Hall Ticket No | | | | | | | | | | | Question Paper Code: AECB01

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Four Year B.Tech III Semester End Examinations(Regular) - November, 2019

Regulation: IARE – R18

BASIC ELECTRONICS ENGINEERING

Time: 3 Hours **(CE)** **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Explain the V-I Characteristics of Zener diode. **[7M]**
   (b) A Zener diode has an impedance of 40Ω in the range for I_Z = 1mA to 10mA. The voltage corresponding to I_Z of 1 mA is 9V.For constant impedance over the given range,what is the minimum & maximum zener voltages can be expected if the diode is used in an application where the zener current varies from 2mA to 8 mA. **[7M]**

2. (a) Demonstrate the working of full wave rectifier capacitor filter. Derive the expression for rectifier efficiency. **[7M]**
   (b) A full wave rectifier having load resistance of 100Ω is fed with 220V, Assuming the diodes are ideal, Find the following terms i) DC output voltage ii) Peak inverse voltage iii) Rectifier efficiency. **[7M]**

UNIT – II

3. (a) Draw the input and output characteristics of CB Configuration and explain **[7M]**
   (b) Determine the collector current and emitter current for a transistor with $\alpha = 0.99$ and $I_{CBO} = 490\mu$A when the base current is 19μA? **[7M]**

4. (a) Explain the construction & operation of D- MOSFET. **[7M]**
   (b) The N-channel FET has a $|I_{DS}|$=20mA, $|V_p|$=5V, V_{GS} is -3V. Determine I_D, gm and g_{m0} ? **[7M]**

UNIT – III

5. (a) Define slew rate. Obtain slew rate equation for op-amp voltage follower. **[7M]**
   (b) The input signal to an op-amp is 0.03sin(1.5×105)t. calculate maximum gain of an op-amp with the slew rate of 0.4V/µ sec. **[7M]**

6. (a) Explain the operation of inverting and non inverting comparator. **[7M]**
   (b) Design a comparator circuit for input voltage = $2V_{pp}$ sine wave at 1KHz, V_{ref}=500mV, R=100Ω, and supply voltage= ±15V. Draw the output waveform **[7M]**

UNIT – IV

7. (a) Explain the operation of monostable multi vibrator using IC555 & obtain the expression for its pulse width. **[7M]**

   (b) Illustrate the working of flash type analog to digital converter. **[7M]**

8. (a) Explain the operation of R/2R ladder type D/A Converter. **[7M]**

   (b) Design an a stable multi vibrator for an output frequency of 1KHZ with a variable duty cycle of 30% to 70%. Assume $V_{CC} = 12$V. **[7M]**

UNIT – V

9. (a) Demonstrate the operation of 4 bit synchronous counter with necessary sketches **[7M]**

   (b) Subtract using 2's complement method

   i) $(101011)_2$ from $(111001)_2$

   ii) $(10001)_2$ from $(11001)_2$ **[7M]**

10. (a) Draw and explain master-slave JK flipflop. **[7M]**

    (b) Convert the following Hexadecimal numbers to their decimal equivalent $(EAF1)_{16}$ and $(AE1)_{16}$. **[7M]**