

Problem no. 2

Design a circuit (using Zener diode 1N750) to produce a pure DC supply from an input AC source.

Input AC voltage = $230 \sin 477t$ volts

Output DC voltage = 12 volts

calculation:

$$V_{in} = 230 \sin 477t \text{ volt}$$

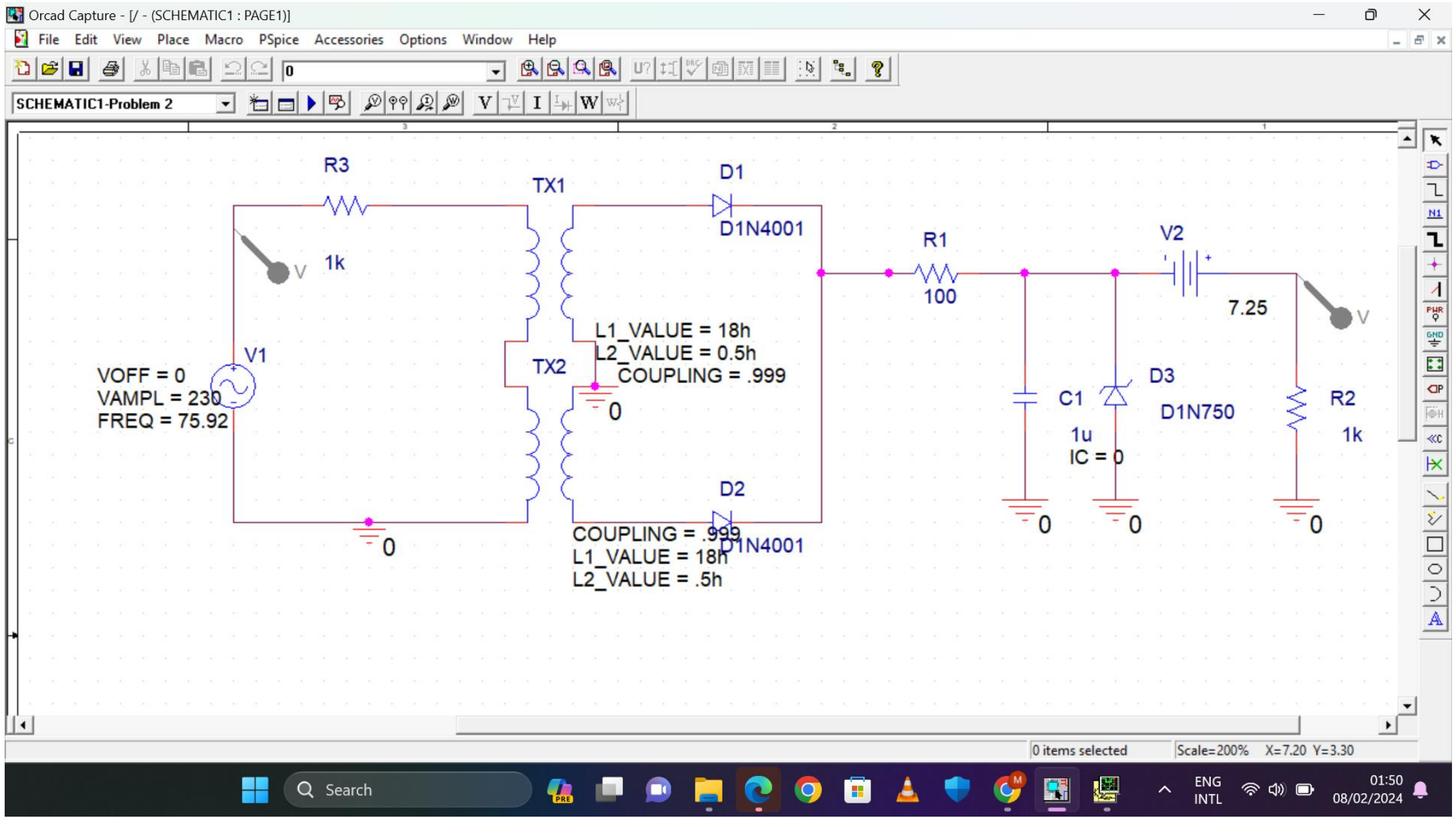
$$A = 230$$

$$2\pi f = 477$$

$$\Rightarrow f = \frac{477}{2\pi}$$

$$= 75.92 \text{ Hz}$$

$$V_{out} = 12 \text{ V}$$



Orcad Capture - [/ - (SCHEMATIC1 : PAGE1)]

File Edit View Place Macro PSpice Accessories Options Window Help

SCHEMATIC1-Problem 2

Simulation Settings - Problem 2

General Analysis Include Files Libraries Stimulus Options Data Collection Probe Window

Analysis type:
Time Domain (Transient)

Options:
☒ General Settings
☐ Monte Carlo/Worst Case
☐ Parametric Sweep
☐ Temperature (Sweep)
☐ Save Bias Point
☐ Load Bias Point

Run to time: 80ms seconds (TSTOP)
Start saving data after: 0 seconds
Transient options:
Maximum step size: 0.01 seconds
☐ Skip the initial transient bias point calculation (SKIPBP)
Output File Options...

OK Cancel Apply Help

VOFF = 0
VAMPL = 230
FREQ = 75.92

R3 1k
V1
V2 7.25
C1 1u IC = 0
D3 D1N750
R2 1k

The image shows the Orcad Capture software interface. The main window displays a schematic diagram of a circuit. The circuit includes a voltage source V1 with parameters VOFF = 0, VAMPL = 230, and FREQ = 75.92. A resistor R3 with a value of 1k is connected to V1. A capacitor C1 with a value of 1u and IC = 0 is connected to ground. A diode D3 (D1N750) is connected to the capacitor. A resistor R2 with a value of 1k is connected to the diode. A voltage source V2 with a value of 7.25 is connected to the diode. The simulation settings dialog box is open, showing the Time Domain (Transient) analysis type and various options. The dialog box has tabs for General, Analysis, Include Files, Libraries, Stimulus, Options, Data Collection, and Probe Window. The General tab is selected, showing the Analysis type as Time Domain (Transient) and the Options section with General Settings checked. The Run to time is set to 80ms, and the Start saving data after is set to 0 seconds. The Transient options section shows the Maximum step size as 0.01 seconds and the Skip the initial transient bias point calculation (SKIPBP) option unchecked. The Output File Options... button is also visible. The bottom of the screen shows the Windows taskbar with various application icons and the system clock displaying 01:50 on 08/02/2024.

