

B.Tech. (BTCSVI / BTECVI / BTELVI)

Term-End Examination

December, 2017

00559

BIEL-001 : BASICS OF ELECTRONICS ENGINEERING

Time : 3 hours

Maximum Marks : 70

Note : *Attempt any seven questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. (a) What is a p-n junction diode ? Explain the formation of depletion region in a p-n junction. 5
- (b) Explain the diffusion and drift currents for a p-n junction diode. 5
2. Explain the properties of conductors, semiconductors and insulators using energy band diagram. 10
3. (a) Explain the working of a voltage tripler and a quadrupler with neat diagram. 5
- (b) What is a phototransistor ? How does it differ from an ordinary transistor ? Give its standard symbol and characteristics. Write its main applications. 5

4. Explain the basic structure and mechanism of carrier flow in an n-p-n transistor. 10
5. (a) Explain the difference between enhancement and depletion type of MOSFETs with the help of I-V curve. 5
- (b) Explain the construction and operation of a UJT. 5
6. (a) What is Zener effect ? Explain the function of a zener diode and draw its characteristics. 5
- (b) Draw and explain the drain characteristics and transfer characteristics of a P-channel JFET. 5
7. Explain the working of a photodiode and a tunnel diode. 10
8. (a) How can a transistor be used as a switch and an amplifier ? 5
- (b) Derive the relation between alpha (α) and beta (β) of a transistor. 5
9. (a) Define ripple factor. Calculate the ripple factors for half wave and full wave rectifiers. 5
- (b) Explain the "Pinch off" and "Cut off" voltage related to FET. 5

10. Write short notes on any *two* of the following : $2 \times 5 = 10$

- (a) Varactor Diode
 - (b) Ebers-Moll Model of Transistor
 - (c) Drift and Diffusion Currents
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