Total No. of Questions : 6] [Total No. of Printed Pages : 4

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F. E. (Semester - II) Examination - 2010

BASIC ELECTRONICS ENGINEERING

(2008 Pattern)

Time : 2 Hours] **[Max. Marks : 50**

Instructions :

(1) Answers should be written in one answer book.

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

(3) Neat diagrams must be drawn wherever necessary.

(4) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

(5) Assume suitable data, if necessary.

Q.1) (A) (a) Explain with diagram and graphs, way of Biasing of P-N Junction Diode. Also write Volt-Ampere Equation of P-N Junction Diode. **[05]**

(b) A diode, whose internal resistance is 20 ohms, is to supply power to 1000 ohms load from a 110V rms source of supply. Calculate :

(i) Peak Load Current

(ii) DC Load Current

(iii) AC Load Current

(iv) DC Load Voltage **[04]**

(B) (a) Draw output characteristics of BJT in CE Configuraton. Indicate all the three regions of operation on it. Explain operation of BJT as a switch. **[05]**

(b) Explain constructional details and V-1 Characteristics of SCR. **[04]**

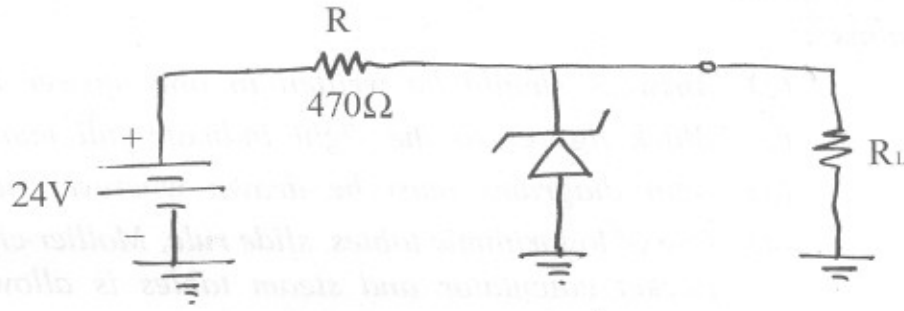
OR

Q.2) (A) (a) Determine minimum and maximum load currents for which the Zener Diode in figure 1 will maintain regulation. What is the minimum R_1 that can be used ?

Given :

$V_Z = 12V$, $I_{Zk} = 1mA$, $I_{Zm} = 50mA$.

Assume $Zz = 0\Omega$ over the range of current values. **[06]**



(b) Give advantages of Multiplexed Display. **[03]**

(B) (a) Sketch JFET Drain and Transfer Characteristics and indicate following parameters : **[05]**

(i) Pinch-Off Voltage

(ii) Drain Self Saturating Current

(iii) $V_{GS(OFF)}$

(iv) Regions of Operation

(b) What is β_{DC} of a BJT if Ic = 20.5mA and I_E = 20.3 mA ? What is α_{DC} if Ic = 5.35mA and I_B = 50 μA ? **[04]**

Q.3) (A) (a) Draw and explain functional block diagram of Operational Amplifier. **[04]**

(b) In the Non-inverting Summing Amplifier $V_1 = 2V$, $V_2 = 4V$, $V_3 = 5V$, input resistors for all three input signals are the same and are equal to 1kΩ. The feedback resistor R_f is 2kΩ. Determine output voltage. **[04]**

(B) (a) Draw neat circuit diagram of CMOS NAND gate and explain its operation with truth table. **[04]**

(b) What is Multiplexer ? What is the relation between number of select lines and inputs ? Draw diagram of 4 : 1 MUX and explain significance of STROBE pin ? Give application of Multiplexers. **[04]**

OR

Q.4) (A) (a) Define and give typical values of the following Op-Amp parameters : **[04]**

(i) Voltage Gain

(ii) CMRR

(iii) Input Offset Voltage

(iv) Slew Rate

(b) Draw neat circuit of Square Wave Generator using Op-Amp and explain its operation. **[04]**

(B) (a) Prove the following using DeMorgan's Theorem : **[04]**

(i) $AB + CD = \overline{AB} \cdot \overline{CD}$

(ii) $\overline{(A+B) \cdot (C+D)} = (\overline{A} \cdot \overline{B}) + (\overline{C} \cdot \overline{D})$

(b) Give comparison between Micro-controller and Micro-processor. **[04]**

Q.5) (A) (a) What is RTD ? Draw its constructional diagram and explain its operation. **[04]**

(b) Draw block diagram and write a brief note on PID Controller. **[04]**

(B) (a) Write expression of AM ? Draw and explain Frequency Spectrum for AM. **[04]**

(b) Differentiate between AM and FM. **[04]**

OR

Q.6) (A) (a) Draw and explain Construction of a LVDT. Explain its principel of operation. State its applications. **[04]**

(b) Draw block diagram of PLC and explain function of each block. **[04]**

(B) (a) With the aid of block diagram explain Superheterodyne Receiver. **[04]**

(b) Write a short note on RG Standard of Cables. **[04]**
