Code: R7 311004

R7

B.Tech III Year I Semester (R07) Supplementary Examinations, May 2012

ELECTRONIC CIRCUIT ANALYSIS

(Electronics and Instrumentation Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1 (a) Determine the following small signal parameters of a transistor in common-emitter configuration: (i) Voltage gain. (ii) Current gain. (iii) Input resistance. (iv) Output resistance.
(b) Discuss about Gain bandwidth product.

2 (a) Draw the circuit diagram of a difference amplifier and explain it operation.
(b) A 2 stage FET RC coupled amplifier has the following parameters: g_m = 10 mA/V, r_d = 5.5 K and R_g = 0.5 M for each stage. Assume C_s is arbitrarily large.
(i) What is the overall mid band voltage gain?
(ii) What must be the value of C_b in order that the overall gain of both stages is to be down 1 dB at 10 Hz.

3 (a) Draw the small-signal equivalent circuit of an emitter-follower stage at high frequencies. Find the values of input admittance.
(b) Discuss about the variation of hybrid parameters with temperature.

4 (a) Discuss the origin of various distortions in transistor amplifiers circuits.
(b) Certain power transistor for class A operation has a zero signal power dissipation of 20 W. If the AC output power is 5 W. Find:
(i) Collector efficiency. (ii) Power rating of the transistor.

5 Draw the circuit diagram of single tuned capacitive coupled amplifier and explain its operation. Discuss about its stability.

6 (a) Explain about stagger turning. What are its advantages?
(b) A class C amplifier has a base bias voltage of 5 V and V_{cc} = 30 V. It is determined that a peak input voltage of 9.8 V at 1MHz is required to drive the transistor to its saturation current of 1.8 A.
(i) Find the efficiency. (ii) If an LC tank having C = 200 pf is connected in the collector circuit, find the inductance necessary to tune the amplifier.

7 (a) Explain how shunt type of regulator gives the more current limiting compared to the series type of limiting.
(b) What is the difference between the overload and over current protection in regulators?
(c) Explain the classification power supplies with respect to methods of output voltage regulation

8 (a) Explain the significance of low-pass filter in switching regulator.
(b) What are the limitations of switching regulation?
(c) Why switching frequencies are limited in switching regulator and also explain how to overcome this?

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