Total No. of Questions : 12] [Total No. of Printed Pages : 4

[3561]-19

F. E. Examination - 2009

BASIC ELECTRONIC ENGINEERING

(2003 Course)

Time : 3 Hours] **[Max. Marks : 100**

Instructions :

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

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

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

(4) Neat diagrams must be drawn wherever necessary.

(5) Use of electronic pocket calculator is allowed.

(6) Assume suitable data, if necessary.

SECTION - I

Q.1) (A) A Fullwave Bridge Rectifier is supplied from 230V, 50 Hz and uses a transformer of turns ratio 15:1. It uses load resistance of 50Ω. Calculate Load Voltage and Ripple Voltage. Assume Standard Value of Ripple Factor and Ideal Diodes; Transformer. **[08]**

(B) Diffentiate between zener Breakdown and Avalanch Breakdown. **[04]**

(C) Explain different types of Biasing Circuits in a transistor with relevant circuit diagram. **[06]**

OR

Q.2) (A) Write short notes : **[06]**

(1) Photodiode

(2) Varacter Diade

(B) Give comparison of CE, CB, CC on the basis of : [04]

A_I ; Phase difference between input and output

Ri; Configurationwise Applications

(C) Explain the effect of temperature on p-n junction. Determine the forward current for a Germanium Diode at room temperature (27°C) when the voltage across it is (1) o.1V (2) 0.3V. Assume reverse saturation current of 1 nA. [08]

Q.3) (A) Calculate the Component Values in a zener Regulator to meet following specifications. [08]

$V_o = 8V$; $V_I = 30V$, $I_L = 50mA$

Assume $I_{z(min)} = 5mA$ and Pz = 1W.

(B) Draw and explain the block diagram of Series Regulator. [04]

(C) What is D.C. Load Line ? Give its significence and derive its equation for CE Amplifier. [04]

OR

Q.4) (A) Draw and explain the block schematic of a regulated power supply. What are the advantages of IC Regulators over descrete Componant Reglator Circuit. [08]

(B) For an amplifier the midband frequency gain is 50 and the lower half power frequency is 80Hz. Find out the gain of the amplifier at the lower half power frequency. [04]

(C) Explain the effect of Coupling; bypass and junctions capacitors on the frequency responce of an amplifier. [04]

Q.5) (A) Simplify the following expression and implement it by using NAND gates only.

$\overline{W}\ X\ Y\overline{Z} + XY\overline{Z} + X\overline{Y}\overline{Z} + X\overline{Y}Z$ [06]

(B) Design Half Adder circuit using K-map. [06]

(C) Explain Positive and Negative Logic in Digital Systems. [04]

OR

Q.6) (A) Prove the following using Boolean Algebric Theorm. **[08]**

(1) $\overline{A}BC + A\overline{B}C + AB\overline{C} + ABC = AB + BC + CA$

(2) $AB + \overline{A}C + BC = AB + \overline{A}C$

(B) Design one bit comparator using K-map and realize it using basic gates. **[06]**

(C) List Univeral Gates and Realize AND Operation uing NOR. **[02]**

SECTION - II

Q.7) (A) Draw the circuit diagram of Non-inverting Summing Amplifier with three inputs and derive the equation of output voltage. **[07]**

(B) State and explain Barkhausen Criteria. **[04]**

(C) Give Ideal Values of following OP-Amp Parametes : **[05]**

(1) Av

(2) Ri

(3) CMRR

(4) B.W.

(5) Slew Rate

OR

Q.8) (A) Draw neat circuit diagram of Wien Bridge Ocscillator. Calculate Frequency of oscillations if R = 50 kΩ and C = 0.001 μF. **[06]**

(B) List the four Topologies of Negative Feedback and give the effect on Input and Output Resitance in each case. **[06]**

(C) Draw and explain Voltage Follower using OP-Amp. **[04]**

Q.9) (A) What is Transducer ? Compare Active and Passive Transducer. Give example of each. **[04]**

(B) With the help of neat circuit diagram explain construction and Working of LVDT. **[08]**

(C) Compare three types of Temperature Transducers. **[04]**

OR

Q.10)(A) Explain following Characteristics of Transduccer : **[04]**

(1) Accuracy

(2) Ruggedness

(3) Linearity

(4) Repeatability

(B) Write short notes :

(1) Strain Guage

(2) Piego-electric Transducer **[12]**

(3) RTD

Q.11)(A) Explain the following Front Panel Controls of CRO : **[08]**

(1) Trigger

(2) Chop

(3) Alternate

(4) X-Y Posision

(B) Draw neat circuit diagram of Square Wave Oscillator using IC 555 and Calculate the component values to generate frequency of 1 kHz with duly cycle of 80% (Assume C = 0.001 μF) **[10]**

OR

Q.12)(A) Explain with block diagram : **[08]**

(1) Electronic Counter

(2) Burglar Alarm

(B) Draw neat circuit diagram of Monosable Multivibrator and explain its operation with the help of Waveforms at Trigger, Timing Capacitor, Output Voltage. Give applications of this circuits. **[10]**
