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Question Paper Code: 41304

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Electrical and Electronics Engineering

14UEE404 - ANALOG INTEGRATED CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Name the integrated circuit in which separate component parts are attached to a ceramic substrate and interconnected by wire bonds
 - Unipolar IC
 - Hybrid IC
 - Bipolar IC
 - Monolithic IC
- Name the process used for the removal of SiO_2 during the process of IC fabrication
 - epitaxial growth
 - photo etching
 - masking
 - metallization
- Which one of the following is correct regarding the characteristics of ideal Op-Amp?
 - finite open loop gain
 - infinite bandwidth
 - finite input impedance
 - finite offset
- Identify the open loop configuration of Op-Amp from the options given below in which there is a phase shift of 180° between input and output signals
 - Inverting Amplifier
 - Differential Amplifier
 - Non Inverting Amplifier
 - Instrumentation Amplifier

5. Identify the linear application of Op-Amp from the options given below
 (a) rectifier (b) integrator (c) log amplifier (d) clipper
6. DC inserter or restorer is the other name of the _____ circuit.
 (a) clipper (b) rectifier (c) limiter (d) clamper
7. The range of frequencies over which the PLL can acquire lock with an input signal is called
 (a) lock in range (b) tracking range
 (c) capture range (d) pull in time
8. The process of shifting the frequency of an oscillator by a small factor is called
 (a) frequency translation (b) frequency multiplication
 (c) frequency division (d) frequency shift keying
9. Regulators in which the transistor act in the active region are called
 (a) linear regulator (b) switching regulator
 (c) non linear regulator (d) adjustable regulator
10. Voltage regulator LM7805 has an output voltage of
 (a) 5 volts (b) -5 volts (c) 0.5 volts (d) -0.5 volts

PART - B (5 x 2 = 10 Marks)

11. Why inductors are difficult to fabricate in ICs?
12. What is virtual ground?
13. What is a precision diode?
14. Give the applications of multiplier IC.
15. What is an isolation amplifier?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the process of masking and photo etching in IC fabrication. (16)

Or

- (b) Briefly explain the various processes involved in the fabrication of monolithic bipolar transistor. (16)

17. (a) Explain the DC characteristics of Op-Amp. (16)

Or

(b) With neat diagram explain the working of a differential amplifier. (16)

18. (a) With neat diagram explain the working of instrumentation amplifier. (16)

Or

(b) With a neat circuit diagram explain the working of Schmitt trigger using Op-Amp. (16)

19. (a) Enumerate the desirable properties for a Voltage Controlled Oscillator (VCO). Draw the circuit diagram of a Voltage Controlled Oscillator (VCO) and discuss its operation in a detailed manner with proper mathematical equation. State assumptions and approximations, if any. (16)

Or

(b) Explain how frequency translation is done using PLL. (16)

20. (a) With neat circuit diagram explain the operation of SMPS. (16)

Or

(b) With neat circuit diagram explain the working of IC 8038 function generator. (16)
