CBCS SCHEME

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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 re 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)**

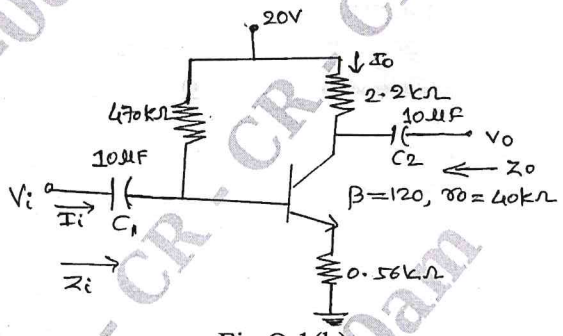

Fig.Q.1(b)

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)**

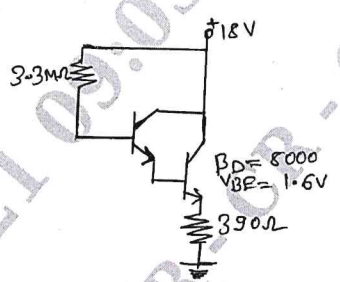

Fig.Q.2(a)

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)**

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)**

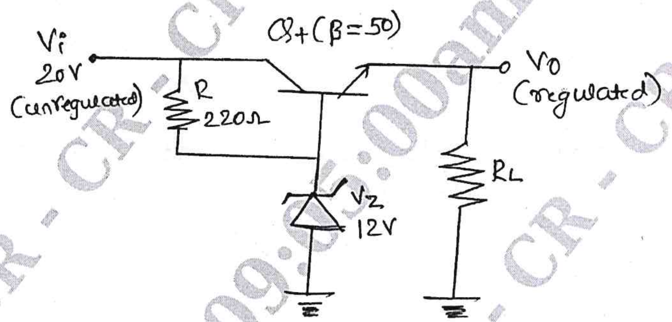

Fig.Q.10(c)

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