May 2024

B. Tech. (EL) (Sixth Semester)

Electronics Design (ELPC-603)

Time : 3 *Hours*]

[*Maximum Marks* : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) What do you mean by High cut filter ? Define it.   1.5

    (b) What is the difference between passive and active filters ?   1.5

    (c) Differentiate between SR and JK Flip-flop.   1.5

    (d) What is the limit of healthy current for human body ?   1.5

    (e) Differentiate between Reproducibility and Repeatability.   1.5

(f) Represent the decimal number 999 in binary, Octal and Hexadecimal format.   1.5

(g) What are the characteristics of Ideal Op-Amp ?   1.5

(h) What is the relation between IC and Embedded System ?   1.5

(i) What is the role of signal conditioning in circuit designing ?   1.5

(j) What is flicker noise ?   1.5

Part B

2. (a) Find the 9th, 10th, 2's and 1's complement of the given numbers X, Y and consider the value of X = 432, Y = 212. Perform the operation (X–Y) and (Y–X) using 9th and 10th complements and binary complements for the given numbers.   8

   (b) Define signal filters and their classifications. Justify the role of electronic filters in life of human beings.   7

3. Explain the working mechanism of Instrumentation amplifier based on two operational amplifiers.   15

4. Explain the design steps of PCB fabrication. What are the major issues should be taken into consideration ? What is the effect on circuit if Interline capacitance is too high ? How can we reduce it while PCB designing ?   15

5. Write short notes on the following :   15

   CPLD and FPGA's

6. (a) Design a non-inverting active low pass filter that has gain of ten at low frequencies, a high frequency cut-off or corner frequency of 159Hz and an input impedance of 10kΩ also draw the schematic and frequency response. 8

   (b) Differentiate between Accuracy and Precision.   7

7. (a) What is Data Acuisition System (DAS) ? What is benefit of using PC in Data Acquisition System ?   8

   (b) Explain the block diagram 8051 with detailed description of all the blocks.   7