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15EC32

Third Semester B.E. Degree Examination, July/August 2021 Analog Electronics

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. Derive an expression for input impedance, output impedance, voltage gain for common-emitter fixed bias amplifier using r_e model. (08 Marks)
- b. Calculate r_e , Z_i , Z_o , A_v for the network shown in Fig.Q.1(b) for un bypassed circuit. (08 Marks)

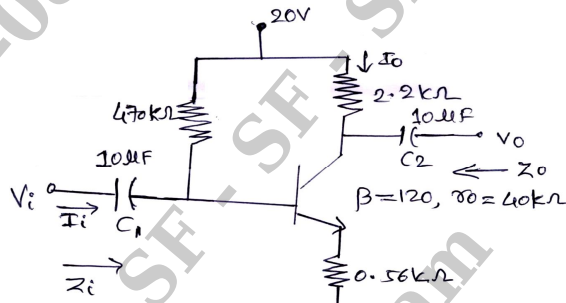


Fig.Q.1(b)

- 2 a. List the advantages of darlington transistor, calculate the dc bias voltages and currents for the circuit shown in Fig.Q.2(a). (06 Marks)

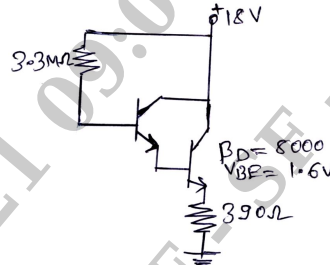


Fig.Q.2(a)

- b. Derive an expression for Z_i , Z_o , A_v and A_i of two port system with hybrid equivalent circuit. (10 Marks)
- 3 a. Explain with characteristics working principle of JFET n-channel. (06 Marks)
 - b. Explain n-channel MOSFET operation. (05 Marks)
 - c. Explain enhancement type MOSFET n-channel. (05 Marks)
- 4 a. Derive Z_i , Z_o , A_v for small signal fixed bias JFET amplifier AC analysis. (10 Marks)
 - b. Derive Z_i for JFET common gate configuration circuit. (06 Marks)
- 5 a. Derive an expression for low frequency response of BJT amplifier to determine the effect of C_S , C_C and C_E . (12 Marks)
 - b. The input power to a device is 10,000W at a voltage of 1000V. The output power is 500W and the output impedance is 20Ω. Calculate power gain, voltage gain in decibels. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

- 6 a. Describe the effect of Miller's capacitance and derive input and output Miller capacitance. (08 Marks)
- b. Derive an expression of low frequency FET response amplifier circuit for effect of C_G and C_C . (08 Marks)

- 7 a. List the advantage of negative feedback. (04 Marks)
- b. Explain effect of negative feed back on bandwidth. (04 Marks)
- c. Derive Z_{if} , A_f for the general voltage-series feedback connection type. (08 Marks)

- 8 a. Explain Wein bridge oscillator with circuit diagram. (06 Marks)
- b. Explain UJT oscillator circuit operation. (08 Marks)
- c. Define Barkhausen criterion. (02 Marks)

- 9 a. Explain types of power amplifiers. (06 Marks)
- b. Explain with circuit diagram operation of push-pull amplifier. (08 Marks)
- c. Define distortion in amplifier. (02 Marks)

- 10 a. Define voltage regulation. (02 Marks)
- b. Explain shunt connected transistor voltage regulator circuit. (06 Marks)
- c. Calculate the output voltage and zener current for the circuit shown in Fig.Q.10(c) with $R_L = 1K\Omega$. (08 Marks)

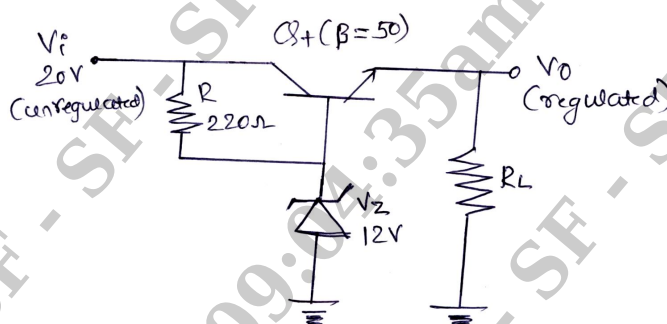


Fig.Q.10(c)
