

Tribhuvan University  
**Institute of Science and Technology**  
 2070  
 ☆

Bachelor Level / First Year/ Second Semester/ Science  
**Computer Science and Information Technology (CSc 151)**  
(Digital Logic)

Full Marks: 60  
 Pass Marks: 24  
 Time: 3 hours.

*Candidates are required to give their answers in their own words as far as practicable.  
The figures in the margin indicate full marks.*

**Long Answer Questions:**

Attempt any two questions.

(2x10=20)

1. Explain magnitude comparator and also design a logic diagram for a 4 bit magnitude comparator.
2. What do you mean by ripple counter? Explain with timing diagram.
3. Explain the full subtractor with using decoder.

**Short Answer Questions:**

Attempt any eight questions.

4. Design a half adder logic using only NAND gates.
5. Convert the following decimal numbers into hexadecimal and octal.  
 (a) 334      (b) 225
6. Explain the k-map with three variables.
7. Explain the combinations logic with example.
8. Differentiate between Multiplexer and Demultiplexer.
9. Mention the difference types of shift registers.
10. What do you mean by Ripple counter.
11. Explain the decoder and design with universal gates.
12. What do you mean by clocked RS flip-flop? Explain.
13. Write short notes on any two:  
 (a) Flip flop  
 (b) Synchronous counter  
 (c) Digital systems