III Semester B.Sc. Examination, April/May 2021
(CBCS) (F+R) (2015 – 16 and Onwards)
ELECTRONICS – III
Linear ICs and C Programming

Time : 3 Hours

Max. Marks : 70

Instructions : i) Answer **all** the questions from Part – **A, any five** questions from Part – **B, any four** questions from Part – **C**.

ii) Answer **all** questions of Part – **A** in **any one** page, **same** questions answered multiple times will **not** be considered for evaluation.

PART – A

1. Answer **all** the sub-divisions. (15×1=15)

   i) _____ is used as dielectric for capacitor in IC fabrication.
      a) Hydrochloric acid
      b) Formaldehyde
      c) Carbon dioxide
      d) Silicon dioxide

   ii) The differential gain of an Op-Amp is
      a) very high
      b) very low
      c) dependent on input voltage .
      d) about 100

   iii) The ideal Op-Amp has the following characteristics
      a) $R_i = \infty$, $A = \infty$, $R_0 = 0$
      b) $R_i = 0$, $A = \infty$, $R_0 = 0$
      c) $R_i = \infty$, $A = \infty$, $R_0 = \infty$
      d) $R_i = 0$, $A = \infty$, $R_0 = \infty$

   iv) _____ type of amplifier has output voltage equal to the negative average of all input voltages.
      a) Non-inverting averaging amplifier
      b) Inverting averaging amplifier
      c) Non-inverting summing amplifier
      d) None of these

   v) An oscillator circuit converts
      a) a.c. power into d.c. power
      b) d.c. power into a.c. power
      c) mechanical power into a.c. power
      d) none of these

vi) In phase shift oscillator, the total phase shift produced by three RC networks is

a) 90°　　　　　　　　　　　b) 360°

c) 180°　　　　　　　　　　d) 270°

vii) A multivibrator is an electronic circuit used to implement

a) Oscillator　　　　　　　　b) Timer

c) Flip-flop　　　　　　　　　d) All of these

viii) A structure contains

a) Arrays of individual members　　b) Individual structures as its elements

c) Structure variables　　　　　　d) Structure members

ix) All keywords in C are in

a) Lower case letters　　　　b) Upper case letters

c) Camel case letters　　　　d) None of the mentioned

x) _____ is correct with respect to the size of the data types.

a) char > int > float　　　　b) int > char > float

c) double > char > int　　　d) char < int < double

xi) The C code 'for (;;)' represents an infinite loop. It can be terminated by

a) break　　　　　　　　　　b) exit(0)

c) abort()　　　　　　　　　d) terminate

xii) _____ is an example of iteration in C.

a) for

b) while

c) do-while

d) all of the mentioned

xiii) _____ is a correct format for declaration of function.

a) return-type function-name (argument type);

b) argument-type function-name (return type) {}

c) return-type (argument type) function-name;

d) all of the mentioned

xiv) _____ operation is illegal in structures.

    a) Typecasting of structure

    b) Pointer to a variable of the same structure

    c) Dynamic allocation of memory for structure

    d) All of the mentioned

xv) The size of a union is determined by the size of the

    a) First member in the union

    b) Last member in the union

    c) Biggest member in the union

    d) Sum of the sizes of all members

PART – B

Answer **any five** questions.   **(5×7=35)**

2. a) Give the classification of ICs.

    b) Explain the fabrication process of a transistor with relevant diagrams.   **(2+5)**

3. a) Draw the block diagram of the Op-Amp and explain the function of each block.

    b) Define CMRR and slew rate with respect to Op-Amp.   **(5+2)**

4. a) Obtain the expression for the voltage gain of an Op-Amp inverting amplifier.

    b) Draw the circuit diagram of Op-Amp comparator.   **(5+2)**

5. a) Explain the operation of high pass filter using Op-Amp with relevant circuit diagram.

    b) Mention any two fixed IC regulators.   **(5+2)**

6. a) Draw the circuit diagram of phase shift oscillator and explain its working.

    b) Draw the functional block diagram of IC-555 timer.   **(4+3)**

7. a) Explain any two data types in C.

    b) Mention the arithmetic operators in C programming.   **(4+3)**

8. What is an array ? Write a program to read and print a two dimensional array.   7

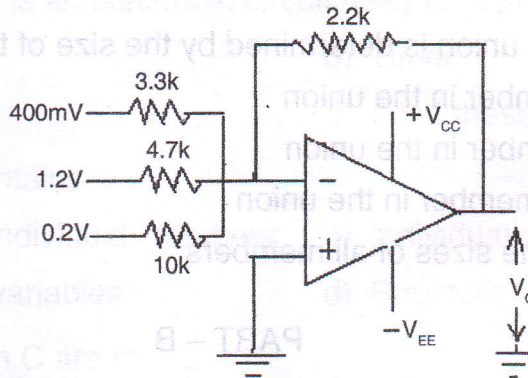9. Explain the *while* and *for* looping techniques in C with examples.   7

PART – C

Answer **any four** questions.   (4×5=20)

10. Calculate the output voltage in the circuit given below.   5

    $V_{CC} = 15V$, $V_{EE} = -15V$

11. In a Wein bridge oscillator, R = 2 KΩ, C = 0.1 μF, calculate the frequency of the output waveform. Draw the relevant circuit diagram.   5

12. Design a low pass filter at a cut off frequency of 4 KHz with pass band gain of 2. Choose C = 0.01 μF and R_F = 100 KΩ.   5

13. Write a C program to generate prime numbers up to an integer N.   5

14. Write a C program to find minimum and maximum of N numbers.   5

15. Write a C program to find the sum of two matrices of order M × N.   5

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