

**DIGITAL SYSTEM  
DESIGN (DSD)  
LAB**

## **DIGITAL SYSTEM & DESIGN LAB**

DIGITAL SYSTEM DESIGN IS FOR VI SEM STUDENTS. THIS SUBJECT DEVELOPS SOFTWARE PROGRAM FOR VARIOUS COMBINATIONAL CIRCUIT EXAMPLES ADDERS, DECODERS, ENCODERS. OTHER EXPERIMENTS INCLUDE PROGRAM FOR VARIOUS SEQUENTIAL CIRCUIT, FOR EXAMPLE MULTIPLEXER, DEMULTIPLEXER, REGISTERS, COUNTERS. ETC. SO BASICALLY THIS LAB DEPENDS ON THE KNOWLEDGE OF DIGITAL ELECTRONICS WHICH STUDENTS HAVE STUDIED IN EARLIER SEMESTER. IN THIS LAB STUDENTS PERFORM TEN EXPERIMENTS AS PER UNIVERSITY PRESCRIBED SYLLABUS. FIRSTLY THEORY AS WELL AS LOGIC FOR SOFTWARE PROGRAM IS EXPLAINED IN THE CLASS & LATER WHEN STUDENTS ATTEND THE LAB THEY IMPLEMENT THOSE PROGRAMS. THE SOFTWARE USED IN THIS LAB IS VHDL (VERY HIGH SPEED INTEGRATED CIRCUIT HARDWARE DESCRIPTION LANGUAGE).

### **LIST OF EXPERIMENTS**

1. DESIGN ALL GATES USING VHDL.
2. WRITE VHDL PROGRAMS FOR THE HALF ADDER CIRCUIT, CHECK THE WAVE FORMS AND THE HARDWARE GENERATED
3. WRITE VHDL PROGRAMS FOR THE FULL ADDER CIRCUIT, CHECK THE WAVE FORMS AND THE HARDWARE GENERATED
4. WRITE VHDL PROGRAMS FOR THE FOLLOWING CIRCUITS, CHECK THE WAVE FORMS AND THE HARDWARE GENERATED  
A) MULTIPLEXER    B) DEMULTIPLEXER
5. WRITE VHDL PROGRAMS FOR THE FOLLOWING CIRCUITS, CHECK THE WAVE FORMS AND THE HARDWARE GENERATED  
A) DECODER    B) ENCODER
6. WRITE A VHDL PROGRAMS FOR A COMPARATOR AND CHECK THE WAVE FORMS AND THE HARDWARE GENERATED.
7. WRITE A VHDL PROGRAMS FOR A CODE CONVERTER AND CHECK THE WAVE FORMS AND THE HARDWARE GENERATED.
8. WRITE A VHDL PROGRAMS FOR A FLIP-FLOP AND CHECK THE WAVE FORMS AND THE HARDWARE GENERATED.
9. WRITE A VHDL PROGRAMS FOR A COUNTER AND CHECK THE WAVE FORMS AND THE HARDWARE GENERATED
10. WRITE VHDL PROGRAMS FOR THE FOLLOWING CIRCUITS, CHECK THE WAVE FORMS AND THE HARDWARE GENERATED  
A) REGISTER    B) SHIFT REGISTER

