

Code.No: R07A1EC06

R07

SET-1

**I B.TECH – EXAMINATIONS, JUNE - 2011
ELECTRONIC DEVICES AND CIRCUITS**

(COMMON TO EEE, ECE, CSE, ECOMPE, EIE, ETM, IT, ICE, BME)

Time: 3hours

Max.Marks:80

**Answer any FIVE questions
All questions carry equal marks**

- - -

- 1.a) Explain the construction and working of CRT.
- b) An infinitely large parallel plane plates are spaced 0.8 cm apart. The voltage at one of the plates is raised from 0 to 5 V in one nanosec at a uniform rate with respect to the other. After this duration the potential difference between the plates is suddenly dropped to '0' volts and remain the same there after. Find
 - i) The position of the electron, which started with zero initial velocity from the negative plate, when the potential difference drops to zero volt.
 - ii) The total time of transit of electron from the cathode to the anode. [8+8]
- 2.a) Explain Hall effect. What are its applications?
- b) Derive the expression for the transition capacitance of a reverse biased p-n junction diode. [8+8]
- 3.a) Why is that filtering is easier in FWR outputs? Explain the terms "Ripple Factor", PIV, regulation and rectification efficiency as referred to rectifier circuits.
- b) A FWR makes use of a π - section filter with two $8\mu\text{f}$ capacitors and one 20 H choke. The secondary voltage is 300 V w.r.t center tap. If the load current is 40mA, determine the D.C output voltage and ripple without neglecting the choke resistance of 300Ω . [8+8]
- 4.a) Explain the current components of a transistor. What is early effect? What are its consequences?
- b) Draw the characteristics and explain the operation of enhancement and depletion mode MOSFETS. [8+8]
- 5.a) What are the factors that effect the stability of operating point? Discuss.
- b) Define stability factor. Derive the expression for stability factor for a self biased CE amplifier circuit. [8+8]
6. Draw the approximate hybrid model of a transistor amplifier and derive the expressions for current gain, input impedance, voltage gain and output impedance of a CE amplifier. [16]
- 7.a) Explain the effect of negative feedback on bandwidth and noise in an amplifier.
- b) Distinguish between positive and negative feedback in amplifiers. [8+8]
- 8.a) State and explain the Barkhausen criterion.
- b) Derive the expression for the frequency of oscillations for the RC phase shift oscillator. [8+8]

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