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Question Paper Code: 51434

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Electronics and Communication Engineering

15UEC304 - ELECTRONIC CIRCUITS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Which of the following factors contribute to thermal instability in transistor?

   (a) reverse saturation current (b) current amplification
   (c) base-emitter voltage (d) all mentioned above

2. The following is called as emitter follower

   (a) common source amplifier (b) common emitter amplifier
   (c) common collector amplifier (d) common base amplifier

3. Which of the following influences the high frequency response of FET amplifiers?

   (a) inter electrode capacitance (b) doping concentration
   (c) size of the transistor (d) all mentioned above

4. Harmonic distortion is a

   (a) linear distortion (b) non-linear distortion
   (c) micro distortion (d) chromatic distortion

5. Negative feedback is advantage in

   (a) amplifier (b) oscillator (c) inverter (d) rectifier

PART - B (5 x 3 = 15 Marks)

6. What is the need for biasing a transistor?

7. State Miller's theorem.

8. Clarify how the number of stages in a multistage amplifier influences the cut-off frequency and bandwidth.

9. Why are power transistors provided with heat sinks?

10. What is the sensitivity of an amplifier?

PART - C (5 x 16 = 80 Marks)

11. (a) Consider a fixed bias transistor amplifier with collector resistor R_C = 8 $k\Omega$, load resistor R_L = 24 $k\Omega$ and bias voltage V_{CC} = 24V. Draw the DC load line and determine the optimum operating point. Also draw the AC load line. (16)

Or

(b) (i) State and explain the parameters transconductance, drain resistance and amplification factor of a FET. (6)

(ii) Explain various bias compensation methods for BJT circuits. (10)

12. (a) Draw the AC equivalent of a common emitter amplifier with fixed bias using hybrid parameter model and derive the equations for input impedance, output impedance, voltage gain and current gain. (16)

Or

(b) Draw the circuit diagram of an emitter coupled BJT differential amplifier and derive expressions for differential gain, common mode gain, CMMR, input impedance and output impedance. (16)

13. (a) Draw the equivalent circuit of common source amplifier at high frequencies and derive expressions for voltage gain, input admittance and output admittance. (16)

Or

(b) Analyze common emitter amplifier and explain its low frequency response. Derive expressions for voltage gain and lower cut-off frequency. (16)

14. (a) (i) In a class *A* amplifier V_{CEmax} = 25 *V* and V_{CEmin} = 5 *V*. Find the overall efficiency for series-fed load and transformer coupled load. (6)

(ii) Write short notes on thermal stability and heat sink. (10)

Or

(b) (i) Explain the salient features of class D and class S amplifiers. (8)

(ii) Explain with suitable diagrams the various applications of MOSFET power amplifiers. (8)

15. (a) (i) Distinguish between positive and negative feedback. (4)

(ii) Explain the terms feedback factor and open loop gain. Enumerate the effects of negative feedback on the various characteristics of the amplifier. (12)

Or

(b) What are the various types of tuned amplifiers? Explain the working of class C tuned amplifer with input output waveforms and derive the expression for efficiency. (16)

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