[3661]-109

F. E. (Semester - II) Examination - 2009
BASIC ELECTRONICS ENGINEERING
(June 2008 Pattern)

Time : 3 Hours]   [Max. Marks : 100

Instructions :

    *(1) Answer **any three** questions from **each** section.*

    *(2) Answers to the **two** sections should be written in **separate** answer-books.*

    (3) Black figures to the right indicate full marks.

    (4) Use of electronic pocket calculator is allowed.

    (5) Assume suitable data, if necessary.

SECTION - I

Q.1) (A) A Bridge Rectifier is applied with input from step-down transformer having turns ratio 8 : 1 at 230V, 50Hz. If the diode forward resistance is 1Ω, secondary resistance is 10Ω and load resistance connected is 2kΩ. Find –

    (1) DC Power Output

    (2) PIV of each diode

    (3) % efficiency

    (4) Regulation at full load   **[08]**

  (B) Describe with the help of neat circuit diagram the operation of Zener Voltage Regulator.   **[06]**

  (C) Explain the concept of Multiplexed Display.   **[04]**

OR

Q.2) (A) Explain the principle of operation of LED. State various material used to Fabricate LED. **[04]**

(B) Design zener regulator for following specifications :

V_o = 5V, I_L = 20 mA, Pz = 500 mW, V_i = 12 ± 2V, Iz (min) = 8 mA. **[08]**

(C) Give comparison between Half Wave, Full Wave and Bridge Rectifier. **[06]**

Q.3) (A) Determine I_B, I_C, I_E, V_{CE} in the circuit of fig. 1 The Transistor has a β = 150. Assume V_{BE} = 0.7V. **[06]**
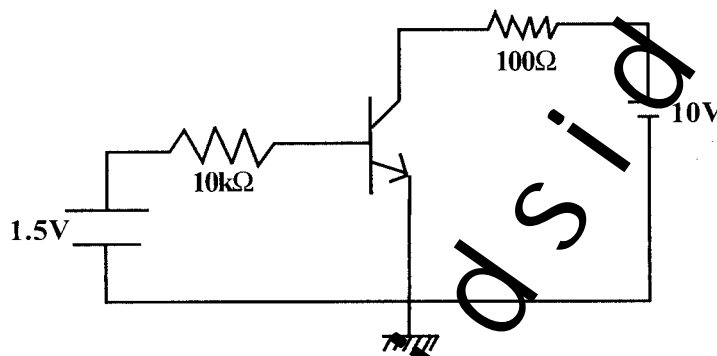
Fig. 1

(B) Explain the construction, working and V-I characteristics of SCR. **[06]**

(C) Define the following terms : **[04]**

(1) Pinch Off Voltage

(2) Gate Cutoff Voltage

OR

Q.4) (A) Sketch and explain the typical BJT common base input, output and transfer characteristics. **[06]**

(B) If the midband gain of an amplifier is 100 and if the half power frequencies are F_L = 40Hz and F_H = 16 kHz.
Calculate the amplifier gain the at the frequencies of 20Hz and 20 kHz. **[06]**

(C) Explain construction and working of enhancement MOSFET. **[04]**

Q.5) **(A)** (a) Explain the following ideal characteristics of OP-Amp :

(1) CMRR

(2) Slew Rate

(3) Band Width

(b) Why is it necessary to reduce the gain of OP-Amp from its open loop value ? **[08]**

(B) Draw and explain the working of square wave generator using OP-Amp. **[08]**

OR

Q.6) **(A)** Draw and explain the circuit diagram for obtaining $V_0 = V_1 + V_2$. Derive the equation. **[08]**

(B) Explain following application of OP-Amp : **[08]**

(1) Integrator

(2) Differentiator

Give area of applications of these circuits.

SECTION - II

Q.7) **(A)** Design and implement Full Adder Circuit. **[06]**

(B) What do you mean by Shift Resistor ? Explain different types of Shift Resistor. **[06]**

(C) What are the advantages of using Microprocessor and Microcontrollers ? **[04]**

OR

Q.8) **(A)** Use DeMorgan's Theorm to simplify following Boolean expressions :

(1) $\overline{\overline{AB} + \overline{A}\overline{B}}$

(2) $\overline{(A + \overline{B})(C + \overline{D})}$ **[06]**

(B) Draw and explain D Flip-Flop. Give the applications of Flip-Flops. **[06]**

(C) Draw the diagram of 1 : 8 demultiplexer. What is the relation between number of select lines and outputs ? **[04]**

Q.9) (A) Write short note on CNC Machine. [04]

(B) Draw a block diagram of Electronic Weighing Mahine and explain its operation. [06]

(C) Draw and explain different temperature transducers with its advantages and disadvantages. [06]

OR

Q.10) (A) Write short note on : [06]

(1) PLC

(2) Alarm Anqunciator

(B) Draw and explain different types of Pressure Transducers. [08]

(C) Differenciate between Active and Passive Transducer. [02]

Q.11) (A) Draw and explain Electromagnetic Spectrum. [08]

(B) Explain basic concept of SuperHeterodying. [04]

(C) Write short note on : [06]

(1) Wireless Communication Media

(2) Twisted Wire Cables

OR

Q.12) (A) What is the concept of Phase Modulation ? [04]

(B) Explain following thing about FM : [08]

(1) Deviation Ratio

(2) Mathematical Representation of FM

(3) Advantages and disadvantages of FM.

(4) Effect of Modulation Index in FM.

(C) Draw the block diagram of basic Communication System. Explain each block in detail. [06]