

Register Number:

B.E DEGREE EXAMINATIONS: APRIL/MAY 2012

Fourth Semester

EEE106: LINEAR INTEGRATED CIRCUITS

(Common to Electrical and Electronics Engineering, Electronics and Instrumentation Engineering & Electronics and Communication Engineering)

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions: -

PART A (10 x 1 = 10 Marks)

1. The process that is used to produce thin metal film layer which serves to make interconnections of various components is
 - a) Isolation
 - b) Metallization
 - c) Ion implantation
 - d) Diffusion
2. Military grade op-amp with higher slew rate version is indicated as
 - a) 741 M
 - b) 741 S
 - c) 741 SC
 - d) 741 R
3. If the value of R_f in an averaging amplifier circuit is equal to one input resistor divided by the number of inputs, the output will be equal to
 - a) The average of the individual inputs
 - b) The inverted sum of the individual inputs
 - c) The sum of the individual inputs
 - d) The inverted average of the individual inputs
4. R_F in practical integrator provides
 - a) DC stabilization
 - b) AC stabilization
 - c) Increases the Bandwidth
 - d) Decreases the Bandwidth
5. A triangular wave oscillator can consist of an op- amp comparator followed by an
 - a) Differentiator
 - b) Amplifier
 - c) Integrator
 - d) Multivibrator
6. If the input to the comparator is a sine wave, the output is a
 - a) Ramp Voltage
 - b) Sine Wave
 - c) Rectangular Wave
 - d) Sawtooth Wave
7. The voltage to frequency converter of VCO is defined as
 - a) $\Delta f_0 / \Delta V_C$
 - b) $\Delta V_C / \Delta f_0$
 - c) Δf_0
 - d) ΔV_C
8. The capture range of IC 565 is
 - a) $\Delta f_c \approx \sqrt{f_1 \Delta f_L}$
 - b) $\Delta f_c = 2 \sqrt{f_1 \Delta f_L}$
 - c) $2 \cdot \Delta f_c \approx 2 \sqrt{f_1 \Delta f_L}$
 - d) $\Delta f_c \approx \sqrt{f_1 \Delta f_L / 2}$
9. Optocoupler is the combination of
 - a) LED and Photo Diode
 - b) Laser and PIN photodiode
 - c) Photo Transistor and Photodiode
 - d) Both A & C

10. The regulation of output voltage is achieved by the feedback circuit consisting of PWM and steering logic circuit in
- a) Switched Mode Power Supply
 - b) Series Regulator
 - c) Shunt Regulator
 - d) Fold Back Circuit

PART B (10 x 2 = 20 Marks)

11. Define the term epitaxial growth
12. What are the advantages of ion implantation technique?
13. Write the output expression of an inverting summer with three inputs V_1 , V_2 and V_3 .
14. Sketch the output waveform of a differentiator circuit if a sine wave and square wave inputs are given.
15. What are the advantages of active filters over passive filters?
16. Draw the characteristics of an ideal comparator and practical comparator.
17. Mention the different modes of operation of 555 IC timer.
18. Draw a variable transconductance multiplier circuit.
19. What are the built – in protection arrangement present in an IC 723 voltage regulator?
20. Write significance of LM380 power amplifier IC.

PART C (5 x 14 = 70 Marks)

21. a) Explain in detail the two processes involved in photolithography.
- (OR)**
- b) (i) Explain how a MOSFET is formed in IC fabrication (10)
- (ii) Enumerate the different IC packaging configurations available (4)
22. a) (i) Discuss the ideal characteristics of an op-amp. Compare with practical op-amp. (4)
- (ii) Briefly explain the different types of frequency compensation techniques applied to op-amp circuit (10)
- (OR)**
- b) (i) For a non inverting operational amplifier with three inputs $V_1=4v$, $V_2=3v$, $V_3=2v$ find the output voltage given $R_F= 10K$ and $R_i= 5 K$. (4)
- (ii) Explain the working of an active integrator and draw its frequency response (10)
23. a) (i) Explain the working of an Astable multivibrator circuit using op amp with necessary diagram and waveforms (10)

- (ii) Design a phase shift oscillator for a frequency of oscillation of 200 Hz. Assume $C=0.2\mu F$ (4)

(OR)

- b) Explain the working principle of Dual slope analog to digital converter (ADC). State its advantages and limitations

24. a) (i) Explain the working of phase locked loop with block schematic (8)
(ii) Explain any one application of PLL. (6)

(OR)

- b) Explain Gilbert multiplier cell. Under what condition Gilbert multiplier cell work as a phase detector

25. a) (i) Explain with internal circuit, the voltage regulation operation of IC 723 (10)
(ii) Discuss about the protection circuits used in voltage regulator (4)

(OR)

- b) Write notes on

- (i) Optocoupler IC (6)
(ii) Function generator IC 8038 (8)
