FINAL YEAR PROJECT REPORT
DIPLOMA IN ELECTRONICS ENGINEERING
SCHOOL OF ENGINEERING
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SHAH ALAM SELANGOR

CAPACITANCE METER

BY

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PREFACE

CAPACITANCE are among the most common components used in electronics today. The capacitance meter which I have constructed will be function well when all the construction is completed. Once the component is connected between the test terminal, the display will directly give the reading, without any help from external operator or switch apart from the power switch apart from the power switch.

It can be used to measure both electrolytic and non-electrolytic capacitor. The range which can be measured by this meter is 100pF for the minimum range and for the maximum range is 100mF.

ACKNOWLEDGMENT

First and foremost I would like to forward my sincere thanks and gratitude to my project supervisor PUAN KARTINI SALAM who helped me in the analysis of the project. Her comments toleration and suggestion has done a lot in further understanding and improvement of the project.

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1.0 INTRODUCTION

1.1.0 Theory

Consider a capacitance C charging through a resistor R from a supply voltage Us as shown. In Fig 1, the voltage on the capacitor, U_s may be written as

$U_c = U_s (1 - e)$

where e is the base of natural logarithms or 2.718282.

Rearranging:-

$$\frac{1-U_c}{U_s} = \text{constant or } C = kt$$

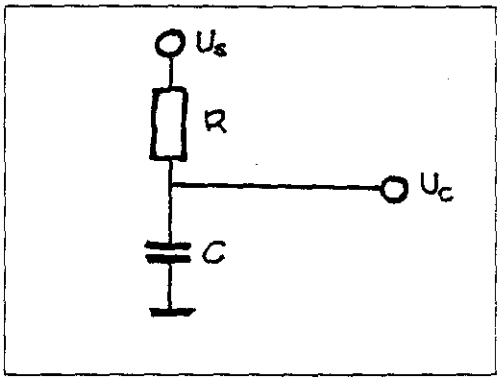

Fig 1: Basic Capacitor Charging Circuit. Bothe Us and Uc are measured w.r.t. ground

Rearranging and taking natural logarithms

$$R\ln\left\{\frac{Uc}{Uc-Us}\right\}_c^t$$

If we make R, Uc and Us constants then the lefthand side of the equation becomes a constant term. So:-

$$\frac{t}{c} = \text{constant or } C = Kt$$