Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

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

END SEMESTER EXAMINATIONS, JUNE 2017

SUBJECT: ANALOG SYSTEM DESIGN [ICE 2204]

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** questions.
- Missing data may be suitably assumed.

1A.	Define slew rate. Explain the causes of slew rate.	**2**
1B.	Explain briefly each stage of the op-amp internal circuit with its block schematic. Draw the basic differential amplifier circuit using transistors and explain how the output voltages change when a difference mode signal is applied.	**5**
1C.	Design a circuit such that $V_o = 6V_2 - 4V_1$.	**3**
2A.	Draw the circuit diagram of a voltage to current converter with grounded load. Derive the expression for load current.	**3**
2B.	Obtain the transfer function between input and output voltages of Fig. Q2B.	**3**
2C.	Draw the circuit for a twin T notch filter. Derive its transfer function.	**4**
3A.	Draw the circuit diagram of monostable multivibrator using op-amp. With the help of waveforms, derive the expression for pulse width.	**5**
3B.	Describe the working of astable multivibrator using 555 timer.	**3**
3C.	Draw the circuit of a Schmitt trigger using 555 timer and explain its operation.	**2**
4A.	Derive the expression for frequency of oscillation for Wien bridge oscillator with circuit diagram.	**4**
4B.	Explain the working principle of Phase Locked Loop with block diagram.	**4**
4C.	Design RC phase shift oscillator with f_o = 1.5KHz. Assume C = 0.01µF.	**2**
5A.	Describe the working of counter type ADC with block diagram and relevant waveforms. List its disadvantages.	**4**
5B.	Determine the output of an R-2R Ladder Digital to Analog Converter with input 0001.	**4**
5C.	Define Linearity and Accuracy for a Digital to Analog Converter.	**2**

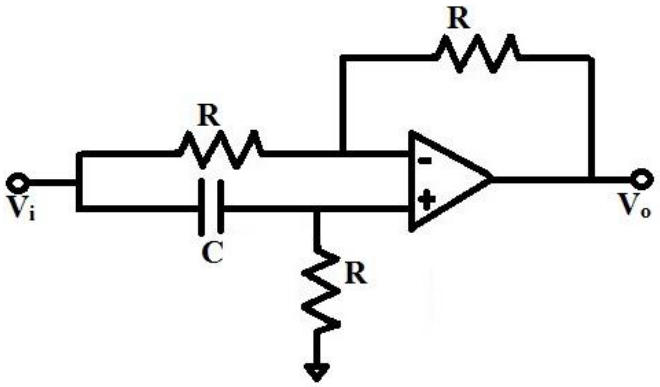

Fig. Q2B

******* END *******