

SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E - ECE/E&C/EIE/ETCE

Title of the paper: Electronic Circuits - I

Semester: III

Sub.Code: 517307/6C0035

Date: 03-05-2008

Max. Marks: 80

Time: 3 Hours

Session: AN

PART – A

(10 x 2 = 20)

Answer All the Questions

1. Define ripple factor and transformer utilization factor.
2. A simple capacitor filter is not suitable for heavy loads. Why?
3. Define stability factor of an amplifier. What is its ideal value?
4. Why is it necessary to stabilize the operating point of a transistor?
5. Draw the small signal low frequency model for FET.
6. Briefly explain one of the biasing circuits of MOSFET.
7. What is crossover distortion in a power amplifier and how to eliminate it?
8. Draw the a.c equivalent circuit of small signal HF common emitter amplifier.
9. Mention the advantage of Darlington connection.
10. What are the features of Cascode amplifier?

PART – B

(5 x 12 = 60)

Answer All the Questions

11. (a) With necessary circuit diagram, describe the working principle of full wave rectifier.
(b) Design a simple zener regulator to give a DC fixed output of 6.2V up to a load current of 50mA for an unregulated DC input of 10 – 12 V.

(or)

12. Draw the block diagram of SMPS and explain its operation. What are its advantages?
13. (a) Prove that collector to base bias is better than fixed bias.
(b) Design a collector to base bias circuit to have operating point of (10V, 4mA). The circuit is supplied with 20V and uses a silicon transistor of h_{fe} 250.

(or)

14. Derive the expressions for the current gain and input impedance of a small signal transistor amplifier in terms of the h-parameters.
15. Derive the expressions for the voltage gain of
(a) Common collector amplifier.
(b) Common drain amplifier
Configurations under small signal low frequency conditions.

(or)

16. With neat sketch, explain source self bias and voltage divider bias of FET.
17. Prove that the maximum efficiency of class A transformer coupled power amplifier is 50% and that of class B type is 78.5%.

(or)

18. Draw the circuit of complementary symmetry amplifier and explain its operation. Compare and contrast it with ordinary amplifier.
19. Draw a two stage RC coupled amplifier of identical stages and derive the expressions for its overall voltage gain and current gain.

(or)

20. (a) What is the effect of $C_{b,c}$ on the input circuit of a BJT amplifier at high frequencies?
(b) Find the equivalent Miller capacitance if the $C_{b,c}$ is 10pF, current gain is 0.99, the small signal resistance is 26Ω and the load resistor is $10k\Omega$.

