

Code No: V0222

R07**SET - 1****II B. Tech II Semester Supplementary Examinations, Dec – 2012****LINEAR DIGITAL IC APPLICATIONS**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
All Questions carry **Equal** Marks

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1. a). Derive the output voltage of an op - amp based differential amplifier.  
b) Compare and contrast an ideal OP-AMP and practical OP-AMP.
2. a) Explain how an op - amp can be used as comparator? Draw the diagram obtain the expression for the output.  
b) Write short notes on Voltage regulators.
3. a) Explain thermal drift and slew rate.  
b) Explain the operations of band reject and all pass filters
4. a) What is the purpose of low pass filter in a phase locked loop? Describe different types of low pass filters used in PLL.  
b) Using a block diagram explain the functioning of 565.
5. a) With the help of a neat circuit diagram and waveforms, explain the operation of a dual slope ADC. What are its special features?  
b) Draw the circuit of weighted resistor DAC and derive expression for output analog voltage  $V_o$ .
6. a) Which is the fastest non-saturated logic gate/ Draw the circuit and explain its operation?  
b) What are the advantages and disadvantages of CMOS over TTL gate?
7. a) Explain the function of a Parity generator with an example.  
b) With a truth table explain the logic of a Half-Subtractor.
8. a) List out the differences between sequential and combinational circuits.  
b) Explain the function of static and Dynamic RAMS

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**R07****SET - 2****II B. Tech II Semester Supplementary Examinations, Dec – 2012****LINEAR DIGITAL IC APPLICATIONS**

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Answer any **FIVE** Questions  
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1. a) Explain the use of constant bias circuit in operation of differential amplifier.
b) List out electrical characteristics of an op - amp.
2. a) Explain the sample and hold circuits.
b) List the features of 723.
3. a) Explain the operations of LPF and HPF filters.
b) With a neat figure explain the method of obtaining a triangular wave form using OP amp.
4. a) Draw the circuit of PLL as frequency multiplier and explain its working.
b) Explain the application of 555 timer as linear ramp generator.
5. a) With the help of a neat circuit diagram and waveforms, explain the operation of a successive approximation ADC. What are its special features?
b) LSB of a 9 - bit DAC is represented by 19.6mv. If an input of 9 zero bits is represented by 0 volts.
 - i) Find the output of the DAC for an input 10110 1101 and 01101 1011.
 - ii) What is the Full scale reading (FSR) of this DAC?
6. a) Explain the operation and verify the truth table of Totem-pole TTL NAND gate.
b) Give the characteristics and advantages of MOS logic.
7. a) Explain the function of an Encoder with truth table.
b) Design a Half adder using NAND gates only.
8. a) Design a Decade counter and explain its operation.
b) Explain the function of synchronous DRAM.

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R07**SET - 3****II B. Tech II Semester Supplementary Examinations, Dec – 2012****LINEAR DIGITAL IC APPLICATIONS**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions
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1. a) Explain the modes of operation of non-inverting differential amplifier.  
b) Write short notes on chip size and circuit complexity of IC.
2. a) Why is it necessary to use an external offset voltage compensating network with practical OP-AMP circuits?  
b) Explain the function of V to I converters.
3. a) Explain, How to obtain triangular wave using a square wave generator.  
b) Explain the working of a RC oscillator.
4. a) Draw the circuit of Schmitt trigger using 555 timer and explain its operation.  
b) Draw the block schematic of a PLL describing the function of each block briefly.
5. a) With the help of a neat circuit diagram and waveforms, explain the operation of a parallel comparator type ADC.  
b) Draw the circuit of weighted resistor DAC and derive expression for output analog voltage  $V_o$ .
6. a) List out the advantages and applications of MOS logic.  
b) Distinguish between static and dynamic power dissipation of a CMOS circuit.
7. a) Explain the function of a 3 to 8 line Decoder with its truth table.  
b) Design 1:8 demultiplexer using two 1:4 demultiplexer.
8. a) Explain the function of ROM architecture.  
b) List out the application of shift registers and counters.

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**R07****SET - 4**

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Time: 3 hours

Max. Marks: 80

Answer any **FIVE** Questions  
All Questions carry **Equal** Marks

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1. a) Explain the modes of operation of inverting differential OP amp
b) List out features of 741 OP amp.
2. a) List out the AC characteristics of an op-amp and discuss about them?
b) Explain the operation of Schmitt trigger
3. a) With a neat block diagram explain the features of VCO.
b) With suitable circuit diagram explain the operation of a triangular wave generator using a comparator and an integrator.
4. a) Give the functional block diagram of VCO NE 565 and explain its working and necessary expression for free running or center frequency.
b) The circuit of an inverting summing amplifier is designed with $R_1 = R' = 1\text{Kohm}$, and $R_2 = 2R_1$, $R_3 = 2R_2$, and $R_n = 2R_{n-1}$, the input voltages $v_1, v_2,$ and v_n can be 0 to 10 V. For $n = 4$, what is the smallest output voltage if at least one input is nonzero?
5. a) What are the basic blocks in an Analog to Digital converter and explain counter type ADC.
b) Compare merits and demerits of A/D converters.
6. a) Compare MOS and CMOS logic
b) Draw the schematic circuits of CMOS NAND and CMOS NOR gates and explain the function of both with truth table.
7. a) Explain the function of a BCD to Binary converter.
b) Convert gray code 1001001011110010 to binary. Explain the operation of conversion.
8. a) Draw the circuit diagram and truth table and explain the operation of a JK flip flop.
b) Explain the function of RAM architecture.