

**Tribhuvan University**  
**Institute of Science and Technology**  
**2065**

Bachelor Level/ First Year/ First Semester/ Science  
**Computer Science and Information Technology (CSc. 111)**  
(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 Questions:**

**Attempt any two questions: (2 × 10=20)**

1. Draw a block diagram, truth table and logical circuit of a 16 x 1 multiplexer and explain its working principle.
2. Explain the 4-bit ripple counter and also draw a timing diagram.
3. Design the full subtractor circuit with using Decoder and explain the working principle.

**Short Questions:**

**Attempt any eight questions: (8 × 5=40)**

4. Design a half adder logic circuit using only **NOR** gate.
5. Convert the following decimal numbers into hexadecimal and octal number.  
    **(a)** 304  
    **(b)** 224
6. Describe the three-variable K-map with example.
7. Design the Decoder using Universal gates.
8. What is combinational logic? What are its important features?
9. Describe the clocked RS flip-flop.
10. What do you mean by triggering of flip-flop?
11. What are the shift Register operations?
12. Describe the Ripple counter.
13. Write short notes on:  
    **(a)** Registers.  
    **(b)** Digital.  
    **(c)** EBCDIC.