

**B. TECH**  
**BTCSVI / BTECVI / BTELVI**

**Term-End Examination**

**December, 2013**

**BIEL-001 : BASICS OF ELECTRONICS  
ENGINEERING**

*Time : 3 Hours*

*Maximum Marks : 70*

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- Note :** (i) *Attempt any seven questions.*  
(ii) *Assume missing data if any.*  
(iii) *Use of scientific calculator is permitted.*
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1. (a) Sketch the energy-band diagram for : 6  
(i) an intrinsic  
(ii) an N-type  
(iii) a P-type semiconductor  
Indicate the positions of the Fermi, the donor and the acceptor levels.
- (b) Write the equation of continuity for 4  
electrons.
2. What is meant by the potential barrier across a 10  
P-N junction ? Discuss the behaviour of a P-N  
junction under forward and reverse biasing. State  
diode current equation.

3. Draw the V-I characteristics of tunnel diode. 10  
Briefly describe the mechanism of junction breakdown.

4. A Zener diode shunt regulator is shown in fig. (i). 10  
Determine

- (a) load voltage
- (b) voltage drop across series resistance
- (c) current through the diode.

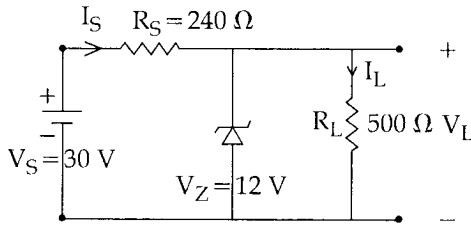


Fig. (i)

5. (a) What do you mean by Base-width modulation? 5

(b) For the Common Base circuit of fig. (ii) find the value of  $V_{CB}$ . Neglect junction voltage

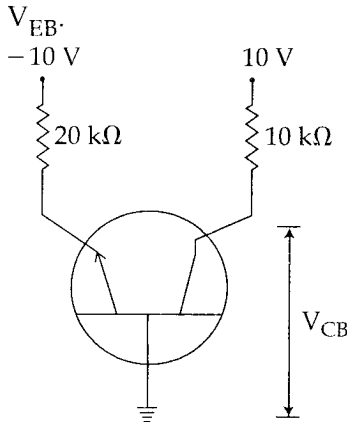


Fig. (ii)

6. (a) Draw the static drain characteristics and transfer characteristic curves for N-channel enhancement type MOSFET. 5
- (b) What are the reasons for forming the  $\text{SiO}_2$  layers in MOSFET ? 5
7. What are the advantages of FET over a conventional bipolar junction transistor ? Define pinch off voltage, transconductance, amplification factor and drain resistance of FET. 10
8. Explain switching time effect of a junction with suitable examples. 10
9. Compare Halfwave, Centre Tap and Bridge rectifier circuits. What is the advantage of each ? 10
10. Write short notes on *any two* : 2x5=10
- (a) PIN diode
- (b) UJT
- (c) Bleeder resistor

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