Tribhuvan University
Institute of Science and Technology
2068

Bachelor Level/ First Year/ First Semester/ Science — Full Marks: 60
Computer Science and Information Technology (CSc. 111) — Pass Marks: 24
(Digital Logic) — Time: 3 hours.

Candidates are required to give their answers in their own words as for 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 logic circuit of 1*16 Demultiplexer and explain its working principle.
2. Design a 3 bit synchronous counter and explain it.
3. What is magnitude comparator? Design a logic circuit for 4 bit comparator and explain it.

Short Questions:

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

4. Design a half subtractor circuit using only NAND gates.
5. Convert the following decimal numbers into Hexadecimal and Octal numbers:
6. 504
7. 250
8. Design an encoder using universal gates.
9. What do you mean by D-flip-flop?
10. What is sequential logic? What are the important features?
11. Simplify the Boolean function using K-Maps.
12. F = X'yz + X'yz' +Xy'z' +Xy'z
13. Draw a parallel-parallel-out shift register and explain it.
14. Explain the 4 bit ripple counter.
15. Explain the programmable logic array.
16. Write short notes on :
    a. Asynchronous counter
    b. Multiplexers
    c. State reduction table