

**DIPLOMA IN ELECTRICAL AND MECHANICAL  
ENGINEERING (DEME)**

00265

**Term-End Examination**

**December, 2014**

**BEE-042 : ELECTRONICS**

*Time : 2 hours*

*Maximum Marks : 70*

---

**Note :** *Question no. 1 is compulsory. Attempt any four questions of the remaining questions numbered 2 to 8.*

---

---

1. Select the correct answer from the given four alternatives :  $14 \times 1 = 14$

- (i) Zener diode is used as
- (a) Rectifier
  - (b) Voltage regulator
  - (c) Stabilizer
  - (d) Constant voltage source

(ii) Ripple factor of capacitor filter is given by

(a)  $\frac{1}{4\sqrt{3FR_L C}}$

(b)  $\frac{R_L}{3\sqrt{2\omega L}}$

(c)  $\frac{1}{2\sqrt{3FR_L C}}$

(d)  $\frac{1}{6\sqrt{2\omega^2 LC}}$

(iii) In the half-wave rectifier, bidirectional sinusoidal signal is converted into

- (a) Bidirectional waveform
- (b) Unidirectional waveform
- (c) Proper AC
- (d) Proper DC

(iv) If a p-n junction is forward biased, its resistance is

- (a) Very large
- (b) Infinite
- (c) Zero
- (d) Very small

(v) In a semiconductor, the energy gap between valence band and conduction band is nearly

- (a) 5 eV
- (b) 1 eV
- (c) 3 eV
- (d) 0.5 eV

(vi) CRO displays

- (a) Voltage waveform
- (b) Current waveform
- (c) Phasor diagram
- (d) All of the above

(vii) If  $I_B = 50 \text{ mA}$  and  $I_C = 36.5 \text{ mA}$ , value of current gain in common emitter is

- (a) 1
- (b) 1.2
- (c) 0.986
- (d) 0.73

(viii) Which one is the pressure sensing element ?

- (a) Bourdon tube
- (b) Diaphragm
- (c) Both (a) and (b)
- (d) None of the above

- (ix) BJT acts as an amplifier in
  - (a) Cut-off region
  - (b) Active region
  - (c) Saturation region
  - (d) Reverse
  
- (x) Transistors act as ohmic resistors in
  - (a) Cut-off region
  - (b) Saturation region
  - (c) Active region
  - (d) Breakdown region
  
- (xi) State two logic families that use negative power supply.
  - (a) TTL and ECL
  - (b) TTL and MOS
  - (c) ECL and MOS
  - (d) CMOS and ECL
  
- (xii) Which of the following is a sequential circuit :
  - (a) Flip Flop
  - (b) Counter
  - (c) Shift register
  - (d) All of the above

(xiii) Which logic family is used for industrial purpose ?

- (a) RTL
- (b) TTL
- (c) DTL
- (d) ECL

(xiv) Televisions have \_\_\_\_\_ scanning lines.

- (a) 625
- (b) 312
- (c) 3125
- (d) 626

2. (a) Explain the behaviour of p-n junction under forward and reverse bias. 7

(b) What is Zener diode ? Explain the VI characteristic of Zener diode. 7

3. (a) An a.c. supply of 230 V is applied to the primary of the transformer. The transformer has turns ratio of 12 : 1. Neglect the diode resistance and transformer resistance.

Calculate

- (i)  $V_{dc}$
- (ii) PIV. 6

(b) Draw and explain the input-output characteristics of NPN transistor in CE configuration. In which region is the collector dissipation maximum ? 8

4. (a) Explain with a neat sketch, the operation of PNP transistor in active region. 6
- (b) With a block diagram, explain the functional elements of generalized measuring system. 8
5. (a) Draw and explain the working of a digital frequency meter with the help of a block diagram. 7
- (b) Describe the transducers with their classification. 7
6. (a) What is a UJT ? Explain how UJT works as a Relaxation Oscillator. 7
- (b) Draw the block diagram of an automatic control system. 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 *two* of the following :

$2 \times 7 = 14$

- (a) Clamper
  - (b) Transistor as an amplifier
  - (c) Bridge rectifier
  - (d) Accuracy and precision of measuring instruments
  - (e) LVDT
-