

**I B.Tech-II Semester-Regular Examinations - July 2014**

**ELECTRONIC DEVICES AND CIRCUITS**  
**(Electronics & Communication Engineering)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Explain the formation of depletion region in an open-circuited P-N junction with neat sketches. 7 M
  
- b) Find static and dynamic resistance of P-N junction germanium diode if temperature is 27 °C and saturation current is 1 A for an applied forward voltage of 0.2 V. 7 M
  
2. a) Draw the volt-ampere characteristics of tunnel diode. Explain the characteristic on the basis of tunneling theory. 8 M
  
- b) Write a short note on 6 M
  - i) Varactor diode
  - ii) Zener diode
  - iii) Avalanche diode.
  
3. a) Obtain the expression for ripple factor in the case of Full Wave Rectifier Circuit with Capacitor Filter. 7 M

- b) Draw and explain the operation of a bridge rectifier and also write advantages and disadvantages. 7 M
4. a) Describe the principle of working of LCD. What are the applications of LCDs? 8 M
- b) Write a short note on 6 M
- i) Photo resistor                      ii) Photo diode
5. a) Compare the input and output characteristics of BJT in the three configurations. 8 M
- b) A transistor is connected in CE configuration. Collector supply voltage  $V_{CC} = 10 \text{ V}$   $R_L = 800\Omega$ , voltage drop across  $R_L = 0.8 \text{ V}$  and  $\alpha = 0.98$ . What is base current? Also determine the collector –emitter voltage. 6 M
6. a) Draw the Collector to Base bias circuit and derive the expression for the stability factors. What are the limitations of this circuit? 7 M
- b) Explain the terms Bias Stabilization and Bias Compensation. 7 M
7. a) Qualitatively explain the static V-I characteristics of UJT. 7 M
- b) Explain the working of n-channel enhancement type MOSFET. Sketch its typical characteristics. 7 M

8. a) Find the values of drain to source voltage ( $V_{DS}$ ) and gate to source voltage ( $V_{GS}$ ) given that  $I_D=5\text{mA}$   $V_{DD}=10\text{V}$ ,  $R_D=1\text{k}\Omega$  and  $R_S=500\ \Omega$  . 7 M

b) Prove that the maximum rectification efficiency of a full wave rectifier is 81.2%. And also write the differences between half wave rectifier and full wave rectifier. 7 M