

**Diploma in Electrical and Mechanical  
Engineering****Term-End Examination****June, 2008****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.
  - (iii) Use of calculator is permitted.
  - (iv) All questions carry equal marks.
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**1. State True or False for the following : 14×1=14**

- (i) Majority charge carriers in a P-type semiconductor are electrons.
- (ii) The recording of two variables, one against another can be achieved using X - Y recorders.
- (iii) Total radiation pyrometer is used to measure pressure.

- (iv) 'Rochelle Salt' is an example of natural piezoelectric substance.
- (v) A Unijunction transistor is also called the double base diode.
- (vi) Internal power losses in a thyristor are much greater than those in a transistor.
- (vii) NAND gate can be considered as a universal gate.
- (viii) Boolean expression for an 'OR' gate is  $A+B$ .
- (ix) Doping level of base region is small as compared to that of emitter and collector in a transistor in order to have higher gains.
- (x) The function of a transmitter is to generate audio waves for transmission into space.
- (xi) Synchronous motors are self-starting.
- (xii) Compound d.c. motor has high starting torque and good speed regulation.
- (xiii) A galvanometer type of recorder has a low input impedance and a limited sensitivity.
- (xiv) Inductor in a d.c. circuit is also known as a delay element.

2. (a) With the help of a diagram explain the construction and working of a single phase energy meter. 7
- (b) Explain in brief the working of capacitor filter. 7

3. (a) How are transducers classified ? Give any five examples of application of transducers. 7
- (b) How can the flow measurement be performed using Turbine flow meter ? 7
4. (a) Explain the working of NPN transistor as an amplifier used in common emitter mode. 7
- (b) Draw the characteristics of a zener diode and explain its use in making constant voltage d.c. supply. 7
5. (a) Using suitable block diagrams, briefly explain the monochrome television receiver circuit. 10
- (b) Draw the circuit diagram for a typical photo emissive cell. 4
6. (a) A thermocouple uses a galvanometer which gives deflection for a minimum potential difference of  $100 \mu\text{V}$ . The rating of thermocouple is  $25 \mu\text{V}/^\circ\text{C}$ . What is the minimum temperature difference required across the two junctions of the thermocouple to show deflection in the galvanometer ? 7
- (b) Discuss the characteristics and construction of a SCR. 7
7. (a) Draw the circuit and symbol of JK Master Slave flip-flop, with truth table. 7
- (b) Give the circuit diagram and symbol of 'Exclusively OR' gate and obtain its truth table and boolean expression. 7

8. Write short notes on any *four* of the following :  $4 \times 3 \frac{1}{2} = 14$

- (a) Microprocessor
- (b) Eddy current transducer
- (c) Lissajous Figures
- (d) Rectifiers
- (e) Field Effect Transistor
- (f) Semi-conducting materials
- (g) Automatic Voltage Regulator