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Question Paper Code : 52444

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Fourth Semester
Electronics and Communication Engineering
EC2254 – LINEAR INTEGRATED CIRCUITS
(Regulations 2008)
(Common to PTEC 2254 – Linear Integrated Circuits for BE (Part – Time)
Third Semester – ECE – Regulations 2009)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. Enumerate any four advantages of Integrated Circuits (ICs) over discrete component circuits.

2. Find the maximum frequency for a sine wave output voltage of 12V peak with an OP-AMP whose slew rate is 0.5V/μs .

3. What is a transconductance amplifier and state any one application.

4. For a lossy integrator, $R_1 = 10k\Omega$, $R_f = 10 k\Omega$ and $C_f = 10$ nF. Determine the lower frequency limit of integration.

5. List any four applications of Analog Multipliers.

6. Define capture range and lock-in range of PLL.

7. Why are R-2R ladder DACs preferred over binary weighted DACs ?

8. Define resolution of an A/D converter.

9. In the square wave oscillator, calculate the frequency of oscillation if $R_2 = 10k\Omega$, $R_1 = 11.6 k\Omega$, $R = 100k\Omega$ and $C = 0.01 \mu F$.

10. What is the purpose of connecting a capacitor at the input and output side of an IC voltage regulator ?

PART – B   (5×16=80 Marks)

11. a) Explain the various methods used for fabricating IC resistors and compare
       their performance.

                                    (OR)

    b) Explain the non ideal dc characteristics of operational amplifier with
       compensation techniques.

12. a) With a neat circuit diagram explain the working of an instrumentation amplifier.
       Also derive the expression for the gain of the instrumentation amplifier.

                                    (OR)

    b) i) Design a first order low pass filter for a cut off frequency of 1 kHz.   **(4)**

       ii) Construct a second order Butterworth low pass filter and obtain its frequency
           response.   **(12)**

13. a) Explain variable transconductance amplifier in detail and explain analog
       divider using variable transconductance amplifier.

                                    (OR)

    b) With a neat block diagram explain the working of Voltage Controlled Oscillator.
       Also derive the expression for the frequency of oscillation.

14. a) Construct and explain 4 bit weighted resistor Digital to Analog Converter and
       list its advantages.

                                    (OR)

    b) With a neat functional diagram, explain the operation of dual slope analog to
       digital converter.

15. a) i) Obtain a monostable multivibrator using 555 timer to produce a pulse width
           of 300 ms.   **(4)**

       ii) With a neat functional diagram, explain the working of 555 timer as astable
           multivibrator. Also derive the expression for the frequency of oscillation.   **(12)**

                                    (OR)

    b) With neat sketches explain the working of voltage to frequency and frequency
       to voltage converters.

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