following specification :  $T = 300\text{ K}$ ,  $N_a = 10^{18}\text{ cm}^{-3}$ ,  $N_d = 10^{16}\text{ cm}^{-3}$  and metallurgical channel thickness  $a = 0.75\ \mu\text{m}$ .
7. Define Snell's law.
8. State the significance of MOSFET devices.
9. State the difference between DIAC and TRIAC.
10. Define conversion efficiency of solar cell.

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PART – B

(5×16=80 Marks)

11. a) With the help of space charge width parameter, explain the behavior of PN junction diode when Forward Biased and Reverse Biased and derive the diode current equation.

(OR)

- b) Discuss the switching characteristics of PN diode with suitable application.

12. a) Discuss the three different configurations of BJT along with its characteristics and also highlight the impact of Base width modulation.

(OR)

- b) Analyze the two different functionality of BJT with appropriate equivalent circuit models.

13. a) "Field Effect Transistor is a voltage controlled current device" - justify the statement by describing the characteristics of the device involving the impact various parameters such as pinch off voltage, source drain voltage and gate source voltage.

(OR)

- b) With relevant sketches, explain the working mechanisms of enhancement and depletion MOSFET.

14. a) Narrate your understanding on various two terminal devices such as Schottky barrier diode, Zener diode, Tunnel diode and Varactor diode.

(OR)

- b) With relevant sketches, explain the working mechanisms of Gallium Arsenic device and LDR.

15. a) Discuss characteristics of Silicon Controlled Rectifier, also with neat circuit explain how it can be used as Battery charging regulator and temperature controller.

(OR)

- b) Explain your understanding on various pnpn devices such as Photo Transistor, Opto-Coupler, Solar cell and CCD.