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

**2071(II)**

Bachelor Level/ First Year/ First Semester/ Science — Full Marks: 80
**Computer Science and Information Technology (CSc. 354)** — Pass Marks: 32
(Real Time System)

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

## Group A

**Attempt any two questions:** **(2 x 12=24)**

1. Describe the rules for basic priority inheritance protocol with example.
2. Define resource reservation protocol. Explain in brief, the different types of issues that a resource reservation protocol must deal with.
3. Define rate-monotonic (RM) and deadline-monotic (DM) algorithms. Describe the DM algorithm with example.

## Group B

**Attempt any Eight Questions:** **(8 x 7=56)**

1. What do you understand by "Tracking" and "Gating" in a Radar system? Explain.
2. What are the meanings of hard real time system, hard timing constraints and temporal quality of service guarantees?
3. Define release time jitter, relative deadline, and hyper period. If the execution times of three periodic tasks are 1, 1, and 3, and their periods are 3,4 and 10, then find out the total number of jobs in the hyper-period, and total utilization of jobs.
4. Describe the significance of laxity type with the help of suitable diagram.
5. Differentiate between dynamic systems and static system in real time systems.
6. Why does the scheduler perform an acceptance test while scheduling sporadic jobs? Explain.
7. Define Deferrable server. State and explain the consumption and replenishment rules of deferrable servers.
8. Describe the meaning of resource conflict, blocking, priority inversion, and deadlock caused by resource contention.

9. Describe the meaning of job shops and flow shops of end to end tasks in a multiprocessor scheduling.
10. Write short notes on any two:
    a. Service discipline in real time communication
    b. Critical section and outermost critical section
    c. Context switches