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BEE-042

01305

Diploma in Electrical and Mechanical Engineering

Term-End Examination

December, 2010

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 calculator is permitted.*

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1. (A) Select the correct answer from the given *Four* alternatives. **7x1=7**

(i) The region between conduction bond and valence bond is known as:

(a) Faraday's region.

(b) Crooke's gap.

(c) Forbidden gap.

(d) Fermi gap.

(ii) In a reverse bias mode, a diode offers:

(a) very high capacitance.

(b) very high resistance.

(c) very low resistance.

(d) very low Inductance.

(iii) The efficiency of a full wave rectifier is :

(a) 81.2% (b) 40.6%

(c) 20.3% (d) 90.6%

(iv) In a common emitter configuration of a transistor we get :

(a) low power gain.

(b) unity power gain.

(c) zero power gain.

(d) high power gain.

(v) Current gain for a transistor in common base confriguration is :

(a) just less than 1

(b) just greater than 1

(c) much lesser than 1

(d) much greater than 1

(vi) Decimal equivalent of 0.1011 is :

(a) 0.5875 (b) 0.6875

(c) 0.6855 (d) 0.5855

(vii) Full form of I.C. is :

(a) incorporated circuits.

(b) interfaced circuits.

(c) integrated circuits.

(d) interlinked circuits.

(B) State 'true' or 'false' for the given statements. **7x1=7**

(i) An SCR has an advantage of high switching speed over electromagnetic relay.

(ii) A series wound DC motor can not exert a high starting torque.

(iii) Multi channel displaying capacity is possible in dual beam oscilloscope.

(iv) There is very high electric field in the depletion layer of a p-n junction

(v) In a common base amplifier the output signal is 180° out of phase with the input signal.

(vi) When a diode is forward biased its thickness of depletion layer is decreased.

(vii) Phosphorus is an example of a donor type impurity for doping in semiconductors.

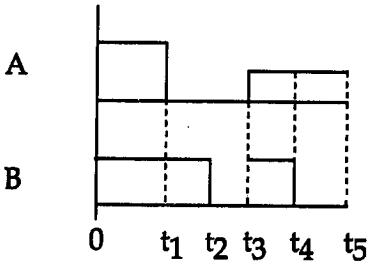
2. (a) Explain the working of Half wave rectifier clearly showing its output & input waveforms. 7

(b) What is a Zener diode ? Draw its VI Charcteristics. 7

3. (a) Let α = 0.99 For a BJT. Detrmine its β. 7
For the same transistor if the emitter current is 1 milliampere , determine the base and collector currents.

(b) Draw the input and output characteristics of an amplifier in common emitter mode. 7

4. (a) The following two waveforms are fed to the two inputs of the NAND gate. Draw the output waveform: 7



(b) How can you make a AND gate using 'OR' gates only ? Explain it. 7

5. (a) Explain the working principle of DC motor as an actuator. 7

(b) Discuss single phase AC motor as an actuator. 7

6. Discuss SCR with clearly explaining its voltage current characteristics, & voltage safety factor. 14

7. With the help of a diagram explain the working of a monochromatic television transmitter circuit. 14

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

(a) Function elements of a generalised measuring system .

(b) LVDT.

(c) Turbine flow meter.

(d) Optical transducer.

(e) PLC and its applications.