



SS – 387

III Semester B.Sc. Examination, November/December 2018
(Semester Scheme) (CBCS) (F+R)
(2015 – 16 and Onwards)
ELECTRONICS – III

Linear Integrated Circuits and C – Programming

Time : 3 Hours

Max. Marks : 70

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

PART – A

1. Answer **all** the subdivisions : (15×1=15)
- i) The SiO₂ layer in an IC acts as
- | | |
|----------------------|------------------------|
| a) a resistor | b) an insulating layer |
| c) mechanical output | d) none of the above |
- ii) A supply voltages of ± 12 V is applied to an op-amp, the maximum peak to peak output voltage is approximately
- | | |
|-----------|-----------|
| a) 0 V | b) + 12 V |
| c) – 12 V | d) 24 V |
- iii) In an ideal op-amp, the common mode gain is
- | | |
|----------|--------------|
| a) zero | b) infinity |
| c) unity | d) very high |
- iv) An inverting amplifier has $R_1 = 100$ K Ω and $R_f = 1$ K Ω , the scale factor is
- | | |
|---------|-----------|
| a) 100 | b) – 100 |
| c) 1000 | d) – 1000 |
- v) What will be the output for the op-amp integrator circuit when the input is a Square wave ?
- | | |
|--------------------|-------------------|
| a) Triangular wave | b) Unit step wave |
| c) Ramp wave | d) Square wave |

P.T.O.



- vi) A Schmit trigger
- a) has one trigger point
 - b) has two trigger points
 - c) produces triangular output waves
 - d) is designed to trigger on noise voltage
- vii) The IC, LM78XX is a _____ voltage regulator.
- a) adjustable positive
 - b) adjustable negative
 - c) fixed positive
 - d) fixed negative
- viii) The output waveform of a 555 timer is
- a) Triangular
 - b) Rectangular
 - c) Saw-tooth
 - d) Sinusoidal
- ix) The valid name range of numbers for int type of data
- a) 0 to 256
 - b) - 32768 to + 32767
 - c) - 65536 to + 65536
 - d) - 128 to + 127
- x) Which of the following is not a logical operator ?
- a) &
 - b) &&
 - c) ||
 - d) !
- xi) A function that calls itself is called as
- a) passing by values
 - b) stack
 - c) recursive
 - d) passing by address
- xii) Which of the following is not a decision making statement ?
- a) while
 - b) if-else
 - c) goto
 - d) nested if-else
- xiii) An array of structure is a _____ collection of data.
- a) homogenous
 - b) heterogenous
 - c) struct var
 - d) struct members
- xiv) A structure in C-Language is
- a) predefined data type
 - b) function
 - c) user-defined data type
 - d) none of the above
- xv) Which operator connects the structure name to its member name ?
- a) ->
 - b) <-
 - c) •
 - d) Both <- and •



PART – B

Answer **any five** questions.

(5×7=35)

2. a) Classify ICs based on scale of integration. (2+5)
b) With relevant diagrams, explain the steps involved in the fabrication of a NPN transistor.
3. a) With a circuit diagram, derive an expression for voltage gain of a non-inverting amplifier.
b) Define :
 - i) input offset voltage and
 - ii) input bias current of an op-amp. (5+2)
4. a) With a circuit diagram, explain the working of phase shift oscillator, write the expression for its frequency of oscillations.
b) Sketch the frequency response curves of band pass and band reject filters. (5+2)
5. a) With a circuit diagram, explain the working of an instrumentation amplifier.
b) Draw the circuit of a Moonstone multivibrator using IC 555. (5+2)
6. a) Explain different data types used in C-Language.
b) Explain the difference between pre-increment and post-increment with an example. (4+3)
7. Explain :
 - i) break statement and
 - ii) for loop statement with an example. (3+4)
8. With an example, explain any five string functions. 7
9. a) What is a structure ? Write the syntax for declaration and initialization of a structure. How does a structure is differ from an array ?
b) What is a Union ? How to access the individual members of an Union ? (5+2)

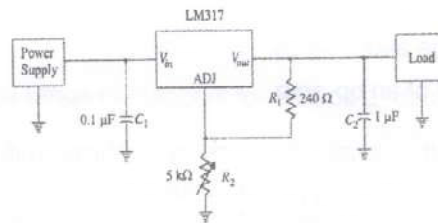


PART - C

Answer any four questions.

(4×5=20)

10. In an inverting amplifier, if $R_1 = 5 \text{ K}\Omega$ and $R_f = 30 \text{ K}\Omega$ and $V_i = 1 \text{ V}$, find V_o and A_{CL} . What will be the load current if $10 \text{ K}\Omega$ load is connected across the output? 5
11. Design and draw a circuit diagram of a high pass filter for a cut-off frequency of 5 KHz with a pass band gain of 5. Assume $R_1 = 5 \text{ K}\Omega$ and $C = 0.01 \mu\text{F}$. 5
12. a) Calculate the output voltage in the following circuit, if R_2 is adjusted to $2 \text{ K}\Omega$. Assume $V_{ref} = 1.25 \text{ V}$.



- b) Calculate the frequency of oscillations of astable multivibrator using 555 timer, if $R_A = 5 \text{ K}\Omega$, $R_B = 10 \text{ K}\Omega$ and $C = 0.01 \mu\text{F}$. (2+3)
13. Write a C program to generate Fibonacci series up to limit N. 5
14. Write a C program to generate prime numbers upto an integer N. 5
15. Write a C program to find transpose of a given matrix. 5