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

Claculation:

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

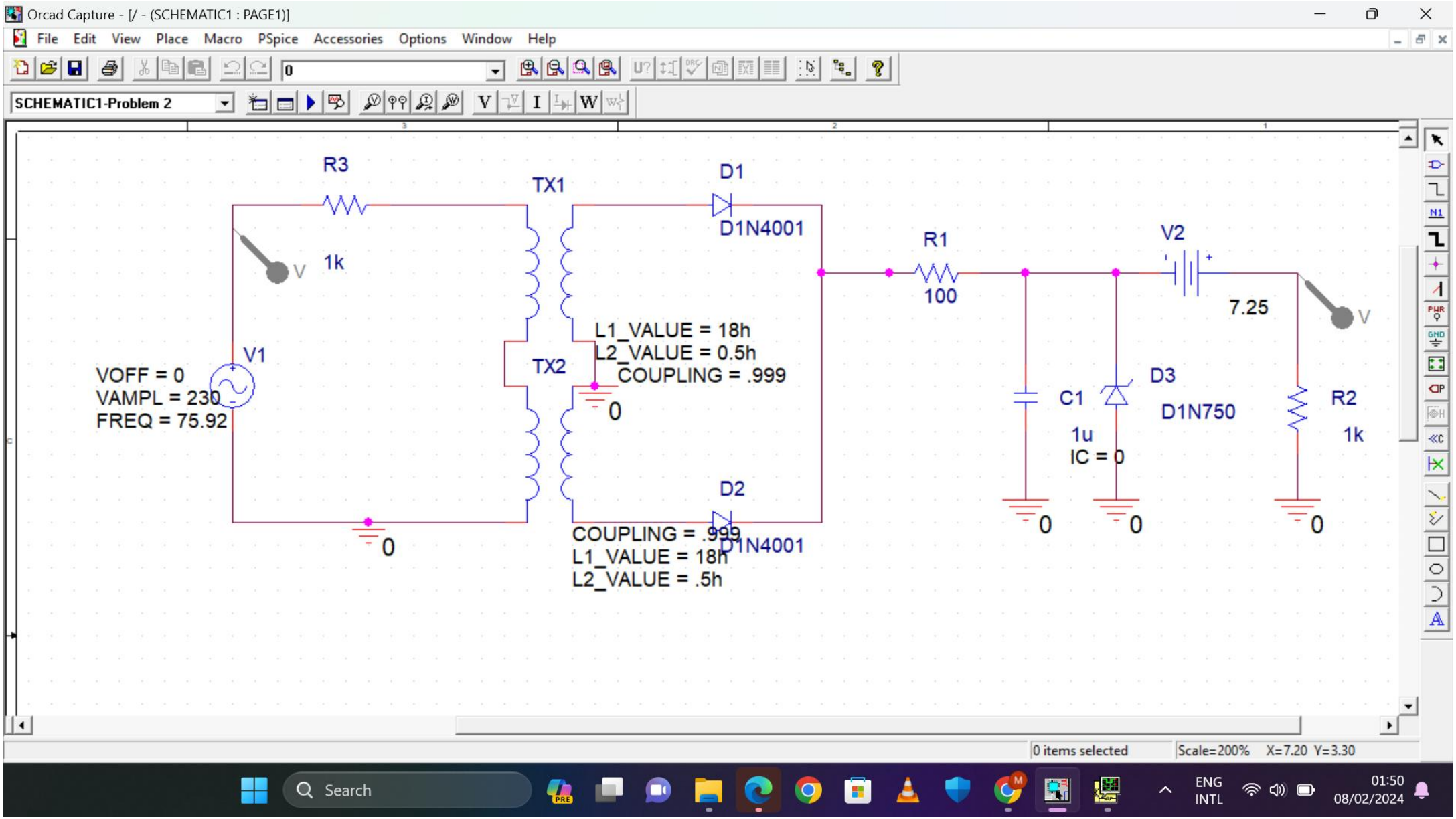
$$A = 230$$

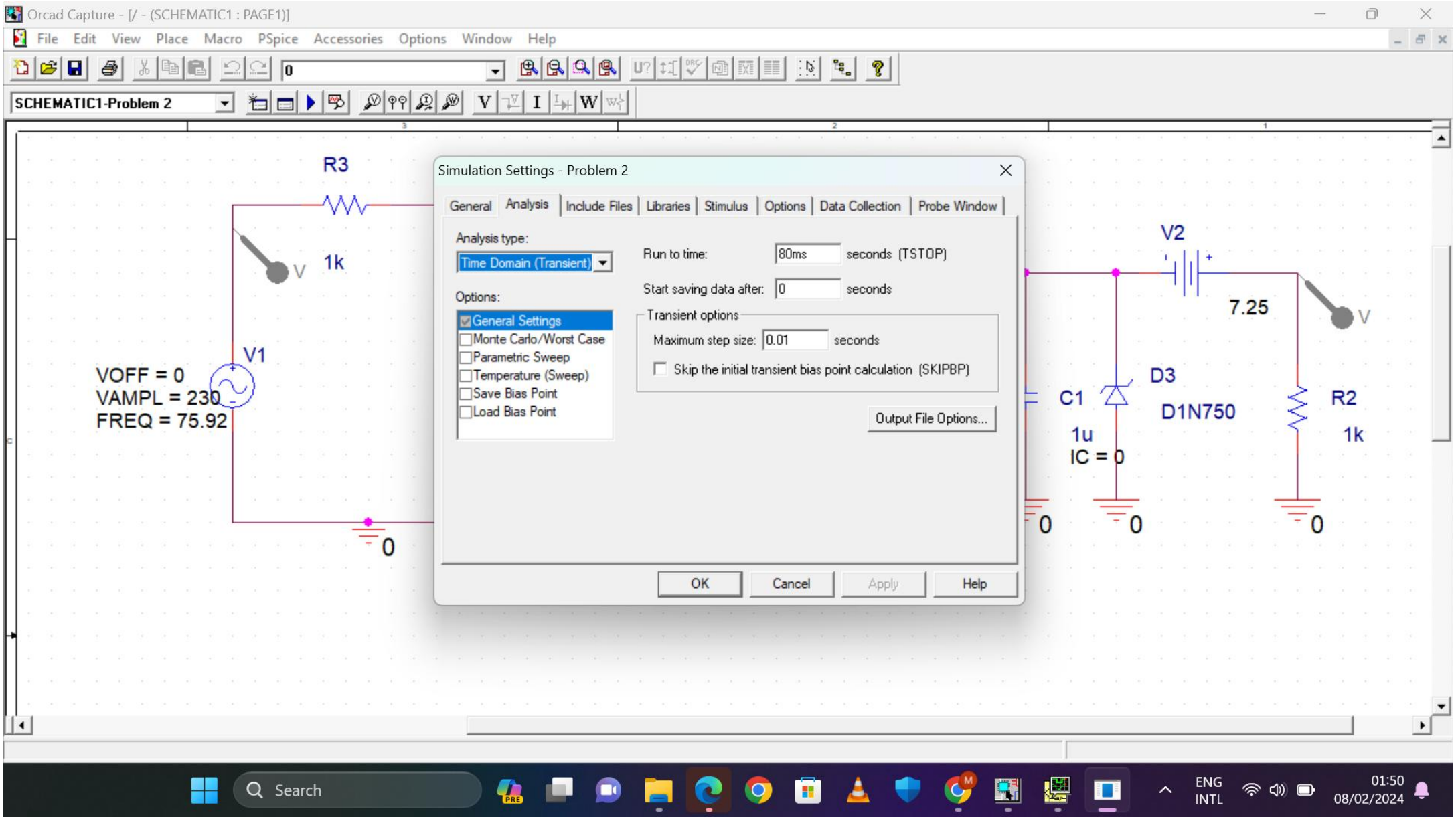
$$2\pi f = 477$$

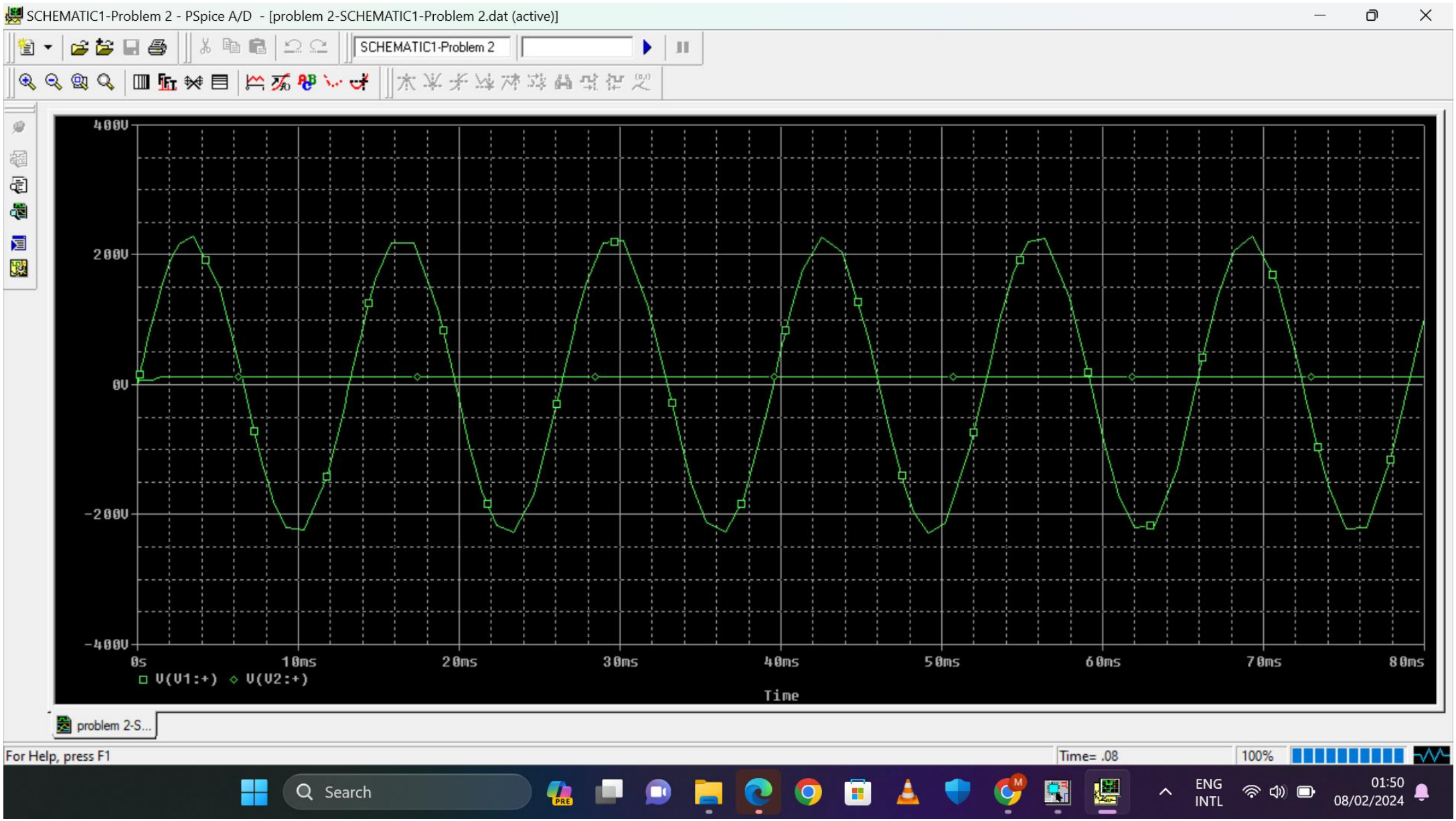
$$\Rightarrow f = \frac{477}{2\pi}$$

$$= 75.92 \text{ Hz}$$

$$V_{out} = 12V$$


Orcad Capture - [/ - (SCHEMATIC1 : PAGE1)]
File Edit View Place Macro PSpice Accessories Options Window Help
SCHEMATIC1-Problem 2
R3
1k
V1
VOFF = 0
VAMPL = 230
FREQ = 75.92
TX1
TX2
L1_VALUE = 18h
L2_VALUE = 0.5h
COUPLING = .999
D1
D1N4001
D2
D1N4001
COUPLING = .999
L1_VALUE = 18h
L2_VALUE = .5h
R1
100
V2
7.25
C1
1u
IC = 0
D3
D1N750
R2
1k
0
0 items selected
Scale=200% X=7.20 Y=3.30
Search
ENG
INTL
01:50
08/02/2024


Orcad Capture - [/ - (SCHEMATIC1 : PAGE1)]
File Edit View Place Macro PSpice Accessories Options Window Help
SCHEMATIC1-Problem 2
R3
1k
V1
VOFF = 0
VAMPL = 230
FREQ = 75.92
0
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
V2
7.25
C1
1u
IC = 0
D3
D1N750
R2
1k
Search
ENG
INTL
01:50
08/02/2024


SCHEMATIC1-Problem 2 - PSpice A/D - [problem 2-SCHEMATIC1-Problem 2.dat (active)]
SCHEMATIC1-Problem 2
400V
200V
0V
-200V
-400V
0s
10ms
20ms
30ms
40ms
50ms
60ms
70ms
80ms
V(V1:+)
V(V2:+)
Time
problem 2-S...
For Help, press F1
Time= .08
100%
Search
ENG
INTL
01:50
08/02/2024