

GLP-F020

اسم القسم: هندسة تقنيات الأجهزة الطبية / اسم المختبر: التقنيات الرقمية / المرحلة: الثانية / رمز المختبر: BL 304

سجل التجارب للعام الدراسي 20 24 - 20 23

رقم التجربة :- **Experiment No.3**

اسم التجربة : **Boolean algebra**

الغرض من التجربة :-

To study the axioms defining Boolean algebra and how to represent Boolean expressions in POS (product- of – sums) form.

طريقة العمل :

Digital systems are composed of combinations of logic gates described by a truth table and Boolean expression or a logic symbol diagram. The fundamental Boolean identities for AND, OR and NOT operations can be summarized as follows: -

$A+B=B+A$	$A. B=B.A$
$A+(B+C)=(A+B)+C$	$A.(B.C)=(A.B).C$
$A.(B+C)=A.B+A.C$	$A+B.C=(A+B).(A+C)$
$A+0=A$	$A.1=A$
$A+1=1$	$A.0=0$
$A+A=A$	$A.A=A$
$A+\overline{A}.B=A+B$	$A.(A+B)=A$
$A.B+A.C=A.(B+C)$	$(A+B).(A+C)=A+B.C$

In combinational logic, the output of the circuit depends only on the inputs to the circuit. Combinational logic problems are normally given in the form of logical statements or a truth table. To design and implement the problem, Boolean logical expressions (equations) are derived for the output logic function in terms of the binary variables representing the inputs. The logic expressions are given either in the forms of a sum of products (SOP) or in the form of a product of sums (POS).

