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Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, April/May 2012
(2008 Scheme)
Branch : Electronics and Communication
08.305 : ELECTRONIC CIRCUITS – I (T)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions.

1. State the reasons for poor regulations in given dc power supply.
2. Show that the rise time of a low-pass RC circuit is given by 2.2 RC.
3. Draw the transfer characteristics of a top clipper. Assume for the diode a forward resistance R_f and reverse resistance infinity. Give a brief explanation.
4. How short circuit protection is provided in a voltage regulator ? Explain.
5. Draw the small signal equivalent circuit of MOSFET.
6. Compare BJT and MOSFET amplifiers.
7. Discuss about nonlinear distortion in power amplifiers.
8. Explain any one method of biasing a class AB power amplifier.
9. Obtain a relationship between f_α and f_β of a BJT.
10. What is Miller capacitance ? Explain its effect. **(10×4=40 Marks)**

P.T.O.

PART – B

Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

Module – I

11. For the circuit shown in Fig. 1, input voltage is varied linearly from 0 to 150 V. Sketch the output voltage to the same scale as the input voltage. Assume ideal diodes.

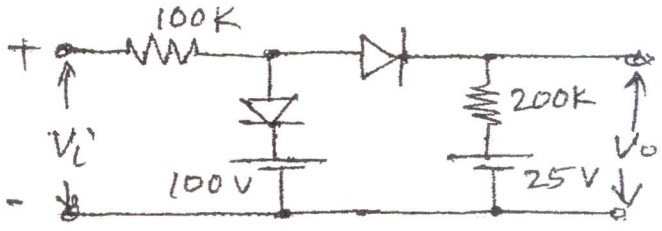

Fig. 1

12. A ramp type signal (Fig. 2(a)) is applied to the circuit of Fig. 2(b) with R = 10 K. The capacitance C is arbitrarily large. Draw the output waveform to scale. For the diode $R_f = 100\ \Omega$, $V_\gamma = 0$ and $R_r = \infty$.

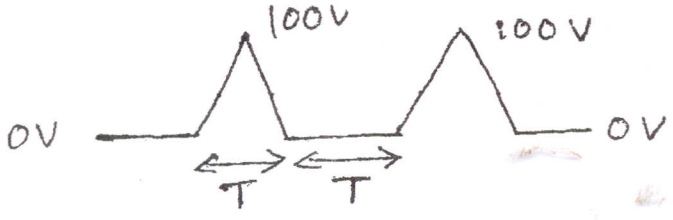

Fig. 2(a)

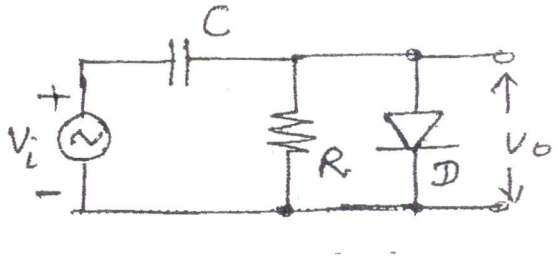

Fig. 2(b)

13. The load resistance in a full-wave rectifier is 500 Ω. The transformer rating is 230 V, 50 Hz primary with 30 – 0 – 30 V secondary. The diode forward resistance is 50 Ω. Calculate (i) average and rms value of current (ii) power output (iii) the efficiency, and (iv) the ripple factor.

Module – II

14. The D MOSFET amplifier shown in Fig. 3 has gmo = 2500 μ s and IDSS = 5 mA. Determine the voltage gain.

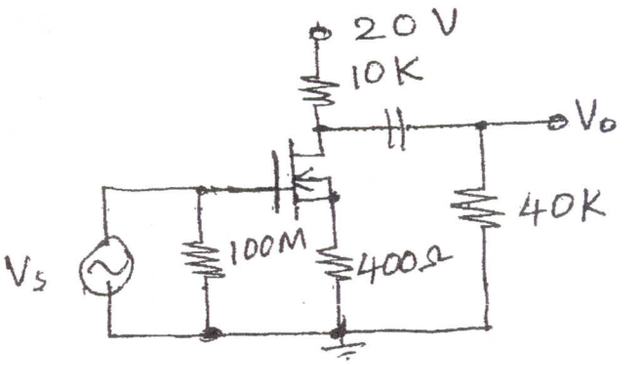

Fig. 3

15. Derive the expression for stability factor S of a BJT voltage divider bias circuit. Compare the performance of this bias with biasing using two power supplies.

16. Calculate current gain of the amplifier shown in Fig. 4 for the BJT β = 50, V_{BE} = 0.5 V and V_A = 100 V.

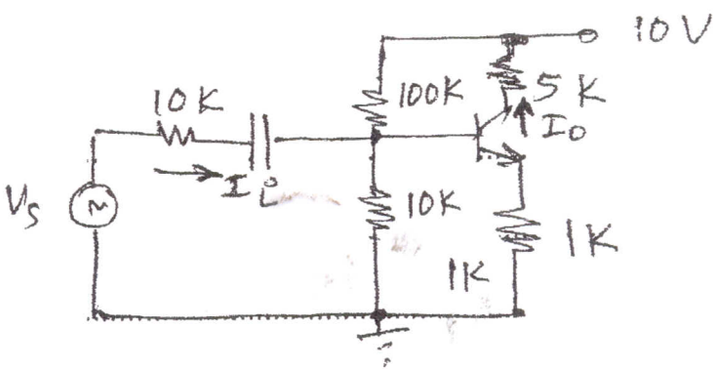

Fig. 4

Module – III

17. Analyse a CB amplifier at high frequency and determine its gain and bandwidth.

18. For a class B push-pull amplifier, $V_{CC} = 20$ V, $R_L = 20\,\Omega$ and $N_2 = 2N_1$, where N_1 is the number of turns from centre point to one end. For the transistor $\beta = 20$ and input is sinusoid. Under ideal conditions, calculate the output signal power and the collector dissipation in each transistor.

19. a) The following parameters were measured on a transistor biased at $I_C = 2$ mA; $\beta_o = 100$, $V_A = 100$ V. Determine the values of g_m, r_π, r_e and r_o.

    b) For a BJT whose unity gain bandwidth is 1 GHz and $\beta_o = 200$, at what frequency does the magnitude of current gain become 10 ? What is ω_β ? **(6×10=60 Marks)**
