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Third Semester B.E. Degree Examination, May/June 2010
Analog Electronics Circuit

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.
2. Draw equivalent circuit wherever necessary.

PART – A

1.
 - a. Explain the different diode equivalent circuits – with necessary approximations if any. (06 Marks)
 - b. Define clipper circuit. Draw and explain symmetrical double ended diode clipper circuit with the help of transfer characteristics. (06 Marks)
 - c. A full wave rectifier using centre tapped transformer supplies a resistive load of 1 K Ω. The transformer secondary end to end voltage is 60 V rms at 50 Hz. The filter capacitance is 500 μF. Calculate : i) Ripple factor ; ii) Output resistance of the filter (R_o) ; iii) V_{dc} ; iv) I_{dc} ; v) % regulation. (08 Marks)
2.
 - a. Explain Emitter bias circuit, with the help of B.E. loop and C.E. loop. Write the necessary equations. (08 Marks)
 - b. Explain the circuit of a transistor switch being used as an inverter. (05 Marks)
 - c. Determine the dc bias voltage V_{CE} and the current I_C for the voltage – divider configuration of Fig.2(c), show below. (07 Marks)

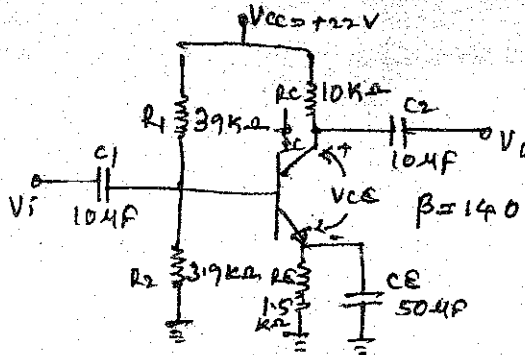


Fig.2(c).

3.
 - a. Define h – parameters. Draw the complete hybrid equivalent circuit of a transistor. (05 Marks)
 - b. Sketch the r_e – equivalent circuit of CE fixed bias configuration and derive the expression for Ar, Ai, Zi and Zo. Show the phase relationship between input and output wave form. (10 Marks)
 - c. For common base configuration shown in Fig.3(c). Determine : (05 Marks)
 - i) r_e ; ii) Zi ; iii) Zo ; iv) Ar ; v) Ai.

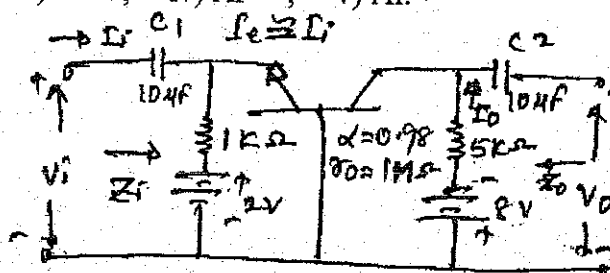


Fig.3(c)

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.

- 4 a. Describe miller effect and derive an equation for miller input and output capacitances. (10 Marks)
 b. Discuss the low frequency response of BJT amplifier and give expression for lower cut-off frequency due to C_C , C_E and C_S . (10 Marks)

PART – B

- 5 a. Draw the cascade configuration and list the advantages of this circuit. (05 Marks)
 b. With necessary equivalent circuit diagram obtain the expression for Z_{in} , Z_o and A_v for a Darlington Emitter follower. (08 Marks)
 c. Derive expression for Z_{if} and Z_{of} for voltage series feed back amplifier and list the advantages of negative feed back amplifier. (07 Marks)
- 6 a. Give the definition of power amplifiers and list the types of power amplifier based on the location of 2 – point. (04 Marks)
 b. Explain the workings of class – B push pull amplifier. Obtain an expression for maximum conversion efficiency of this amplifier. (10 Marks)
 c. Calculate the harmonic-distortion components for an output signal having fundamental amplitude of 2.5 V, second harmonic amplitude of 0.25, third harmonic amplitude of 0.1 V and fourth harmonic amplitude of 0.05 V and also calculate the total harmonic distortion for the amplitude components given above. (06 Marks)
- 7 a. Explain how a feed back circuit can be used as oscillators. (04 Marks)
 b. Explain with help of circuit diagram, the working of an RC phase shift oscillator. (08 Marks)
 c. A quartz crystal has $L = 0.12$ H, $C = 0.04$ pF, $C_m = 1$ pF and $R = 9.2$ K Ω . Find:
 i) Series resonant frequency ; ii) Parallel resonant frequency. (08 Marks)
- 8 a. Discuss the difference between FET and BJT. (04 Marks)
 b. With a necessary oc equivalent model of JFET common-drain configuration. Obtain the expression for Z_i , Z_o and A_v . (10 Marks)
 c. Explain FET small signal model with help of graphical representation of g_m . (06 Marks)

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