Code No: 56059 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, April - 2018
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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used paper 23-04-2018

1.a) Compare the ideal and practical characteristics of an op amp.
b) Explain the operation of op amp in (i) Inverting mode and (ii) Differential mode. [8+7]

2.a) With neat circuit diagram explain the working principle of IC 723 voltage regulator.
b) Draw the circuit diagram of Differentiator using op-amp and explain its operation with relevant wave forms [8+7]

3.a) Design a square wave generator of frequency 100 Hz and duty cycle of 50%.
b) Design a first -order low pass filter so that it has a cut off frequency of 2 kHz and pass band gain of ‘1. [8+7]

4.a) With the aid of functional schematic diagram of 555 timer, explain how it can be used as astable multivibrator.
b) Explain VCO operation in PLL. [8+7]

5.a) Draw and explain the internal architecture of IC 1408 DAC.
b) Sketch the 2 bit and 3 bit R-2R Ladder DAC. [8+7]

6.a) What is meant by Tristate logic? Draw the circuit of Tristate TTL logic and explain the functions.
b) Discuss the advantages of CMOS logic and explain the concept of CMOS transmission gate. [8+7]

7. Write a short note on:
a) Priority Encoder using IC 74xx
b) Digital comparator circuits.
c) Applications of multiplexers. [5+5+5]

8.a) Draw the basic cell structure of Dynamic RAM. What is the necessity of refresh cycle? Explain the timing requirements of refresh operation.
b) Draw the logic diagram of 74×163 binary counter and explain its operation. [8+7]

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