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BEE-042

Diploma in Electrical and Mechanical Engineering

Term-End Examination 01082

December, 2011

BEE - 042 : ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *(i)* *Question No. **1** is **compulsory**.*

(ii) *Attempt **any four** questions from the remaining questions numbered **2 to 8**.*

(iii) *Use of scientific calculator is permitted.*

1. (a) Select the correct answer from the given four alternatives. **7x1=7**

(i) An ideal diode is two terminal device which offers _____ resistance to current flow.

(A) 10 ohms

(B) Zero ohm

(C) Infinite ohm

(D) 1 Ohm

(ii) Atoms are :

(A) positively charged

(B) negatively charged

(C) electrically neutral

(D) none of the above

(iii) In a Bipolar Junction Transistor (BJT), which of the following is heavily doped ?

(A) Collector

(B) Emitter

(C) Base

(D) Base and collector both.

(iv) In cut - off region :

(A) Emitter-base junction is forward biased and base collector junction is reverse biased.

(B) Emitter-base junction is reverse biased and base collector junction is forward biased.

(C) Emitter-base junction is forward biased and base collector junction is forward biased.

(D) Emitter-base junction is reverse biased and base-collector junction is reverse biased.

(v) Unijunction transistor has :

(A) Anode, cathode and gate

(B) Two bases and one emitter

(C) Two emitters and one base

(D) Source, Drain and gate.

(vi) The problem of race condition comes in :

(A) R S Flip-Flop

(B) J K Flip-Flop

(C) T-Flip-Flop

(D) None of the above

(vii) Avalanche breakdown is primarily dependent on the phenomenon of :

(A) collision

(B) doping

(C) ionization

(D) recombination

(b) Indicate ***True*** or ***False*** : **7x1=7**

(i) Passive transducers are self generating type of transducer.

(ii) In AM, the amplitude of the carrier signal is held constant.

(iii) In UJT, emitter is heavily doped.

(iv) Triac is a bilateral device.

(v) semiconductor has a negative temperature coefficient

(vi) In Bridge rectifier peak inverse voltage is 2Vm

(vii) Electron in conduction band has higher energy than in valence band

2. (a) Explain the block diagram of C.R.O. 7

(b) Explain the concept of Ramp type digital voltmeter. 7

3. (a) Explain the block diagram of digital frequency meter. 7

(b) Explain the construction and applications of UJT. 7

4. (a) Define and classify the different type of transducers. 7

(b) Explain the construction and working of SCR. 7

5. (a) With the help of logic diagram. Explain the full subtractor. 7

(b) (i) Convert $(100110)_2$ into octal number 7

(ii) Convert $(2570)_{10}$ into hexadecimal number

6. (a) What is Load line and Q-point ? Explain with the help of neat and clean diagram. 7

(b) Explain the construction and working principle of NPN type Bipolar Junction Transistor (BJT). 7

7. (a) Explain the capacitor filter with full wave rectifier, draw circuit diagram and waveforms. 7

(b) Explain ripple factor, derive mathematical expression for ripple factor of half wave and full wave rectifiers. 7

8. Write short notes on ***any two*** of the following : **2x7=14**

(a) Avalanche and zener breakdown

(b) Intrinsic and extrinsic semiconductor

(c) Piezoelectric transducer

(d) Thermocouple and Thermistor.