01292

Diploma in Electrical and Mechanical Engineering

Term-End Examination

June, 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 calculator is permitted.

1. (a) State '***True***' or '***False***' against the following statements. **7x1=7**

(i) X - Y plotter can be used to record speed torque characteristics of a motor.

(ii) Turbine flow meter can be compensated for viscosity variation.

(iii) UJT exhibit a negative resistance characteristics and so it can be employed as an oscillator.

(iv) It is not possible to make NAND gate using 'OR' gates only.

(v) Doping increases the conductivity of a semiconductor.

(vi) To operate a transistor its emitter should be forward biased and base should be reverse biased.

(vii) A NOT gate can be realized using diodes.

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

(i) In a semiconductor the energy gap between the valence band and conduction band is nearly :

(A) 5 ev (B) 1 ev

(C) 3.5 ev (D) 4 ev

(ii) To use a Zener diode as regulator it should be :

(A) forward biased

(B) reverse biased

(C) either forward or reverse biased

(D) it can not be used to regulate voltage supply

(iii) The modulated signal in transmission has the frequency of :

(A) baseband signal

(B) carrier wave

(C) double of carrier wave frequency

(D) half the frequency of base band signal

(iv) A semiconductor containing trivalent impurity is :

(A) P type semiconductor

(B) N type semiconductor

(C) NPN type semiconductor

(D) PNP type semiconductor

(v) The gate whose output is low if and only if all the input are high is :

(A) NAND (B) NOR

(C) OR (D) AND

(vi) Hexa decimal equivalent of $(5390)_{10}$ is :

(A) $(145\ C)_{16}$

(B) $(155\ B)_{16}$

(C) $(152\ D)_{16}$

(D) $(150\ E)_{16}$

(vii) A diode can not be used as a :

(A) Half wave rectifier

(B) Full wave rectifier

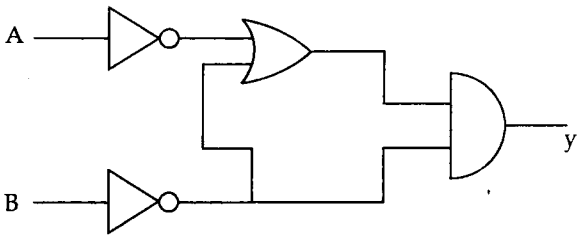
(C) Constant voltage dc supply

(D) Oscillator

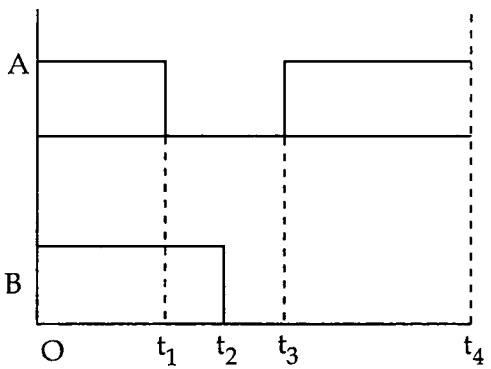
2. Explain the various components of a CRO with a neat functional diagram. Also discuss its applications. **14**

3. Draw and explain the working of digital frequency meter with the help of a block diagram. **14**

4. (a) Write the truth table for the given digital circuit. 7



(b) Two digital inputs A and B are fed to 'OR' gate. Draw the output waveform : 7



5. (a) Two amplifiers are connected one after the other in series cascading. The first amplifier has a voltage gain of 10 and the second has voltage gain of 20. If the input signal is 0.01 volt, calculate the output dc voltage. 7

(b) Explain enhancement MOSFET with the help of a diagram. 7

6. Explain the working of a Triac with the help of proper diagrams and characteristics. Discuss its application also. **14**

7. Discuss the various concepts used in selection of Instruments. Also discuss static performance parameter and dynamic performance parameters. **14**

8. Write short notes on ***any two*** of the following. **7x2=14**

   (a) Eddy current transducers

   (b) AC Techo generator

   (c) Recording devices

   (d) High frequency measurements

   (e) DC motor as actuator