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06ES32

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 filer capacitance is 500 μF. Calculate : i) Ripple factor ; ii) Output resistance of the filter (Ro) ; iii) Vdc ; iv) Idc ; 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)**

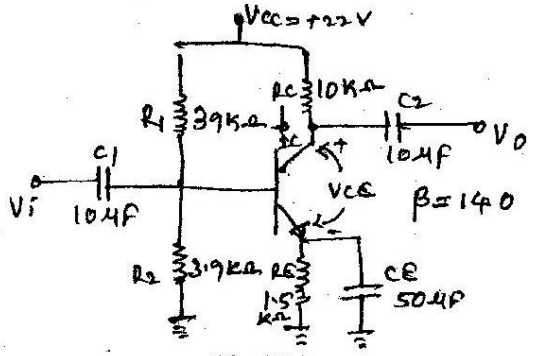

Fig.2(c).

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 :
i) re ; ii) Zi ; iii) Zo ; iv) Ar ; v) Ai. **(05 Marks)**

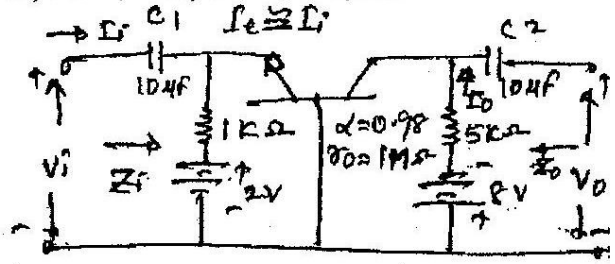

Fig.3(c)

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 Zin, Zo and Av for a Darlington Emitter follower. **(08 Marks)**

c. Derive expression for Zif and Zof 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-distoration 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 distoration 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, Cm = 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 Zi, Zo and Av. **(10 Marks)**

c. Explain FET small signal model with help of graphical representation of gm. **(06 Marks)**

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