* K C - 6 2 4 7 *

# KC-6247

## B. E. II (Sem. III) (IT) Examination

### November/December – 2012

## Electronics - I

Time : **3** Hours] [Total Marks : **100**

**Instructions :**

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
**Fillup strictly the details of ☛ signs on your answer book.**

Name of the Examination :

☛ **B. E. II (Sem. III) (IT)**

Name of the Subject :

☛ **Electronics - I**

☛ Subject Code No. : **6 2 4 7** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Attempt all the questions.

(3) Figures to the right indicate marks.

(4) Assume necessary data whenever required.

(5) Scientific calculators Casio FX 82/83 and equivalent are allowed.

**1** (a) Do as directed : **10**

(i) Knee voltage for silicon diode is _____.

(ii) Ripple factor of a full wave rectifier is _____ and of a half wave rectifier is _____.

(iii) The majority carriers in N-type semiconductors are_____.

(iv) Zener diode is used as _____.

(v) Define : What is doping ?

(vi) Define : Forbidden Energy Gape.

(vii) When electron jumps from higher orbit to lower orbit, it _____.

(viii) In most transistors, the collector region is made physically_____ than the emitter region.

(ix) BJT stands for _____.

(x) The output resistance of a transistor is much _____ than its input resistance. (high, low)

(b) Explain P-type Semiconductor material with diagram. **4**

(c) Explain Transition Capacitance and Storage Capacitance of diode. **6**

**2** (a) Draw and explain full wave rectifier with LC filter with suitable waveforms. Also derive the equation for ripple factor. **8**

(b) Explain effect of infinite coupling capacitor in transistor amplifier. **7**

**OR**

**2** (a) Explain concept of dynamic resistance in diode. **7**

(b) Explain working of half wave rectifier and derive expression of output voltage, efficiency and ripple factor. **8**

**3** Write short notes : (any three) **15**

(i) Explain Schottky Diode

(ii) Explain Zener Diode

(iii) Compare CE, CC, CB transistor configuration

(iv) Explain N-type Semiconductor.

**4** (a) Answer the following : **10**

(i) Define biasing. Why biasing is needed ?

(ii) Define : Thermal run-away
Pinch off voltage

(iii) For 102 coding on a capacitor, its value is _____ pF.

(iv) Draw hybrid equivalent model of common emitter NPN-transistor.

(v) The equation of pinch off voltage of NMOS is _____.

(b) Explain the small signal analysis of CE configuration. **6**

(c) Differentiate enhancement and depletion type MOSFET. **4**

| | | | |
|---|---|---|---|
| **5** | (a) | Explain construction and working of enhancement type MOSFET. | **8** |
| | (b) | Write difference between BJT and FET. | **7** |

**OR**

| | | | |
|---|---|---|---|
| **5** | (a) | Explain effect of temperature on Q-point. | **8** |
| | (b) | Explain impedance reflection in h-parameters. | **7** |

**6** Write short notes on : (any three) **15**

(i) Temperature compensation using two diodes.

(ii) Phase splitter circuit using BJT.

(iii) Various steps of making monolithic IC

(iv) N-channel JFET.