SHEET NO. 1

Answer Book for Main Examination

Pl.Note: No Provision of Supplementary Answer Book

(to be filled by the candidate)

[Write only the desired information. Any other information provided on the sheet will be treated as unfair means]

Year/Semester: 2022-23 / 3 (III)

Branch: I.T.

Subject/Paper: E.D.C.

Subject/Paper Code: 3E1651

Day & Date of Examination: Tuesday & 12/09/23

CONTROLLER OF EXAMINATIONS Rajasthan Technical University

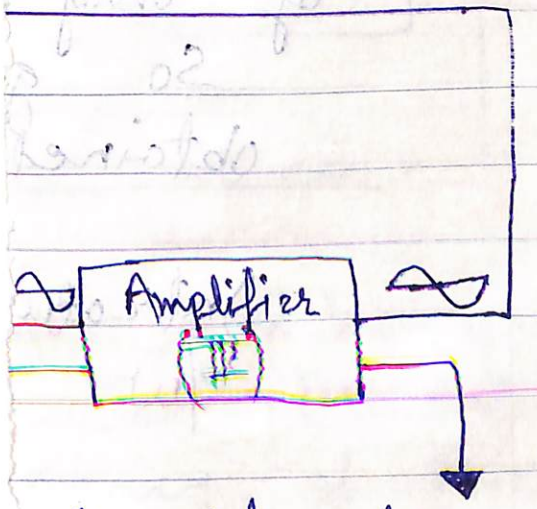
Facsimile Seal of Controller/Director of Exam

Evaluation Sheet

Q. No.	Marks obtained					Total
	a	b	c	d	e	
1						
2						
3						
4						
5	6	5				11
6						
7						
8						
Grand Total (in figure)						

Grand Total (in words)

...io frequency
...vantage is
...stage R-C coupled
...back network.
shown below:→



Network

Parallel

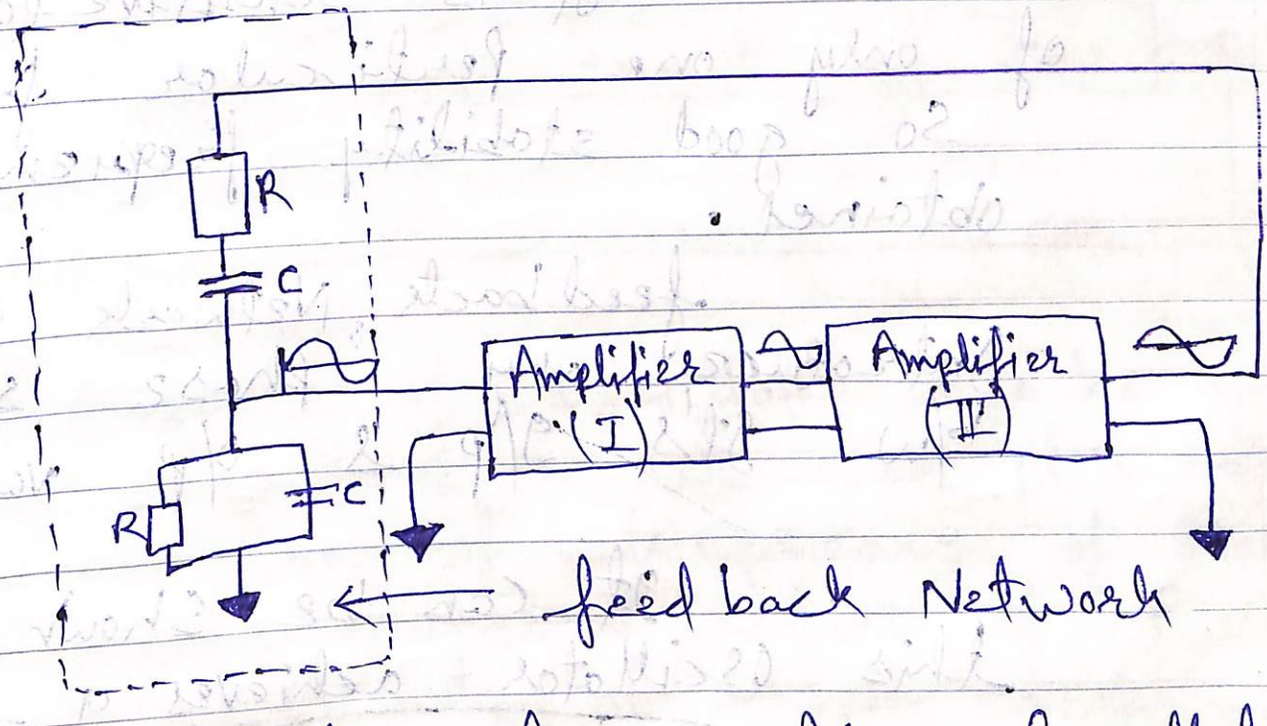
fed to the Input

(* Last Page)

[Unit - V]

5. (a) Wein bridge Oscillator →

This is an Audio frequency R-C Oscillator. It's Advantage is frequency may be two stage R-C Coupled Amplifier and a feed back network. The block diagramme is shown below:→



The voltage Across the Parralled Combination of R and C is fed to the Input

of Amplifier (I). The Net phase shift to two Amplifier is zero. Amplifier (I) will Amplify Signal over a Wide Range of frequency. is direct coupling would Result in Poor frequency stability by Adding wein bridge Oscillator Network.

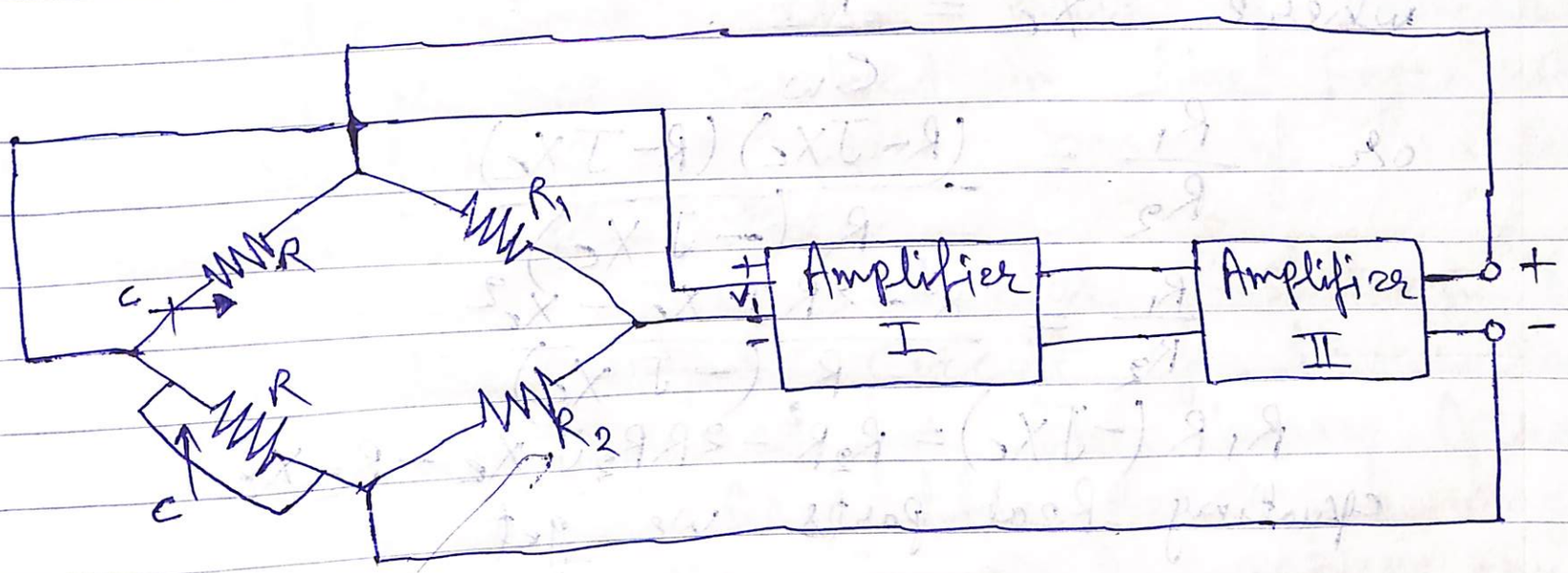
It is Sensitive to Signal of only one Particular frequency So good stability frequency is obtained.

feedback Network Should not Introduce any phase shift b/w it's i/p & o/p voltage.

It can be Shown that this Oscillator achieves a frequency.

$$f = \frac{1}{2\pi RC}$$

obtained by two Resistance R_1 & R_2 in feedback Network. Shown below



frequency of Oscillator can be varied by two capacitor. We can Also change the Range of frequency of Oscillator by using different values of R.

frequency of oscillation ⇒

figure in balanced Network

$$\frac{R_1}{R_2} = \frac{R - JX_C}{\left[R(-JX_C)/(R-JX_C)\right]}$$

where $X_C = \frac{1}{C\omega}$

or $$\frac{R_1}{R_2} = \frac{(R-JX_C)(R-JX_C)}{R(-JX_C)}$$

$$\frac{R_1}{R_2} = \frac{R^2 - 2RJX_C - X_C^2}{R(-JX_C)}$$

$$R_1 R(-JX_C) = R_2R^2 - 2RR_2JX_C - R_2X_C^2$$

equating Real parts we get

$$R_2R^2 = R_2X_C^2 \quad \text{or} \quad X_C = R$$

$$\frac{1}{C\omega} = R \quad \text{or} \quad \omega = \frac{1}{CR}$$

(6)

$$\boxed{F = \frac{1}{2\pi CR}}$$

where F is frequency of Oscillation

Sol. (b) Schmitt Trigger using BJT →

This circuit is preferred wherever free base terminal is required. due to the fact the base of transistor Q_1 is not involved in the Regenerative Switching & the base of transistor Q_1 is thus free.

The collector Resistance R_4 in the output circuit of transistor Q_2 is not required for the binary Operation So this Resistance may be Suitably choosen So as to achieve any desire amplitude of Output voltage

1. As a Squaring circuit it can convert Input of any wave shape into Output pulse of Rectangular or Square wave shape
2. Amplitude Comparator or level detector in Schmitt trigger

circuit a change of state occur
3. As a flip flop circuit
4. Reshaping the worn out pulses by giving them sharp leading and trailing edges.

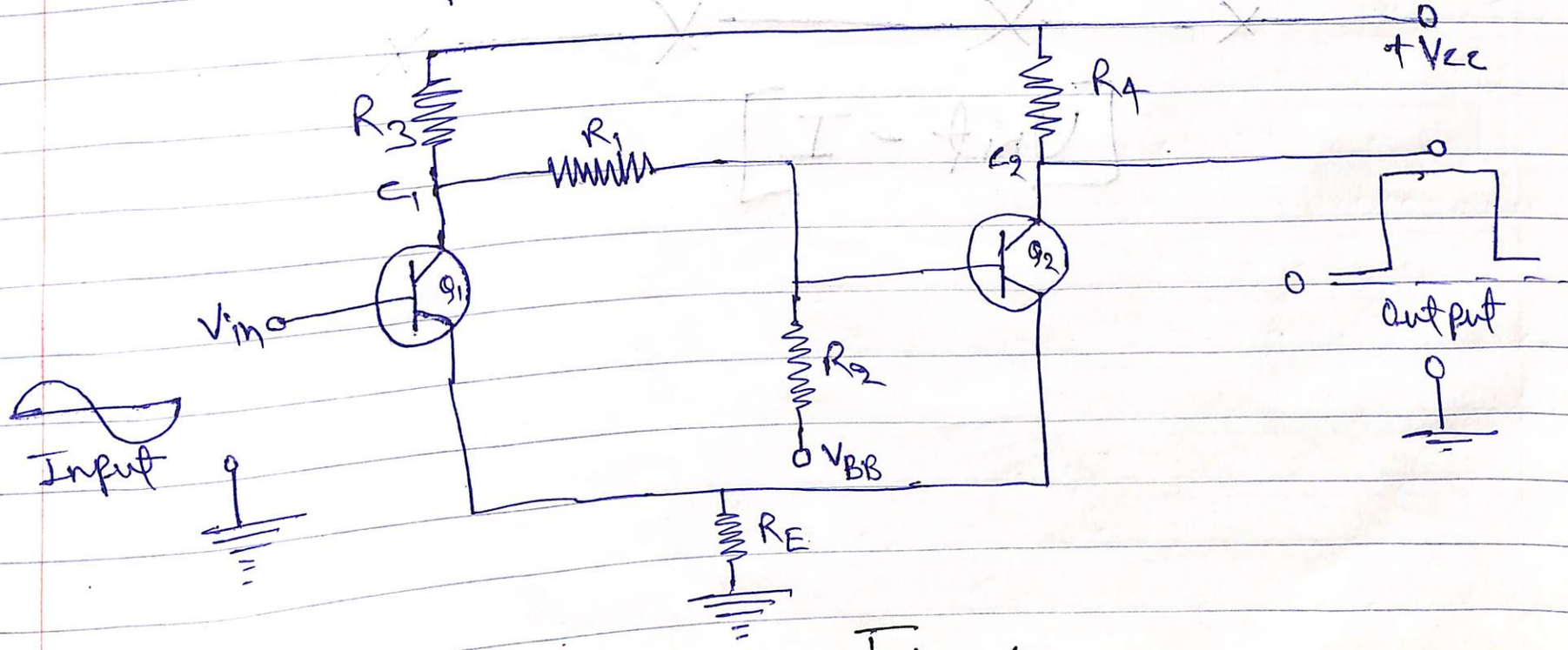
Working → when power supply is switch on for first time, Resistor R_1, R_3, R_2 forming a potential devider across V_{cc} and $-V_{BB}$ forward biases slightly the transistor Q_2 and Q_2 start conducting. ~~Re~~ ~~from~~

Q_1 is now Reverse biased due to flow of current in emmitor Resistance R_E from transistor Q_2.

Initial static Condition

transistor Q_1 is in cut-off & transistor Q_2 is in Saturation

Input ac Signal is Applied to base of Q_1 s If it has strength to Overcome & Reverse bias Placed on Q_1 due to voltage drop across emitter Resistor R_E, Q_1 is forward bias. Q_1 is start Conducting, Collector C_1 is potential drop, Nagative going coupled to base of Q_2 via R_1. Reduce forward bias and consequences emmitter current.



Figure

Figure

Thus one cycle is completed. This cycle is Repeated as Input ac signal Repeat 9th cycle.

(5) positive going Pulses are generated at the output of Schmitt trigger for each cycle of the Schmitt trigger

[Unit - I]