

Total No. of Questions : 12]

[Total No. of Printed Pages : 4

[3761]-19

F. E. Examination - 2010

BASIC ELECTRONICS ENGINEERING

(2003 Course)

Time : 3 Hours]

[Max. Marks : 100

Instructions :

- (1) Answer **three** questions from section I and **three** questions from section II.
- (2) Answers to the **two sections** should be written in **separate books**.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Use of logarithmic table, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- (6) Assume suitable data, if necessary.

SECTION - I

- Q.1) (A) If $I_E = 12 \text{ mA}$, $I_B = 100 \mu\text{A}$. Calculate α and β . [06]
- (B) With neat circuit diagram and waveforms explain the Operation of Half Wave Rectifier. [06]
- (C) Differentiate between Zener Breakdown and Avalanche Breakdown. [06]

OR

Q.2) (A) A bridge rectifier is applied with input from a Stepdown Transformer having turns ratio 8 : 1 and input 230V, 50Hz. If the $R_f = 1\Omega$, $R_s = 10\Omega$ and $R_L = 2k\Omega$.

Find :

(1) D. C. Power Input

(2) PIV across each diode

(3) $\% \eta$ (efficiency)

[06]

(B) Draw construction diagram and explain working of n-p-n transistor with and without biasing.

[06]

(C) Write short notes on :

[06]

(1) Photodiode

(2) Varactor Diode

Q.3) (A) What is D.C. Load Line ? Give its significance and derive its equation for Common Emitter Amplifier.

[08]

(B) Draw and explain block diagram of Series Regulator.

[08]

OR

Q.4) (A) With the help of neat circuit diagram and input, output waveforms explain working of Single Stage R-C Coupled Amplifier.

[08]

(B) For the circuit shown in fig. 4(B) find the Maximum and Minimum Values of Zener Diode Current :

[08]

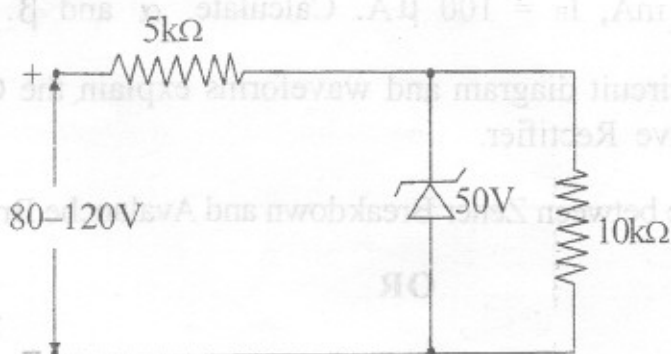


Fig. 4(B)

- Q.5) (A) State and prove DeMorgans Theorems. [08]
(B) Simplify the following expression and implement it by using NAND Gates only.

$$\overline{W}XY\overline{Z} + XY\overline{Z} + X\overline{Y}\overline{Z} + X\overline{Y}Z \quad [08]$$

OR

- Q.6) (A) Design and implement Full Adder using K-map. [08]
(B) Design One Bit Comparator using K-map and realize it using basic gates. [08]

SECTION - II

- Q.7) (A) Draw the circuit diagram of Inverting Amplifier and explain its working. Also derive expression for Closed Loop Gain. [08]
(B) Draw and explain the Operation of Wein Bridge Oscillator [08]

OR

- Q.8) (A) Explain following Op-Amp Parameters : [08]
(1) C.M.R.R.
(2) Input Offset Voltage
(3) Input Bias Current
(4) Slew Rate
(B) What is Difference Amplifier ? Draw its circuit diagram and derive the expression for output. [08]

- Q.9) (A) With the help of neat block diagram explain Instrumentation System. [08]
(B) On which Basic Principle Thermocouple Works. With neat diagram explain its operation. Also give its applications. [08]

OR

Q.10)(A) Explain following characteristics of Transducer : [08]

- (1) Precision
- (2) Hysteresis
- (3) Sensitivity
- (4) Linearity

(B) Write short note on Piezoelectric Transducer. [08]

Q.11)(A) Draw and explain block diagram of Single Channel C.R.O. [06]

(B) What is Multivibrator ? Draw the circuit diagram and explain the Operation of Astable Multivibrator using IC 555. [06]

(C) With neat block diagram explain Operation of Electronic Weighing Machine. [06]

OR

Q.12)(A) Explain following Front Panel Controls of C.R.O. : [06]

- (1) Alternate
- (2) Chop

(B) Write short notes on : [12]

- (1) Batch Counter
- (2) Burglar Alarm