Department of Computer Science and Engineering

CSE 251 Electronic Circuits
(Course Project)

Course Outcome: CO4	Program Outcome: PO1	
Cognitive Level: C3	Psychomotor Level: P2, P3	Affective Level: A2
Knowledge Profile: K1, K3	Complex Engineering Problem: EP1, EP2	

Project-1: Design of a Triangular wave generator using Operational Amplifier for a specified input.
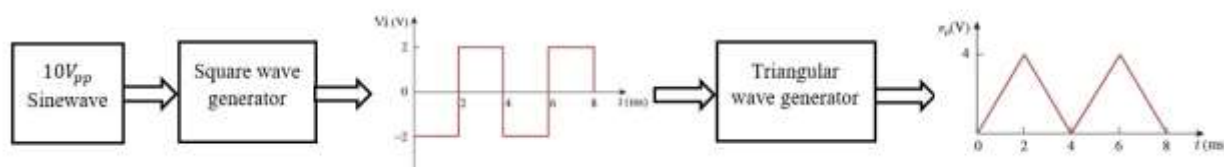

Fig. 1

Fig.1 shows a design process of a Triangular wave generator circuit. The design process includes two design segments (a square wave generator & a triangular wave generator) to get the final output v_o(V). Use a $10V_{pp}$ sinusoid as input and operational amplifiers to design. Design the circuit components and finally simulate to test the circuit. [Note that, for design purpose, the values of the resistors should not exceed more than 10kΩ.]

Project-2: Design a 5V DC Power Supply using Diode for a specified input.
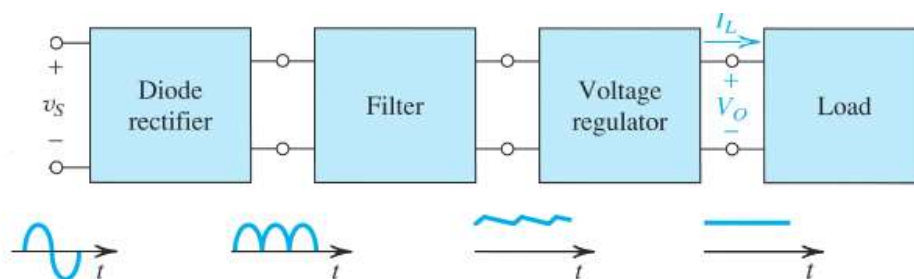

Fig. 2

Fig.2 shows the block diagram of a dc power supply design process. The design process includes three design segments: a diode rectifier, a filter and a voltage regulator to get the final output v_o. The diode rectifier converts the input sinusoid v_S to a unipolar output, which can have the pulsating waveform indicated in Fig. 3. The variations in the magnitude of the rectifier output are considerably reduced by the filter block. The output of the rectifier filter contains a time-dependent component, known as ripple. To reduce the ripple and to stabilize the magnitude of the dc output voltage against variations caused by changes in load current, a Zener shunt voltage regulator can be implemented. Design the circuit components, and finally simulate to test the circuit. Use sine

wave (*24Vp-p*) as input signal, and capacitor, resistors and Zener diode of suitable value for the design. Note that, for design purpose, the values of the resistors should not exceed more than 10kΩ.

Marks Distribution

Assessment Area	Mark
C3: Cognitive: Applying	4
P2: Psychomotor: Manipulation	2
P3: Psychomotor: Precision	2
A2: Affective: Responding	2
Total	**10**

Project Report should contain:

1. Problem Statement
2. Design Details (Identify the circuit structures of the internal blocks and theoretically design the values of unknown parameters)
3. Circuit Diagram (Draw using **VISIO**)
4. Simulation Results (Using the designed & given values of the parameters); you have to take the screenshots of your simulation results.
5. Construct the hardware using the designed & given values of the parameters and show the output to your instructor.
6. Measure and record the output.

[Note that, follow the provided report template]

Project Presentation slide should contain**:**

1. Problem Statement
2. Design Details
3. Circuit Diagram
4. Simulation Results
5. Comparison of theoretically calculated, simulated and measured values