

6. (a) Derive A_i , A_v , R_i , R_o , A_{is} , A_{vs} for CE configuration with unbypassed R_e . Assume $h_{oe} \cdot R_L < .01$. **8**
- (b) Draw a realistic electronic circuit for the use of Miller's as well Miller's Dual theorem. **7**

Unit IV

7. (a) Draw hybrid π mode for C.E. configuration. Derive results for $r_{bb'}$, $r_{b'e'}$, $g_{b'c}$, g_m , h_{ie} etc. **8**
- (b) Explain the concept of gain bandwidth product and derive expression for it. **7**
8. Write short notes on the following :
- (a) Mosfet in enhancement mode
- (b) Derive results for r_o and A_v for FET in CD configuration. Draw its equivalent hybrid and derive above results.

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Roll No.

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B. Tech. EXAMINATION, Dec. 2017

(Third Semester)

(B. Scheme) (Main/Re-appear)

(BME, ECE)

ECE-203-B

ANALOG ELECTRONICS

(A.E.I. 4th)

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) What is Fermi level ? Explain band gap diagrams for conductors, insulators, intrinsic and extrinsic semiconductors. **8**
(b) Explain the fact with the help of mathematical expression that conductivity of semiconductors increases with increase in temperature. **7**
2. (a) Explain how Hall's effect will tell us that the given semi-conductor is n-type or p-type. Derive expression for Hall's voltage. **7**
(b) Draw and explain the switching characteristics of diode. **8**

Unit II

3. (a) Derive a relation for ripple factor for Half wave inductor filter. **7**
(b) Explain the concept of early effect. Also explain how it leads to punch through. **8**

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4. (a) If you are given with a multimeter and a transistor. Can you make out whether it is n-p-n or p-n-p ? If so how ? **6**
(b) Since the value of α is less than 1 in a CB configuration circuit. How does it act as an amplifier in CB configuration. If yes how, if no, why ? **6**
(c) Explain the significance of AC and DC load line of transistor. **3**

Unit III

5. (a) Explain collector to Base bias circuit. Derive a relation for 'S'. Also explain how this biasing helps in combatting the change in β as well as change in temperature. **7**
(b) Explain the concept of bias compensation with the help of a diode. **4**
(c) State condition for thermal stability and explain. **4**

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P.T.O.