CAPACITY OF MEMORY

- Memories are identified by:
  - no. of words * word size
- no. of words = power of 2

2^M X N
M address bits N data bits

2^M = no. of words or address locations
N = word size
FIFO

- Formed by the arrangement of shift registers.
- First data bit written into memory is first to be read out.
- Can be used in case where two systems of different data rates must communicate.

LIFO

- Last in first out
- Last data to be stored is first to be retrieved.
- Found in applications involving microprocessors (stack) and other computing systems.
4. GAL (Generic Array Logic)

- Innovation of PAL and has same logical properties as PAL but can be erased and reprogrammed.
- Very useful in prototyping stage of design where any bugs can be corrected by reprogramming.
- Consists of reprogrammable AND array and a fixed OR array with programmable output configurations (these are two differences between PAL and GAL).
- Uses $E^2C M O S$ (Electrically Erasable CMOS) technology instead of Bipolar technology and fusible links.
LOGICAL FAMILIES
TRANSISTOR TRANSISTOR LOGIC (TTL)

- Based on BJT technology
- Appropriate in SSI and MSI circuits
- Good noise performance
- Power dissipation high
- Large Propagation delay
- Less packing density, so large fabrication area required
- Not sensitive to ESD (Electrostatic Discharge)
- Fan out/in 10/6
- Used in many applications such as computers, industrial controls, test equipment and instrumentation, consumer electronics, synthesizers
INTEGRATED INJECTION LOGIC (I\textsuperscript{2}L)

✓ Merged Transistor Logic
✓ Based on BJT technology
✓ Used in LSI circuits
✓ High packing density
✓ Less power dissipation as no use of resistors
✓ Propagation delay large
✓ Low logical swing
✓ Lower noise immunity
✓ Not sensitive to ESD
FOURTEEN SEGMENT DISPLAY

- Referred to as a starburst display or a "Union Jack" display
- Display based on 14 segments that can be turned on or off to produce letters and numerals
- Having an additional four diagonal and two vertical segments with the middle horizontal segment broken in half.