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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**GATE QUESTION**

Branch : ECE Subject : Analog Electronic

Year/Sem : II/ III Subject code : 1151EC103

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| 1 | In the circuit of the figure, assume that the transistor is in the active region. It has a large β and its base emitter voltage is 0.7V. the value of Ic is    a. Indeterminate since Rc is not given  b. 1mA  c. 5 mA  d. 10 mA | GATE - 2000  (CO1) |
| 2 | An npn transistor (with C = 0.3 pF) has a unit-gain cutoff frequency fT of 400 MHz at a dc bias current Ic = 1mA. The value of its Cµ (in pF) is approximately   |  |  | | --- | --- | | (VT = 26 mV) |  | | a. 15 | b. 30 | | c. 50 | d. 96 | | GATE - 1999  (CO2) |
| 3 | Negative feedback in an amplifier  a. reduce gain  b. increase frequency and phase distortions  c. reduces bandwidth  d. increases noise | GATE - 1999  (CO3) |
| 4 | An amplifier has an open-loop gain of 100, an input impedance of 1kΩ and an output impedance of 100Ω. A feedback network with a feedback factor of 0.99 is connected to the amplifier in a voltage series feedback mode. The new input and output impedances, respectively are.  a. 10 Ω and 1 Ω b. 10 Ω and 10 Ω c. 100 k Ω and 1 Ω d. 100 kΩ and 1 k Ω | GATE - 1999  (CO3) |
| 5 | An amplifier has an open-loop gain of 100, an input impedance of 1kΩ and an output impedance of 100Ω. A feedback network with a feedback factor of 0.99 is connected to the amplifier in a voltage series feedback mode. The new input and  output impedances, respectively are.   |  |  | | --- | --- | | a. 10 Ω and 1 Ω | b. 10 Ω and 10 Ω | | c. 100 k Ω and 1 Ω | d. 100 kΩ and 1 k Ω | | GATE - 1999  (CO3) |
| 6 | The current gain of a bipolar transistor drops at high frequencies because of  a. transistor capacitances  b. high current effects in the base  c. parasitic inductive elements  d. the Early effect | GATE - 1999  (CO3) |
| 7 | In the differential amplifier of the figure, if the source resistance of the current source IEE is infinite, then the common-mode gain is  a. zero  b. infinite  c. indeterminate | GATE - 1999  (CO4) |
| 8 | Crossover distortion behavior is characteristic of  a. Class A output stage b. Class B output stage  c. Class AB output stage d. Common-base output stage | GATE - 1999  (CO5) |
| 9 | An npn BJT has gm = 38 mA/V, Cμ = 10-14 F, Cπ = 10-13 F, and DC current gain β0 = 0-. For this transistor fT and fβ are  a. fT = 1.64 x 108 Hz and fβ = 1.47 x 1010 Hz  b. fT = 1.47 x 1010 Hz and fβ = 1.64 x 108 Hz  c. fT = 1.33 x 1012 Hz and fβ = 1.47 x 1010 Hz  d. fT = 1.47 x 1010 Hz and fβ = 1.33 x 1012 Hz | GATE - 2001  (CO2) |