Name : ………………………………………………………

Roll No. : …………………………………………………

Invigilator's Signature : ………………………………….

CS/B.TECH (IT) OLD/SEM-3/EC-311/2012-13
2012
ELECTRONIC SYSTEM DESIGN

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

$10 \times 1 = 10$

i) An operational amplifier is a direct coupled

   a) high gain amplifier

   b) low gain amplifier

   c) very high gain amplifier.

ii) An operational amplifier consisting of

   a) one differential amplifier

   b) two differential amplifier

   c) one or more differential amplifier.

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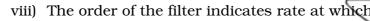[Turn over

iii) Digital ICs are

    a) Flat pack type

    b) Metal cane type

    c) DIP.

iv) Linear ICs require

    a) positive supply voltages

    b) negative supply voltages

    c) both positive and negative supply voltages.

v) Digital ICs require

    a) positive supply voltages

    b) negative supply voltages

    c) both positive and negative supply voltages.

vi) An ideal Op-Amp has

    a) finite slew rate

    b) infinite slew rate

    c) zero slew rate.

vii) The use of negative feedback in a non-inverting amplifier

    a) increase the input impedance

    b) decrease the input impedance

    c) increase the output impedance.

viii) The order of the filter indicates rate at which

    a)   out put changes

    b)   input changes

    c)   none of these.

ix)   The window detector uses

    a)   one comparator and one two threshold levels

    b)   two comparator and two threshold levels

    c)   two comparator and one threshold levels.

x)   Astable multivibrator has

    a)   one stable and one quasi-stable state

    b)   two stable states

    c)   two quasi-stable states.

GROUP – B

(Short Answer Type Questions)

Answer the following questions. $3 \times 5 = 15$

2.   Define

    a)   input offset voltage

    b)   input offset current

    c)   input bias current

    d)   out put resistance

    e)   CMRR.

3.   Design an amplifier to obtain $V_0 = V_1 + 3V_2 + \frac{1}{3} V_3$.

4.   Draw a circuit diagram of astable multivibrator using IC555 and explain its operations. Derive the expression for free running frequency.

GROUP – C

(Long Answer Type Questions)

Answer the following questions.   3 × 15 = 45

5. a)   Draw the circuit diagram of a Logarithmic Amplifier and derive the equation for output voltage.

    b)   What do you mean by instrumentation amplifier ? Draw the circuit diagram of a basic instrumentation amplifier and derive the expression for output voltage.

6.   Draw the a.c. equivalent circuit of a dual input balanced output amplifier. Find out the gain, input and output resistance.

7.   Write short notes on any *three* of the following :   3 × 5

    a)   V-F Converter

    b)   Window Detector

    c)   Precision Rectifier

    d)   Schmitt Trigger

    e)   F-V Converter.

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