



## LABORATORY WORK SHEET

Name of the Student: MADKI SAI CHARAN

Class: C5M-1C1 Semester: Ist

Course Code: AEEED03 Course Name: Electrical and Electronics Engineering Laboratory

Name of the Course Faculty: M.S. M. VARALAKSHMI

Faculty ID: IARE 11072

Exercise Number: 13 Week Number: 13 Date: 19 January 2024

### DAY TO DAY EVALUATION:

Marks	Aim / Preparation	Algorithm / Procedure	Source Code	Program Execution	Viva - Voce	Total
		Performance in the Lab	Calculations and Graphs	Results and Error Analysis		
Max. Marks	4	4	4	4	4	20
Obtained	4	4	4	4	4	20

Signature of Faculty

### START WRITING FROM HERE:

Aim: Examine the input and output waveforms of a full wave rectifier without and with filters. Calculate the ripple factor with load resistance of  $500\Omega$ ,  $1K\Omega$  and  $10K\Omega$  respectively. Calculate ripple factor with a filter Capacitor of  $100\mu F$  and load of  $1K\Omega$ ,  $2K\Omega$  and  $10K\Omega$  respectively.

### Apparatus:

S.No	DEVICE	RANGE/ RATING	QUANTITY IN NO.
01.	Rectifier and filter trainer board containing a) AC supply b) silicon Diodes c) capacitors	(9-0-9V) (1N 4007) 0-47 $\mu F$	01 07 01
02.	DC Voltmeter AC Voltmeter	(0-20V) (0-20V)	01 01
03	DC Ammeter	(0-50 mA)	01
04.	Cathode Ray Oscilloscope	(0-20 MHz)	01
05.	Decade Resistance box	10 $\Omega$ - 100K $\Omega$	01
06.	Electrolytic Capacitor	100 $\mu F$	01
07.	Connecting Wires	5A	12

# Circuit Diagrams:

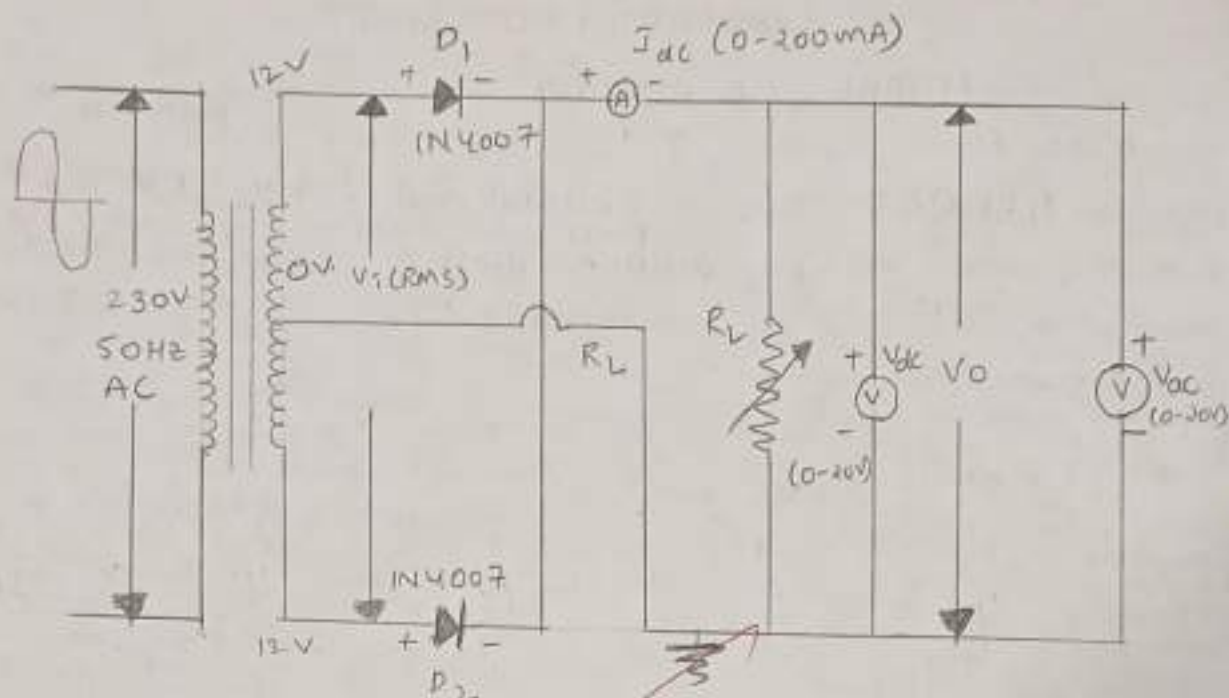


Fig (1): Full Wave Rectifier (Center-tap) without filter

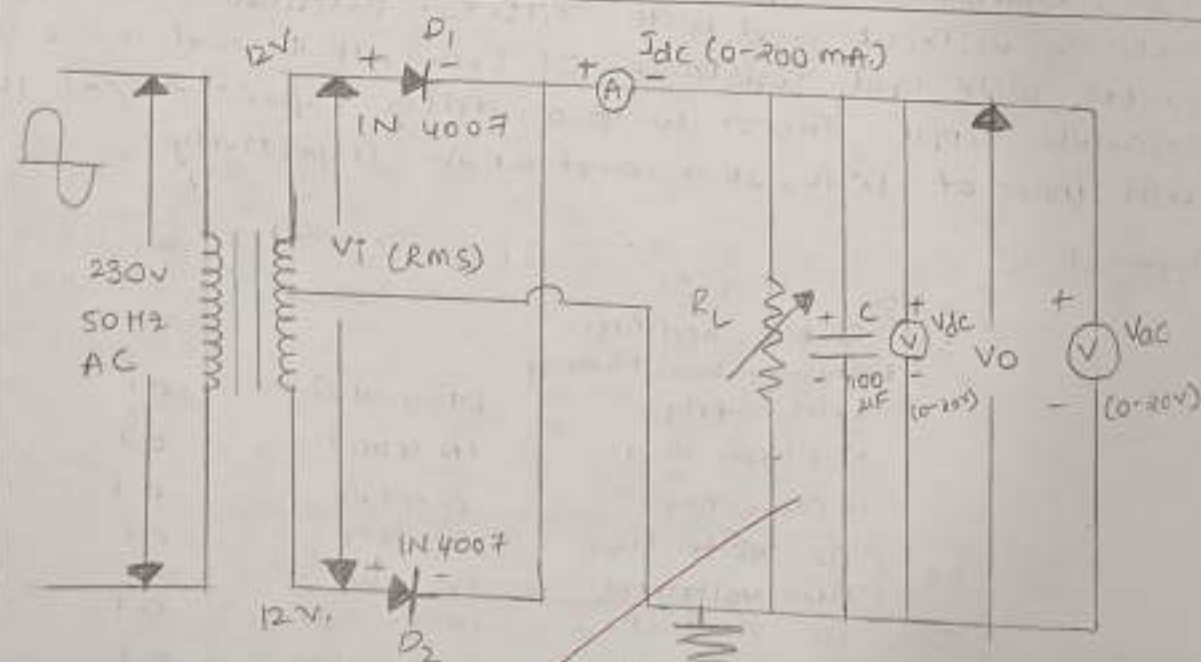


Fig (2): Full Wave Rectifier (Center-tap) with filter

Procedure:Full-wave rectifier without filter

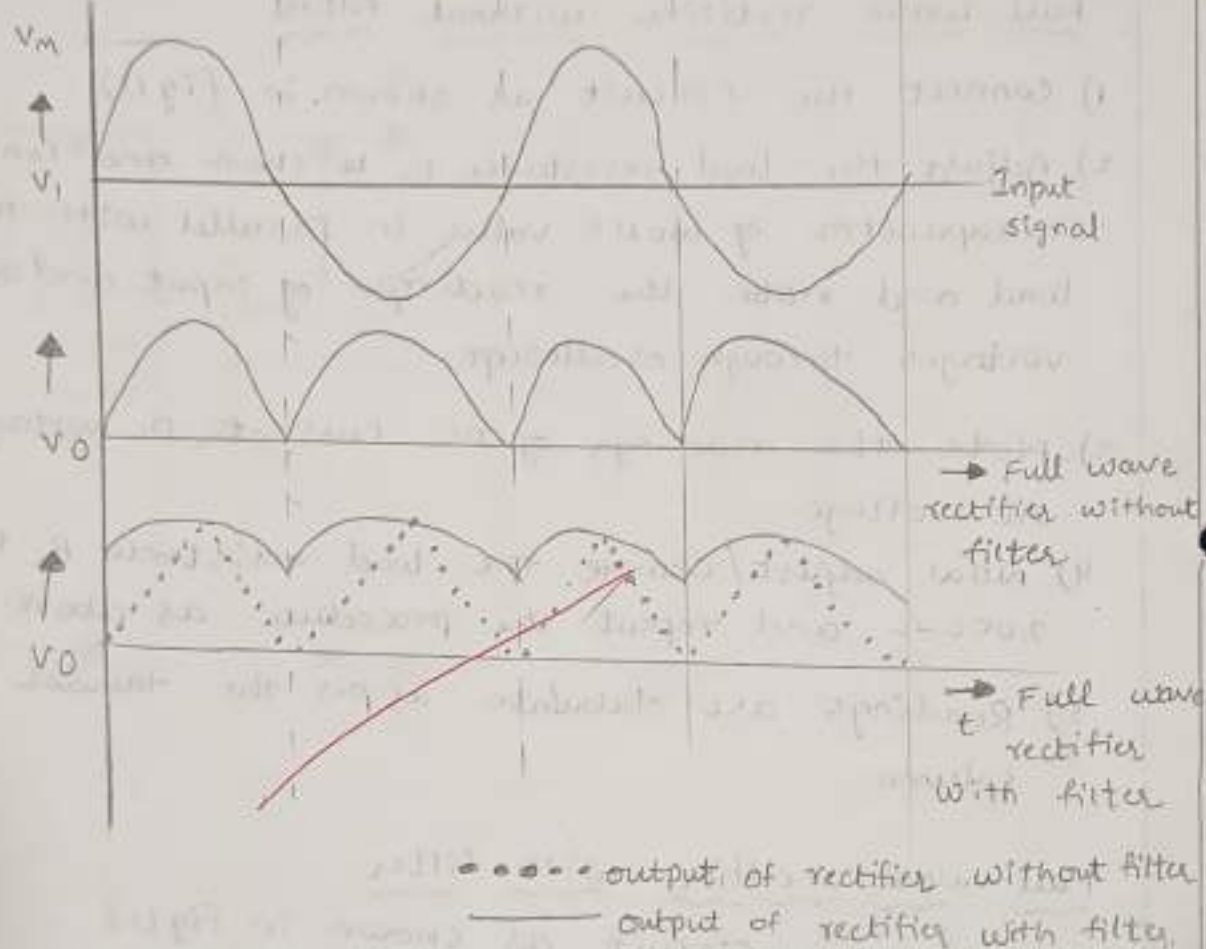
- 1) Connect the circuit as shown in fig(1)
- 2) Adjust the load resistance  $R_L$  to  $500\Omega$  and connect a capacitor of  $100\mu F$  value in parallel with the load and note the readings of input and output voltages through oscilloscope.
- 3) Note the readings of DC current, DC voltage and AC voltage.
- 4) Now adjust/change the load resistance  $R_L$  to  $2000\Omega$  and repeat the procedure as above.
- 5) Readings are tabulate as per the tabular column.

Full-wave rectifier with filter

- 1) Connect the circuit as shown in fig(2).
- 2) Adjust the load resistance  $R_L$  to  $1K\Omega$  and connect a capacitor of  $100\mu F$  values in parallel with load and note the readings of input and output voltage through oscilloscope.
- 3) Note the readings of DC current, DC voltage and AC voltage.
- 4) Now, change the load resistance  $R_L$  to  $2K\Omega$  and repeat the procedure as the above. Also repeat for  $10K$ ,  $100\mu F$  values.
- 5) Readings are tabulate as per the tabular column.



### Expected graphs:



### Precautions:

- 1) No loose contacts at the junction.
- 2) meters of correct range must be used for precision.



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Course Code \_\_\_\_\_ Course Name \_\_\_\_\_

Name of the Course Faculty \_\_\_\_\_ Faculty ID \_\_\_\_\_

Exercise Number \_\_\_\_\_ Week Number \_\_\_\_\_ Date \_\_\_\_\_

Roll Number							
2	3	9	5	1	A	6	F 2

### DAY TO DAY EVALUATION:

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Obtained						

Signature of Faculty

### START WRITING FROM HERE :

Tabular Column:

Full wave rectifier (Center tap) without filter

S. NO	Load Resistance ( $R_L$ )	Input voltage Peak ( $V_{in}$ )	output voltage Peak ( $V_o$ )	Average dc current ( $I_{dc}$ )	Average dc voltage ( $V_{dc}$ )	RMS voltage ( $V_{ac}$ )	Ripple factor $\gamma = V_{ac}/V_{dc}$
1	500 $\Omega$	20.40	19.60	22.9	11.63	6.41	0.536
2	1000 $\Omega$	21.20	20.00	11.8	11.94	6.54	0.547
3	10,000 $\Omega$	21.20	20.40	12.2	12.31	5.162	0.419

Full-wave Rectifier (Center-top) with filter

C-11F

S.NO	Load Resistance ( $R_L$ )	Input voltage Peak ( $V_m$ )	Output voltage Peak ( $V_o$ )	Average dc current ( $I_{dc}$ )	Average dc voltage ( $V_{dc}$ )	RMS voltage ( $V_{ac}$ )	Ripple factor $\gamma = V_{ac}/V_{dc}$
1	500 $\Omega$	19.60	18.00	33.1	16.75	0	0
2	1000 $\Omega$	20.00	19.20	18.0	18.11	0	0
3	10,000 $\Omega$	21.20	20.40	2.0	19.97	0	0

Result:

- 1) Input and output waveforms of a full-wave and bridge rectifier with/without filters are observed and plotted.
- 2) For full wave rectifier without filter -
  - (i)  $\gamma$ , Ripple factor at 500  $\Omega$ , 100  $\mu F = 0.536$ .
  - $1k\Omega$ , 100  $\mu F = 0.547$ .
- 3) For a full wave rectifier with filter -
  - (ii)  $\gamma$ , Ripple factor at 500  $\Omega$ , 100  $\mu F = 0$ .
  - $1k\Omega$ , 100  $\mu F = 0$ .