Code No: 56059 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, December - 2017
ANALOG AND DIGITAL IC APPLICATIONS
(Mechanical Engineering - Mechatronics)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Write all ideal characteristics of op amp.
b) What is CMRR of op-amp and explain its significance.
c) Draw the circuit diagram of inverting operational amplifier and derive the equation of voltage gain. [5+5+5]

2.a) How an op-amp is used as integrator and explain its working with neat circuit diagram and waveforms.
b) Explain the working of sample and hold circuit using operational amplifier. [7+8]

3.a) Design a active low pass filter using operational amplifier with a cutoff frequency of 2KHz. Assume any required data.
b) How to generate a square wave using operational amplifier and draw a circuit diagram and explain its working. [7+8]

4.a) Draw the circuit diagram of Astable multiplier using IC 555 timer and explain its working with neat waveforms.
b) Draw the block diagram of PLL and explain the working of each block. [8+7]

5.a) What are the drawbacks of weighted resistors DAC and how these are overcome in R-2R ladder DAC?
b) Explain the working of counter type ADC with neat circuit diagram. [7+8]

6.a) What is totem pole and explain the working of TTL NAND gate.
b) How to interface CMOS to TTL technologies. [10+5]

7.a) Design a 4×1 multiplexer using TTL 74XX series ICs and explain its working.
b) Explain the working of Digital comparator circuit with neat logic diagram. [7+8]

8.a) Which TTL 74XX series is used to design a synchronous counter? Draw such logic diagram and explain its working.
b) Draw the architecture of ROM and write its applications. [8+7]

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