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**Diploma in Electrical and Mechanical
Engineering**

Term-End Examination

June, 2010

BEE - 042 : ELECTRONICS

Time : 2 hours

Maximum Marks : 70

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- Note :** (i) *Question no. 1 is compulsory.*
(ii) *Attempt any four questions of the remaining questions numbered 2 to 8.*
(iii) *Each question carries equal marks.*
(iv) *Use of calculator is permitted.*
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1. (a) State *True* or *False* for the given statements : 7x1=7
- (i) Mass of the electron is 1.6×10^{-19} kg.
 - (ii) An Inductor Filter is used only with relatively high load currents.
 - (iii) In a transistor, base has minimum doping level.
 - (iv) Hydrometer is a device to measure the rate of flow of milk.
 - (v) NAND gate is a universal gate.
 - (vi) An N type semiconductor is a negatively charged semiconductor.
 - (vii) Germanium diode has higher knee voltage as compared to silicon diode.

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

(i) In full wave rectifier, if the input frequency is 50 Hz, the output frequency is :

- (A) 50 Hz (B) 100 Hz
(C) 200 Hz (D) 25 Hz

(ii) Which type of wires are used to form the thermocouple to avoid temperature gradient ?

- (A) Homogeneous
(B) Non homogeneous
(C) Both (A) and (B)
(D) None of the above

(iii) Which of the following is a displacement sensing transducer ?

- (A) LVDT
(B) Variable capacitor
(C) Both (A) and (B)
(D) None of the above

(iv) Fan out of TTL logic is :

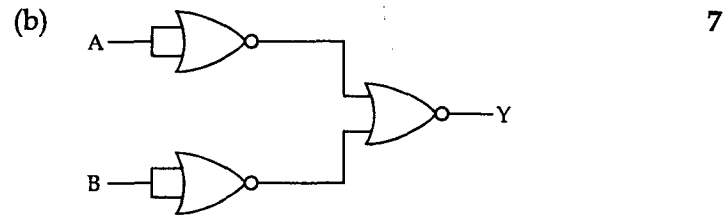
- (A) 40 (B) 50
(C) 70 (D) 10

- (v) Which of the following region is not used when a transistor operates as a switch :
- (A) Cut off region
 - (B) Active region
 - (C) Saturation region
 - (D) Transistor can never operate as a switch
- (vi) Seismic mass is used to measure :
- (A) mass (B) velocity
 - (C) density (D) acceleration
- (vii) One kWh of energy is equal to :
- (A) 1.8×10^5 joules
 - (B) 3.6×10^5 joules
 - (C) 36×10^5 joules
 - (D) 0.36×10^5 joules

2. (a) An a.c. supply of 230 volt is applied to the primary of a transformer. The transformer has turn ratio of 12 : 1. Neglect the diode resistance and transformer resistance. Calculate : 7
- (i) V_{dc}
 - (ii) PIV
- in a full wave centre tap rectifier.
- (b) Draw the forward bias characteristic and reverse bias characteristic of a diode. 7

3. (a) Clearly explain the Load line and Q-point for a given transistor. 7
- (b) Explain the functioning of an FET transistor as an amplifier. 7
4. (a) With the help of a block diagram explain the functional elements of a generalised measuring system. 7
- (b) What is the function of an actuator ? Classify actuators with one example of each type. 7
5. (a) Write down the important specifications of TTL logic family. 7
- (b) Draw the schematic diagram of LVDT and explain briefly its characteristics. 7
6. (a) With neat sketch, explain the construction and working of CRT. 7
- (b) Discuss the use of thermistors in temperature measurement. 7

7. (a) How can you compare two frequencies using Lissajous figures ? 7



Obtain the truth table for the given digital logic circuit.

8. Write short notes on *any four* of the following :

4x3½=14

- (a) Applications of UJT.
- (b) Semi conducting materials.
- (c) Zener diode.
- (d) Advantage of bridge rectifier.
- (e) NAND gate.
- (f) Measurement of reactive power.
- (g) Advantages of Doping in semiconductor.
