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Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, December 2015
(2008 Scheme)
08.305 : SOLID STATE DEVICES AND CIRCUITS (E)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **Each** questions carries **4** marks.

1. Differentiate Conductors, Insulators and Semiconductors with respect to Energy diagrams.
2. Derive the equation of collector current of a common emitter configuration including reverse leakage current.
3. Why in CE configuration, base current decreases as V_{CE} increases ?
4. Explain the operation of an enhancement MOSFET.
5. Explain the essential difference between the RC coupled and direct coupled amplifier.
6. A multistage amplifier consists of three stages. The voltage gain of the stages are 30, 60 and 90. Calculate the overall voltage gain in dB (decibel).
7. State Barkhausen criterion for sustained oscillations and explain in detail.
8. Define op-amp Input offset current and Input bias current.
9. Explain thermal drift and slew rate in op-amp.
10. Explain how the op-amp can be used as an Integrator. **(10×4= 40 Marks)**

P.T.O.

PART – B

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

Module – I

11. Derive Input impedance, Output impedance, Voltage gain, current gain of a Common emitter circuit in terms of h-Parameters.

12. Explain the bias compensation techniques for V_{be} and I_{co}.

13. Compare CB, CE and CC configuration.

14. Give Reason
    1) Why the voltage divider bias attain stability ?
    2) Why 180° phase shift between I/P and O/P in CE Amplifier ?

Module – II

15. Derive the output impedance of a current series feedback amplifier.

16. Explain the operation of RC phase shift oscillator and derive the frequency of operation.

17. Draw the hybrid-pi model of CE configuration and explain its parameters.

18. Explain cross over distortion of a class B push pull amplifier and explain how it can be avoided.

Module – III

19. The output of an op-amp voltage follower is a triangular wave input of frequency 2 MHz and 8V peak to peak amplitude. What is the slew rate of the op-amp ?

20. Explain the frequency compensation techniques in op-amp.

21. How the triangular wave is generated using op-amp with the help of circuit ?

22. Derive the voltage gain formula for inverting and non inverting amplifiers.

(6×10= 60 Marks)