Reg. No. | | | | | | | | | | |

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

FOURTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER DEGREE EXAMINATION, JUNE - 2019

SUBJECT: ANALOG SYSTEM DESIGN [ICE 2204]

TIME: 3 HOURS MAX. MARKS: 50

Instructions to candidates :*Answer ALL questions and missing data may be suitably assumed.*

1A Design an OpAmp circuit for amplifying a 5mV output from a sensor to 3V.

1B For the circuit in Fig.Q1B, obtain the output voltage and find the CMRR considering $(R_3/R_1)\neq(R_4/R_2)$.

1C Compare and contrast the working, design and applications of a V to I converter with regard to an I to V converter.

(2+4+4)

2A In the lossy integrator of Fig.Q2A, if Rf=100KΩ, C= 10nF, R=10kΩ, determine the response for a 1V peak sine wave.

2B Discuss on the working of any 3 different clamper circuits using OpAmp.

2C Design a practical differentiator circuit using OpAmp. How does it differ from a basic differentiator?

(2+3+5)

3A Determine the quality factor of a band pass filter with f_l=400Hz and f_h= 2kHz.

3B Derive the design equations for a Weinbridge Oscillator oscillator.

3C Design a second order low pass filter with a higher cut off frequency of 1KHz. Draw the frequency response of the filter.

(2+3+5)

4A What is meant by a zero crossing detector? Describe with a circuit.

4B Discuss on the internal architecture of a 555 timer.

4C Design an OpAmp square wave generator for generating a signal of 1KHz frequency.

(2+4+4)

5A The basic step of a 9-bit DAC is 10.3mV. If 000000000 represents 0V, what output does 101101111 give?

5B With neat circuit diagram, explain the working of a D/A convertor with R-2R ladder circuit.

5C Discuss on the working of a flash type ADC.

(2+4+4)

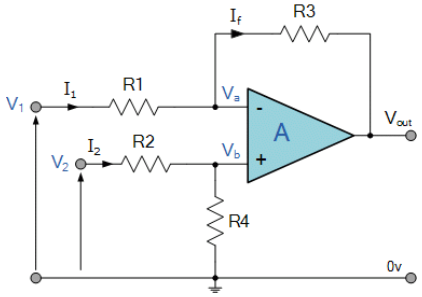

Fig.Q1B

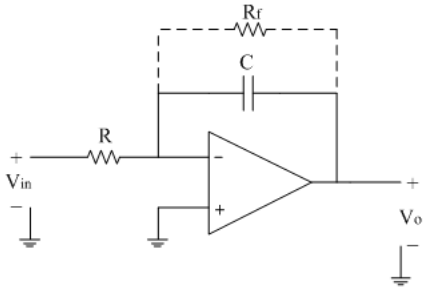

Fig.Q2A

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