



NS – 347

III Semester B.Sc. Examination, November/December 2016  
(F+R) (CBCS) (2015 – 16 & Onwards)  
ELECTRONICS – III  
Linear Integrated Circuits & C Programming

Time : 3 Hours

Max. Marks : 70

- Instructions :**
- 1) Answer **all** questions from Part A, **any five** questions from Part – B and **any four** questions from Part – C.
  - 2) Answer **all** the questions of Part – A in **any one** page the **same** question answered multiple times will **not** be considered for evaluation.

PART – A

Answer all the subdivisions.

(15 x 1 = 15)

1. i) In monolithic ICs components are fabricated by \_\_\_\_\_ process.
  - a) Evaporation
  - b) Sputtering
  - c) Diffusion
  - d) Oxidisation
- ii) Which among these is the ideal characteristic of an op-amp ?
  - a) Input impedance is infinity
  - b) Output impedance is infinity
  - c) Bandwidth is very low
  - d) Open loop voltage gain is very low
- iii) In an op-amp non-inverting amplifier,  $R_1 = 1k\Omega$  and  $R_f = 10k\Omega$ . The voltage gain of the circuit will be,
  - a) -1
  - b) -10
  - c) 11
  - d) 9
- iv) In the common-mode operation of an op-amp,
  - a) one of the inputs is grounded
  - b) the outputs are connected together
  - c) an identical signal appears on both the inputs
  - d) the output signals are in-phase



P.T.O.



- v) The phase shift produced by each RC section in RC phase shift oscillator is  
a)  $30^\circ$       b)  $45^\circ$       c)  $90^\circ$       d)  $60^\circ$
- vi) The Barkhausen criterion for sustained oscillations is given by  
a)  $A\beta = 1$       b)  $A\beta < 1$       c)  $A\beta > 1$       d)  $A\beta < 0$
- vii) The 7912 regulator IC provides \_\_\_\_\_  
a) +5      b) -5 V      c) +12 V      d) -12 V
- viii) A monostable multivibrator has  
a) No external trigger and One stable state  
b) No external trigger and Two stable states  
c) External trigger and one stable state  
d) External trigger and Two stable states
- ix) The invalid variable name among the following  
a) integer      b) Xx      c) net-total      d) sum
- x) Which of the following are tokens in C language ?  
a) Keywords      b) Variables  
c) Constants      d) All of the above
- xi) The valid range of numbers for *int* type of data  
a) 0 to 256      b) -32768 to + 32767  
c) -65536 to + 65536      d) No specific range
- xii) Which operator has the lowest priority ?  
a) ++      b) %      c) +      d) ||
- xiii) Which of the following operator takes only integer operands ?  
a) +      b) \*      c) /      d) %





- xiv) Which among the following is an unconditional control structure ?
  - a) do-while
  - b) if-else
  - c) goto
  - d) for
- xv) Which of the following is a collection of different data types ?
  - a) String
  - b) Array
  - c) Structure
  - d) Files

PART – B

Answer **any five** questions.

(5×7=35)

- 2. a) Mention advantages and disadvantages of IC's. (2+5)
  - b) Draw and explain the block diagram of an op-amp.
- 3. a) Explain the significance of CMRR. (2+5)
  - b) With the circuit diagram, obtain an expression for the voltage gain of a non-inverting amplifier.
- 4. a) What is a Schmitt trigger ? Draw the circuit using op-amp. Sketch the output for sinusoidal input. (3+4)
  - b) Draw the frequency response curves for band-pass, band-reject and all-pass filters. Mention an application of all-pass filter.
- 5. With the circuit diagram, explain the working of Astable multivibrator using 555 Timer. Write the expression for its frequency of oscillations.
- 6. Explain the following operators in C with an example.
  - a) Arithmetic operators
  - b) Relational operator
  - c) Assignment operator
- 7. What is an array ? Write a program to read and print a two dimensional array.
- 8. Explain the *while*, *do-while* and *for* looping techniques in C with examples.







9. a) What is a structure ? Write the syntax for declaration and initialization of a structure. How does a structure differ from an array ? (5+2)
- b) What is a Union ? How to access the individual members of a Union ?

## PART - C

Answer **any four** questions.

(4×5=20)

10. Design and draw an inverting adder using op-amp to get the output expression as

$$V_0 = -(2V_1 + 4V_2 + 1V_3). \text{ Assume } R_f = 10 \text{ K}\Omega.$$

11. Design and draw a first order high pass filter for a cut off frequency of 10kHz, with a pass band gain of 10. Assume  $C = 0.02 \mu\text{F}$  and  $R_f = 20 \text{ K}\Omega$ .

12. A certain Wien bridge oscillator uses  $R = 4.7 \text{ k}\Omega$ ,  $C = 0.01 \mu\text{F}$  and  $R_f = 5 \text{ k}\Omega$ . Calculate  $R_1$  and the frequency of oscillations. Draw the circuit diagram.

13. Write a C program to find minimum and maximum of N numbers.

14. Write a C program to find the GCD of two numbers.

15. Write a C program to calculate factorial of a given number.

