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(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 131521 Roll No. | | | | | | | | | | |

B.Tech

(SEM. V) THEORY EXAMINATION, 2015-16

INTEGRATED CIRCUITS

[Time:3 hours] [Total Marks:100

SECTION-A

Note : Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

1. (a) Define current mirror circuit and current steering process.

   (b) Explain the type of distortions that can occur in an amplifier.

   (c) By what factors is the frequency of an op-amp oscillator limited?

   (d) Differentiate between positive feedback and negative feedback.

   (e) Define the terms V_{OH} and V_{OL}.

   (f) Explain Barkhausen criteria for oscillations.

   (g) Sketch properly labeled Master Slave D flip-flop circuit.

(h) What are the uses of Monostable Multivibrator?

(i) Define lock range.

(j) What are the applications of analog multiplier?

SECTION-B

Note: Attempt any five questions from this section

(10×5=50)

2. Find out the output impedance of cascade current mirror circuit. State characteristics of Widlar and Wilson current mirror circuit.

3. What is log amplifier and what are its applications? Draw & explain its operation. Find out the expression for its out voltage equation.

4. A combinational circuit has 3 inputs A, B, C and output F. E. is true for following input combinations.

   A is False, B is True

   A is False, C is True

   A, B, C are False

   A, B, C are True

   (i) Write the Truth table for F. Also write the simplified expression for F. Use the convention True=1 and False =0.

   (ii) Draw CMOS logic circuit for expression obtained for F using NAND gates only.

5. Explain Wein Bridge Oscillator using op-amp and derive the equation for its frequency of oscillation.

6. Draw and explain the principle of working of digital to analog converters with R/2R ladder.

7. Discuss the frequency response of IC 741 op-amp. Also discuss the simplified model of IC 741 op-amp.

8. Design a wide band reject filterwith lower cutoff frequency f_L=5kHz, higher cutoff frequency f_H=100Hz and a passband Gain=2. Draw frequency response plot for that also.

9. Draw the pin diagram of IC 555 and explain the function of each pin. Discuss the modes of operation of 555 timer IC.

SECTION-C

Note: Attempt any two questions from this section.

(15×2=30)

10. Sketch the logic gate symbolic representation of clocked SR flip flop using NOR gate. Also sketch its CMOS circuit implementation and explain its operation.

11. Explain the working of a practical differentiator using op-amp and give steps required to design it.

12. Sketch the circuit and transfer characteristics of Schmitt trigger. What are the applications of Schmitt trigger? Explain its working.

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