INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

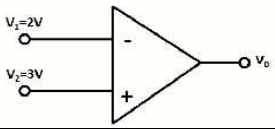
Department of Electrical and Electronics Engineering

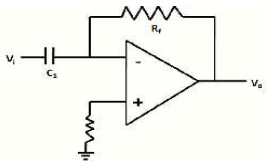
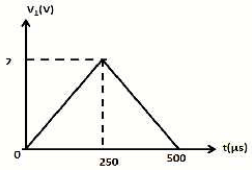
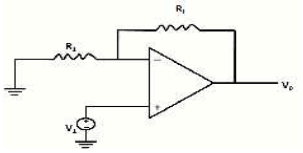
ASSIGNMENT QUESTION BANK

Course Name	**:**	**IC APPLICATIONS**
Course Code	**:**	**A50423**
Class	**:**	**III B. Tech I Semester**
Branch	**:**	**Electrical and Electronics Engineering**
Year	**:**	**2017 – 2018**
Course Faculty	**:**	**Mr. R Gangadhar Reddy, Assistant Professor, ECE**

OBJECTIVES:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

S. No	QUESTION	Blooms Taxonomy Level	Program Outcome
	UNIT - I **INTEGRATED CIRCUITS**		
1	Explain about CMOS open drain output	Understand	1
2	Sketch and explain 2- input TTL NOR gate		
3	Explain the operation of AND gate using diode logic	Understand	1
4	Explain the operation of OR gate using diode logic	Remember	1
5	Construct and explain the two input TTL NOR gate	Apply	1
6	Sketch and explain the CMOS OR-AND- INVERT gate	Apply	2
7	Explain with neat diagram interfacing of a TTL gate driving CMOS gates.	Understand	2
8	Sate the rules for interfacing 5V TTL logic families	Knowledge	1
9	Differentiate TTL, CMOS, and ECL families	Analyze	2
10	Use a combination of CMOS gates to generate the following functions. a) Z = A (buffer) b) Z = A. /B+/A.B (XOR)	Understand	2
11	Construct a CMOS transistor circuit that has the functional behaviour f(z)= $\overline{A.(B+C)}$	Apply	2
12	Sketch the resistive of a CMOS inverter and explain its behaviour for low and high outputs	Apply	2
13	Construct a CMOS transistor circuit that has the functional behaviour f(z)= $\overline{(A+B).(B+C)}$	Apply	2
14	Explain how to estimate sinking current for low output and sourcing current for high output of CMOS gate	Understand	1
	UNIT - II **OP-AMP AND APPLICATIONS**		
1	Define op – amp	Understanding	2
2	What is the value of Vo in the circuit given in the figure below? 	Analyze	2

3	Explain if the open loop gain of an op-amp is very large, does the closed loop gain depend upon the external components of the op-amp?	Analyze	2
4	Why is RE replaced by a constant current bias circuit in a differential amplifier?	Analyze	2
5	List the non ideal characteristics of an op amp	Analyze	2
6	List the parameters that are important for AC applications	Evaluate	2
7	List the non-ideal DC characteristics of an OP-amp. Explain any two.	Understand	2
8	Define offset voltage and offset current as referred to an OPAMP. How are these controlled in a practical non inverting amplifier. Explain with circuit diagrams and analysis	Evaluate	2
9	Discuss the following i) input offset voltage ii) CMRR	Understand	2
10	Discuss the frequency response of an op amp	Evaluate	2
11	The input VL to a differentiator of figure A. is shown in figure. Find the output Vo if Rf = 2K and C1 = 0.1µF  	Evaluate	2
12	Solve the non-inverting amplifier of fig, R1=1K and Rf=10K. Calculate the maximum output offset voltage due to Vios and IB. The op-amp is LM307 with Vios=10mV and IB=300nA, Ios=50nA. Also calculate the value of Rcomp needed to reduce the effect of Op-amp IB. 	Evaluate	2
13	Discuss the function of voltage regulators	Analyze	2
14	Sketch the functional block diagram of 723 regulator	Remember	2
15	Explain the characteristics of three terminal IC regulators	Remember	2
	UNIT - III **ACTIVE FILTERS AND OSCILLATORS**		
1	Define an electric filter	Analyze	3
2	Classify filters	Remember	3
3	Discuss advantages of passive filters	Remember	3
4	Explain why active filters are preferred	Analyze	3
5	Give the list commonly used filters	Analyze	3
6	Sketch and explain first order high pass butter worth filter	Evaluate	3
7	Explain the operation of wide band pass filters	Evaluate	3
8	Sketch the circuit diagram of narrow band pass filter and explain its operation	Remember	3
9	Classify the band reject filters	Understand	3
10	Construct the circuit diagram of wide band reject filter	Understand	3
11	Sketch the output voltage capacitive voltage of the square wave generators	Analyze	3
12	Construct the circuit and wave forms of triangle wave generator	Analyze	3
13	Differentiate swatooth and triangle wave generator	Analyze	
14	Sketch and explain functional block diagram of NE 566	Analyze	3
15	Sketch a neat diagram explain the operation of VCO.	Analyze	3
	UNIT - 1V **TIMER AND PHASE LOCKED LOOPS**		
1	List the basic building blocks of a PLL. Draw the block schematic of PLL.	Analyze	4
2	What is a VCO? Give two applications that require a VCO.	Understand	4

3	Explain the role of low pass filter and VCO in PLLs.	Understand	4
4	What is the Butterworth response?	Analyze	4
5	Sketch the circuit of an op-amp monostable multivibrator and explain its operation.	Apply	4
6	Explain the following for a phase locked loop.	Understand	4
7	Explain in detail any two application of PLL	Understand	4
8	Calculate output frequency f0, lock range fL and capture range fc of a 565 PLL if RT = 10KO, CT=0.01µF and C = 10 µF	Analyze	4
9	Construct the circuit of a Schmitt trigger using 555 timer and explain its operation	Apply	4
10	Explain a digital phase detector with necessary waveforms.	Understand	4
11	Discuss the drawbacks of Analog phase detector using Electronic switch.	Analyze	4
12	Discuss the operation of a FSK generator using 555 timer	Understand	4
13	Explain how is an astable multivibrator connected into a pulse position	Apply	4
14	Discuss the applications of PLL	Apply	4
15	Discuss what are available packages in 555 timer	Apply	4
UNIT - V D TO A AND A TO D CONVERTERS			
1	Explain the basic D/A techniques	Understand	5
2	Sketch the circuit diagram of multiplying DACs explain its operation	Analyze	5
3	Define monolithic DAC and design 1408 D/A converter	Understand	5
4	What is the principle of switch-mode power supplies? Discuss its advantages.	Understand	5
5	Discuss servo tracking A/D converter with its wave form	Understand	5
6	Design an adjustable regulator from the 7810 regulator to get an output voltage of 15V.	Create	5
7	Design a current limit circuit for a 723 regulator to limit the current to 60mA	Create	5
8	Calculate the values of R1 and R2 for a high voltage 723 regulator, so as to get an output voltage of 28V.	Analyze	5
9	Classify the limitations of three terminal regulators? How to overcome these limitations? Explain the necessary circuits.	Analyze	5
10	Explain current fold back characteristics. Explain the current limit protection circuit.	Understand	5
11	Calculate what is the conversion time of a 10 bit successive approximation A/D converter if its 6.85V	Evaluate	5
12	Explain the limitations of three terminal regulators.	Evaluate	5
13	Construct neat diagram explain the operation of Dual-Slope ADC.	Evaluate	5
14	Sketch the diagram and explain the operation of Successive approximation type ADC.	Evaluate	5
15	Explain the operation of Flash type ADC with a neat diagram.	Evaluate	5

Prepared by: Mr. R Gangadhar Reddy, Assistant Professor, ECE

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