

Total No. of Questions : 6]

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[3861]-162

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.

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- 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-I Characteristics of SCR. [04]

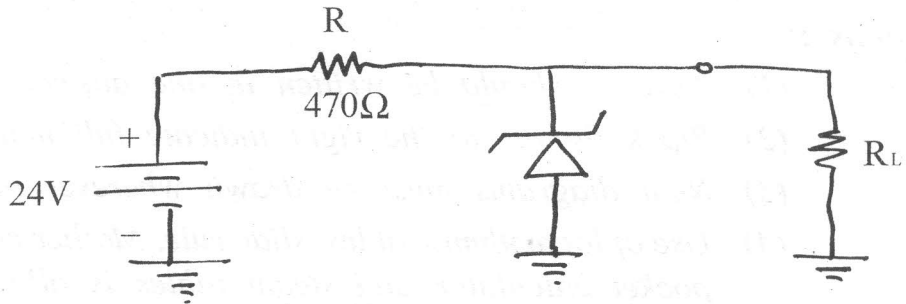
OR

- 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_L that can be used ?

Given :

$$V_Z = 12V, I_{ZK} = 1mA, I_{ZM} = 50mA.$$

Assume $Z_Z = 0\Omega$ 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 $I_C = 20.5mA$ and $I_E = 20.3mA$? What is α_{DC} if $I_C = 5.35mA$ and $I_B = 50 \mu A$? [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 $1k\Omega$. The feedback resistor R_f is $2k\Omega$. 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 principle 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]
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OR