IARE

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INSTITUTE OF AERONAUTICAL ENGINEERING
(An Autonomous Institute affiliated to JNTUH, Hyderabad)
Dundigal, Hyderabad - 500 043

LABORATORY WORK SHEET

Name of the Student : Abdul Basith Khan

Class 1st Year (CSM-A) Semester I st

Roll Number									
2	3	9	5	1	A	6	6	0	1

Course Code : AEED01 Course Name : EEE Laboratory

Name of the Course Faculty Dr. L Rajashekhar Goud Faculty ID IARE11067

Exercise Number : 12 Week Number : 12 Date : 22/01/2024

DAY TO DAY EVALUATION:

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

Signature of Faculty

START WRITING FROM HERE : HALF WAVE RECTIFIER WITH/WITHOUT FILTER:-

Aim:-

Examine the input and output wave forms of a half wave rectifier without and with filters. Calculate the ripple factor of 500 Ω, 1KΩ. & 10 KΩ respectively. Calculate ripple factor with a filter capacitor of 100 MF and the load of 1K Ω, 2KΩ. & 10 KΩ respectively.

Apparatus Required:-

S.No.	Device	Range	Quantity in No.
1.	Rectifier and Filter trainer Board containing a) AC supply b) Silicon Diodes c) Capacitor	(12-0-12)V IN4007 100 MF	1 1 1
2.	a) DC Voltmeter b) AC Voltmeter	(0-20)V (0-20) V	1 1

ROLL NUMBER :

3.	DC Ammeter	(0-200) mA	1
4.	Cathode Ray	(0-20) mHz	1
5.	Decode Resistance Box	10Ω - 10KΩ	1
6.	Connecting Wires	5A	12

Circuit Diagram:-

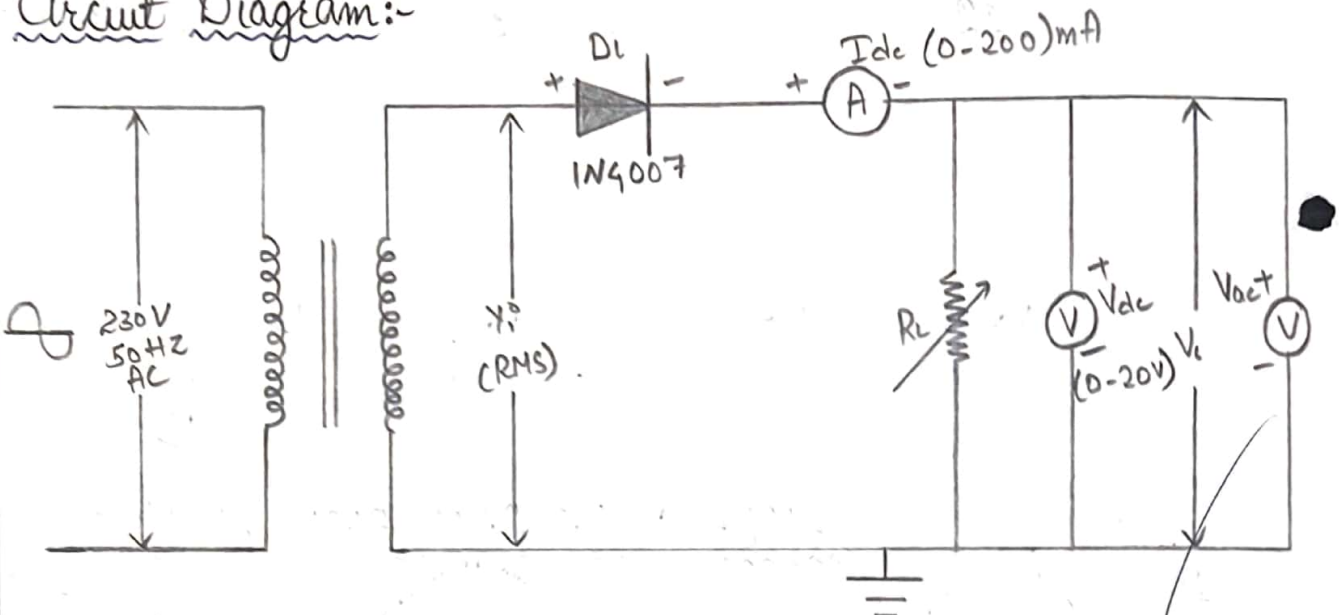


Fig-12.1 Half wave Rectifier Without Filter.

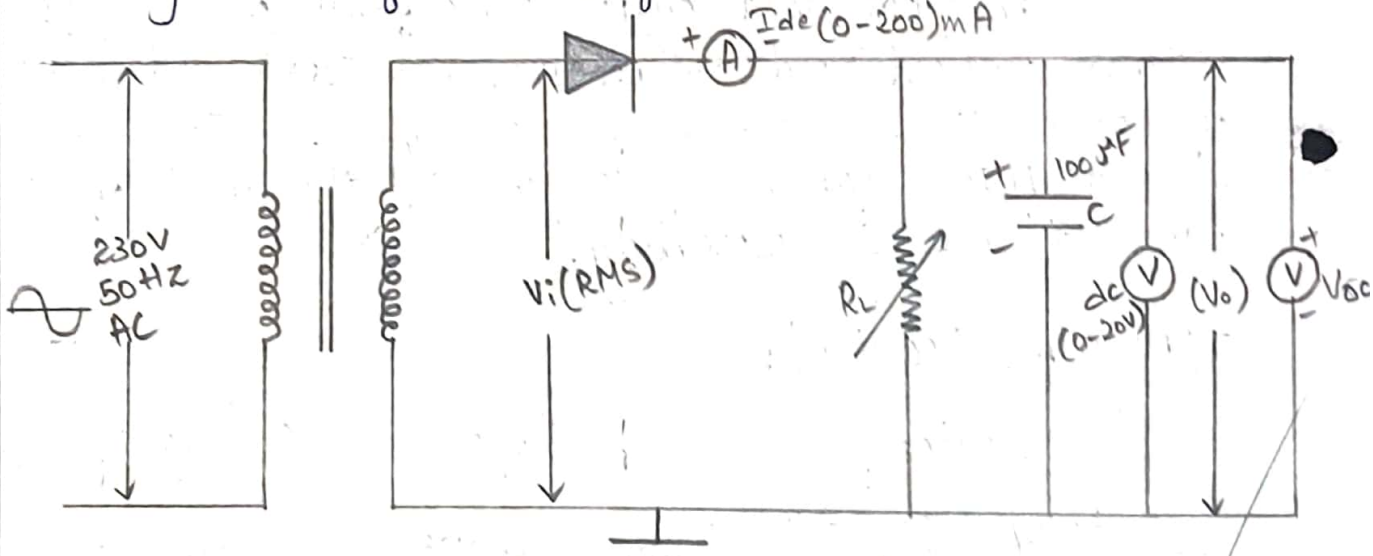


Fig 10.2 Half wave Rectifier with filter.

Procedure:-

* Half Wave rectifier without filter:-

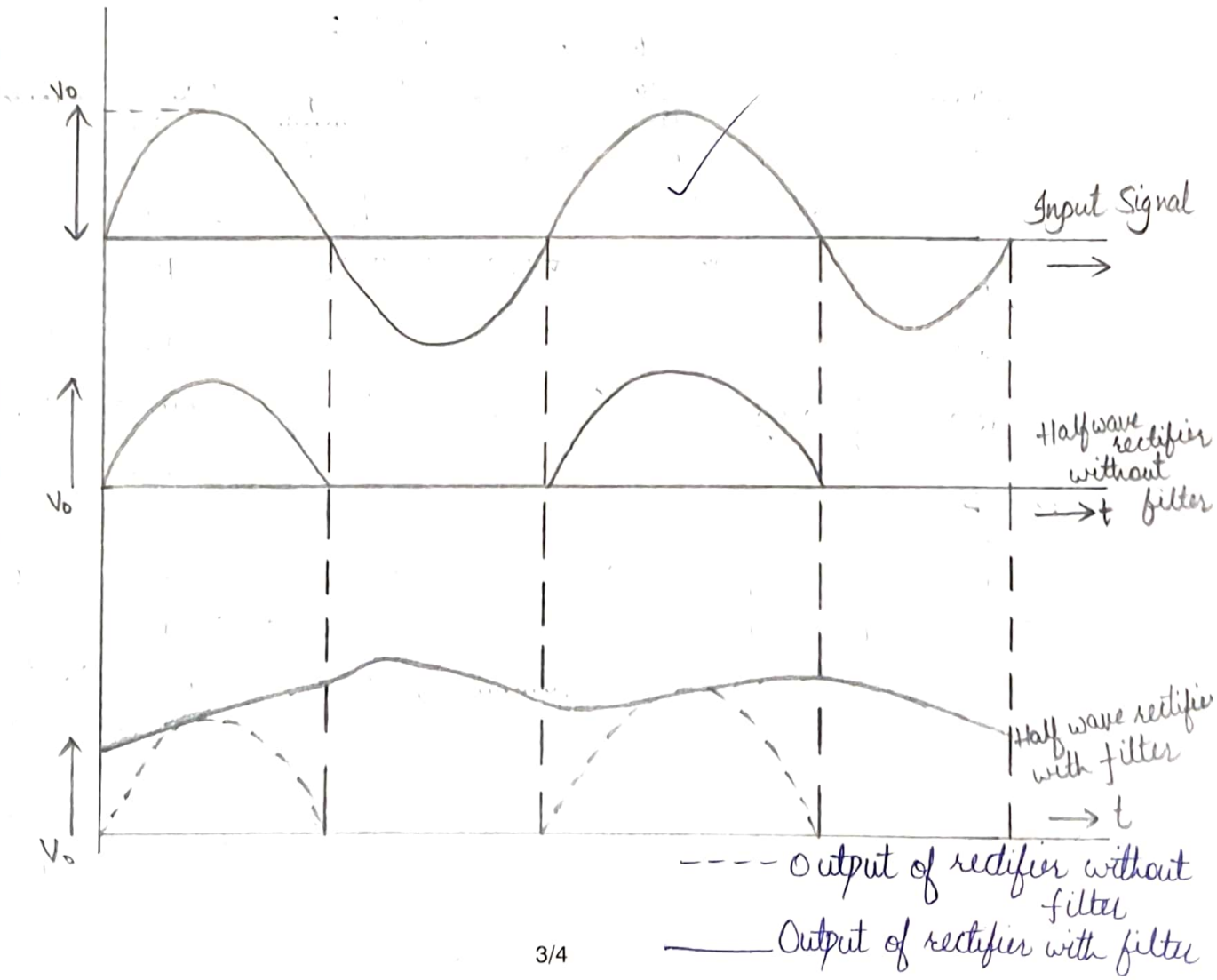
ROLL NUMBER :

1. Connect the circuit as shown in Fig-10.1
2. Adjust the load resistance to R_L 500 Ω and note down the readings of input and output voltages through Oscilloscope
3. Note the readings of DC current. DC voltages and AC Voltage.
4. Now change the load resistance R_L to 1KΩ and repeat the procedure as above. Also repeat for 1KΩ
5. Readings are tabulated as per the tabutes column.

*Half Wave Rectifier With filter:-

1. Connect the circuit as shown in fig-10.2 and repeat the procedure as for half wave rectifier without fitter.

Expected Graphs:-



ROLL NUMBER :

Precautions:-

1. No loose contacts at the junctions.
2. Meters of correct range must be use for precision.

Tabular Columns:-

Half wave rectifier without filter :-

S.No	Load Resistance (R_L) Ω	Input Voltage Peak (V_m)	Output Voltage Peak (V_o)	Average DC Current (I_{de}) (A)	Average DC Voltage (V_{de}) (V)	RMS Voltage (V_{ac})	Ripple factor $\gamma = V_{ac}/V_{dc}$
1.	100 Ω	18.00	16.40	49.8	4.93	6.19	1.24
2.	220 Ω	20.00	18.40	26.0	5.48	6.90	1.25
3.	470 Ω	20.40	20.00	12. 2	5.76	7.06	1.22
4.	1000 Ω	20.80	20.00	5.9	5.90	7.47	1.26

Half wave rectifier with filter :-

S.No	Load Resistance (R_L) Ω	Input Voltage Peak (V_m)	Output Voltage Peak (V_o)	Average DC Current (I_{dc}) (A)	Average DC Voltage (V_{de}) (V)	RMS Voltage (V_{ac})	Ripple factor $\gamma = V_{ac}/V_{dc}$
1.	100 Ω	16.40	15.60	19.2	7.78	3.64	0.46
2.	220 Ω	18.00	16.80	51.3	11.20	2.70	0.24
3.	470 Ω	18.80	18.00	30.3	14.1	1.55	0.09
4.	100 Ω	20.00	18.00	16.4	16.3	0.14	8.58

Result:-

1. Input and output wave forms of a half-wave rectifier with/without filter are observed and plotted.
2. For half wave rectifier without filter – γ Ripple factor
   470 Ω = 1.22
   100 Ω = 1.24
   220 Ω = 1.25
3. For half wave rectifier with filter – γ Ripple factor at
   200 KΩ, 100 MF = 0.24
   100 KΩ, 100 MF = 8.58

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