

**DIPLOMA IN MECHANICAL ENGINEERING  
(DME)**

**Term-End Examination**

**June, 2016**

01000

**BEE-042 : ELECTRONICS**

*Time : 2 hours*

*Maximum Marks : 70*

---

**Note :** *Question no. 1 is compulsory. Attempt any four questions from the remaining questions. Use of scientific calculator is permitted.*

---

---

1. (a) Select the correct answer from the given options.  $7 \times 1 = 7$

(i) Avalanche breakdown in a diode occurs when

(1) forward current exceeds a certain value

(2) reverse bias crosses a certain value

(3) depletion layer becomes more wide

(4) None of these

- (ii) To obtain a p-type semiconductor, the impurity added to a pure semiconductor is
- (1) pentavalent
  - (2) tetravalent
  - (3) trivalent
  - (4) None of these
- (iii) When transistors are used as a switch, they usually operate in the
- (1) active region
  - (2) breakdown region
  - (3) linear region
  - (4) saturation and cut-off region
- (iv) DC current gain in common emitter configuration is
- (1)  $I_C / I_E$
  - (2)  $I_E / I_B$
  - (3)  $I_B / I_E$
  - (4)  $I_C / I_B$
- (v) Base of Binary Number system is
- (1) 8
  - (2) 2
  - (3) 16
  - (4) 6

(vi) Ratio of latching current to holding current in SCR is

- (1) less than one
- (2) more than one
- (3) equal to one
- (4) less than or equal to one

(vii)  $I_{DSS}$  can be defined as

- (1) the minimum possible drawn current
- (2) the maximum possible current with  $V_{GS}$  held at  $-6$  volt
- (3) the maximum possible current with  $V_{GS}$  held at  $0$  volt
- (4) None of these

(b) State *true* or *false* against the given statements.

7×1=7

- (i) At absolute zero temperature, the conduction band of a semiconductor is totally empty.
- (ii) Electric field inside the depletion layer is very high of the order  $10^5$  volts per metre.
- (iii) Common Base configuration has very high input impedance.
- (iv) For half wave rectifier, ripple factor is  $81.2\%$ .

- (v) A zener diode is operated in the breakdown region.
  - (vi) In UJT, the emitter is lightly doped.
  - (vii) Strain gauge is an active transducer.
2. (a) Explain the working of an electrical humidity transducer. 7
  - (b) What are the various techniques used in a Digital Voltmeter ? Discuss Ramp type DVM. 7
  3. (a) Explain the block diagram of C.R.O. 7
  - (b) How does digital frequency meter work ? Discuss with a block diagram. 7
  4. (a) Explain the circuit of a full subtractor. 7
  - (b) Discuss the working of RS Flip-Flop. 7
  5. (a) What is Scanning ? How is it done in T.V. ? 7
  - (b) Explain the working of superheterodyne receiver. 7
  6. (a) Discuss the working of a bridge rectifier. What is ripple factor ? 7
  - (b) Explain the working of a capacitor filter with the help of a waveform. 7

7. (a) Explain the construction and working of UJT. 7
- (b) Explain the working of zener diode as regulated power supply. 7
8. Write short notes on any *two* of the following :  $2 \times 7 = 14$
- (a) Synchronous Motor
  - (b) Piezoelectric Transducer
  - (c) SCR
  - (d) Thermistor
-