



OMEGA TYPE LTB-845 Logic Gates Circuit Trainer offers a unique entry into the world of microelectronics. The system combines simple, easy to use, ICs for various gates and flip-flops, power supply, clock input and output state with a versatile solder less bread board area. Students new to digital electronics can implement logic circuits in a matter of minutes on the bread board area. As confidence grows the student will naturally progress for using more complex logic ICs on the large bread board area.

This unique approach enables the unit to be used by the absolute beginner, yet it may also be usefully employed in advanced project work. The many outstanding features of the logic trainer, combined with its ease of use and robust housing, make it the first choice for those wishing to introduce students to digital electronics for the first time.

Practical experience on this board carries great educative value for Science and Engineering Students.

OBJECT:

- 01 Study of basic logic gates & verification of their truth table :
 - 1.1 Study of OR gate & verification of truth table using IC-7432.
 - 1.2 Study of AND gate & verification of truth table using IC-7408.
 - 1.3 Study of NOT gate & verification of truth table using IC-7404.
 - 1.4 Study of NAND gate & verification of truth table using IC-7400.
 - 1.5 Study of NOR gate & verification of truth table using IC-7402.
 - 1.6 Study of EXCLUSIVE OR (EX-OR) gate & verification of truth table using IC-7486.
 - 1.7 Study of 3-INPUT NOR gate & verification of truth table using IC-7427.
 - 1.8 Study of 3-INPUT AND gate & verification of truth table using IC-7411.
- 02 Verification of Boolean Algebra and Demorgan's Theorems.

2.1 Theorem $A+0=A$	2.2 Theorem $A \cdot 1=A$	2.3 Theorem $A+1=1$
2.4 Theorem $A \cdot 0=0$	2.5 Theorem $A+A=A$	2.6 Theorem $A \cdot A=A$
2.7 Theorem $A+\bar{A}=1$	2.8 Theorem $A \cdot \bar{A}=0$	2.9 Theorem $A \cdot (B+C)=AB+AC$
2.10 Theorem $A+BC=(A+B) \cdot (A+C)$	2.11 Theorem $A+AB=A$	2.12 Theorem $A \cdot (A+B)=A$
2.13 Theorem $A+\bar{A}B=(A+B)$	2.14 Theorem $A \cdot (\bar{A}+B)=AB$	2.15 Theorem $AB+\bar{A}B=A$
2.16 Theorem $(A+B) \cdot (A+\bar{B})=A$	2.17 Theorem $AB+\bar{A}C=(A+C) \cdot (\bar{A}+B)$	
2.18 Theorem $(A+B) \cdot (\bar{A}+C)=AC+\bar{A}B$	2.19 Theorem $AB+\bar{A}C+BC=AB+\bar{A}C$	
2.20 Theorem $(A+B) \cdot (\bar{A}+C) \cdot (B+C)=(A+B) \cdot (\bar{A}+C)$		
2.21 DeMorgen's Theorem- I $\overline{A \cdot B \cdot C}=\bar{A}+\bar{B}+\bar{C}$	2.22 DeMorgen's Theorem- II $\overline{A+B+C}=\bar{A} \cdot \bar{B} \cdot \bar{C}$	
- 03 To study Arithmetic operations with truth table of the following
 - 3.1 Operation of Half-Adder with truth table
 - 3.2 Operation of Half- Subtractor with truth table.
 - 3.3 Operation of Full-Adder with truth table

Continue__ 2

We are committed to the continuous development of our products, and therefore reserve the right to amend specifications without prior notice.

OMEGA ELECTRONICS

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- 3.4 Operation of Full - Subtractor with truth table
- 04 Verification of D-type flip-flops and truth table using IC-7474.
- 05 Verification of J-K flip-flops and truth table using IC-7476.
- 5.1 Operation of Preset & Clear in J-K flip-flop.
- 5.2 Operation of J-K flip-flop.
- 06 Verification of J-K master slave flip-flops and truth table using IC-4027.

SPECIFICATIONS

- 01 OUTPUT D.C. VOLTAGE : Fixed 5V \pm 1%.
- 02 OUTPUT CURRENT : 1 Amp.
- 03 LOAD REGULATION : \pm 1% of the highest specified output voltage.
NO LOAD TO FULL LOAD)
- 04 LINE REGULATION : less than 5 mV.
(For \pm 10% change in mains Voltage i.e. 230V)
- 05 RIPPLE AND NOISE : less than 5 mV.
- 06 CLOCK PULSE : Clock pulse of 1 second.(1Hz)
- 07 INPUT LOGIC SWITCH (HI/LO) : Four nos. Input voltage of HI level \approx 3.25V. Input voltage of LO level \approx 0.8V.
- 08 OUTPUT INDICATORS : Maximum input voltage less than or equal to 5V D.C.
- 09 SOLDER LESS BREAD BOARD : Unique solder-less large size, spring loaded breadboard consisting of two Terminal Strips with 1280 tie points and 4 Distribution Strips with 100 tie points each, totaling to 1680 tie points. (Size:112mm x 170mm approx)
- 10 BASIC LOGIC GATES & FLIP FLOP UNITS : Four AND gates, Four OR gates, Four NAND gates, Four NOR gates, Six NOT gates, Dual J-K Flip-Flop, J.K. master slave Flip-Flop & Dual D-type Flip Flop.
- 11 IC's PROVIDED : 11 IC's have been provided.
- 12 Mains ON/OFF switch, Fuse and Jewel light.
- 13 The unit is operative on 230VAC \pm 10% at 50Hz.
- 14 Good Quality, reliable terminal/sockets are provided at appropriate places on panel for connections / observation of waveforms.
- 15 Strongly supported by detailed Operating Instructions, giving details of Object, Theory, Design procedures, Report Suggestions and Book References.
- 16 Weight : 3.800 Kg. (Approx).
- 17 Dimension : W 340 x H 125 x D 210

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