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BIEL-001

B.Tech. BTCSVI / BTECVI / BTELVI

Term-End Examination

00634

June, 2014

BIEL-001 : BASICS OF ELECTRONICS ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Each question carries equal marks.*

1. (a) How do energy levels in an atom transform to energy bands in a solid ? *5*

(b) How can you differentiate solids on the basis of energy band diagram ? *5*

2. (a) What is Fermi-level ? Draw the Fermi-energy band-diagram for conductors, semiconductors and metals. *5*

(b) Derive the continuity equation. *5*

3. Explain the working of a P-N junction diode under zero bias. Also explain the formation of barrier potential and depletion layer. *10*

4. (a) Draw the band structure or energy band diagram for a P-N junction under open-circuit conditions. *5*

(b) Explain the biassing of a P-N junction under forward and reverse bias. *5*

5. (a) Explain the difference between the Zener and the Avalanche diodes. *5*

(b) Explain the phenomenon of base-width Modulation/Early effect in transistors. *5*

6. Draw and explain the input and output characteristics of a BJT in common-emitter configuration and label the regions of operation clearly. *10*

7. (a) Define α and β for transistor and also derive the relation between them. *5*

(b) Briefly explain the construction and working of a unijunction transistor (UJT). *5*

8. Explain the construction and working of an n-channel JFET. Also draw the output and the transfer characteristics. Briefly explain the concept of pinch-off. *10*

9. (a) With neat circuit diagram briefly explain the working of a bridge-rectifier. *5*

(b) A diode whose internal resistance is 20 Ω is to supply power to a 1 kΩ load from a 110 V (rms) source of supply.

Calculate :

(i) Peak load current

(ii) DC load current

(iii) Peak inverse voltage *5*

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

(a) Varactor diode

(b) PIN diode

(c) Tunnel diode
