

- (b) Explain the concept of current-shunt feedback amplifier by help of suitable diagram & Chnac Graf. [8]
- OR**
- Q.4 (a) Explain feedback amplifiers with its classification & concept. [8]  
 (b) An amplifier with an open loop voltage gain of 1,000 delivers 10 W of output power at 10% second harmonic distortion when the input single in 10mV. If 40dB' -ve' voltage series feedback is applied and the output power is to remain at 10W. Determine - [8]

- (i) The required input single  
 (ii) percentage second harmonic distortion  
 (iii) close loop & voltage gain

**UNIT-V**

- Q.5 (a) Explain Design of Mono-stable multi-vibrators. [8]  
 (b) Explain a wien bridge oscillator with its diagram and applications. [8]

**OR**

- Q.5 (a) Draw and explain Schmitt trigger. [8]  
 (b) Explain an oscillator, its classification & criterion. [8]

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**B. Tech III Sem. (Main/Back) Exam. Jan. 2016**  
**Computer Science & Engineering**  
**3CS1A Electronic Devices & Circuits**  
**CS, IT**

**Time: 3 Hours** **Maximum Marks: 80**  
**Min. Passing Marks: 26**

**Instructions to Candidates:**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.  
 Units of quantities used/calculated must be stated clearly.  
 Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL \_\_\_\_\_  
 2. NIL \_\_\_\_\_

**UNIT-I**

- Q.1 (a) Explain the concept of charge densities in a semiconductor. Also explain Fermi Dirac distribution. [10]  
 (b) Find the conductivity of n-type Ge at room temp, assuming one donor atom in each  $10^8$  atoms. The density of Ge is  $5.32 \times 10^3 \text{ Kg/m}^3$  and the atomic weight is 72.6 Kg/K-mol. Comment on the result. [6]  
 $[e = 1.6 \times 10^{-19} \text{ C}, \mu_e = 0.38 \text{ m}^2/\text{v-s}, \mu_n = 0.18 \text{ m}^2/\text{v-s}]$

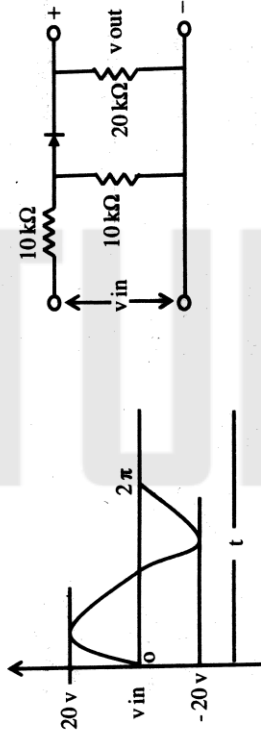
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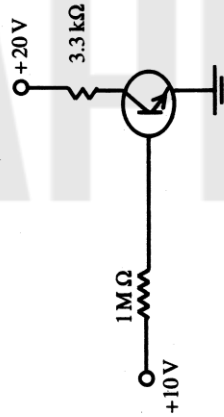
OR

- Q.1 (a) Describe in detail the concept of Mass action law & Hall effect in detail. [10]  
 (b) Sketch the output voltage waveform for the circuit shown below. Assume the diode ideal. [6]



UNIT-II

- Q.2 (a) Draw the load line for the following fig (given below). What is  $I_c$  at saturation point? Find  $V_{ce}$  at cut off point. [6]



- (b) Explain DC & AC analysis of CE & CB amplifiers. [10]

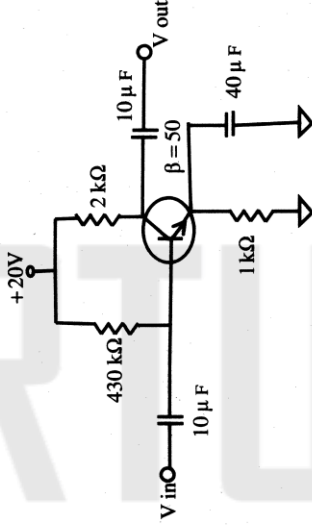
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OR

- Q.2 (a) For the Emitter bias network given below, determine  $I_B$ ,  $I_C$ ,  $V_{CE}$ ,  $V_{e_s}$ ,  $V_B$  &  $V_C$  [8]



- (b) Explain the working concept of Ebers-Moll model. [8]

UNIT-III

- Q.3 (a) Explain the phenomena of FET as voltage variable resistor. [8]  
 (b) Describe in detail the concept of equivalent circuits & biasing of MOSFET's. [8]

OR

- Q.3 (a) Explain Miller's Theorem for Semiconductors amplifiers. [8]  
 (b) Explain the phenomena of Cascading Transistor amplifiers. [8]

UNIT-IV

- Q.4 (a) An amplifier with a gain of 60 dB has an output impedance of 10 kΩ. It is required to modify its output impedance to 1 kΩ. What type of feedback has to be applied? Calculate the feedback factor. Also find the percentage change in the overall gain, for a 10% change in the open loop gain of the amplifier. [8]

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