**POKHARA UNIVERSITY**

Level: Bachelor | Semester: Fall | Year : 2021
Programme: BE | Full Marks: 100
Course: Real Time System | Pass Marks: 45
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

***Attempt all the questions.***

1. a) Explain different types of Programming languages that are used for developing Real-time Systems. 7
   b) Differentiate between Hard and Soft RTS with three examples of each. 8
2. a) How do Formal Specification techniques differ from Informal Specification techniques for specifying requirements of a Real-time System? Explain with examples. 8
   b) What is co-routine? Explain the Preemptive Priority systems. 7
3. a) Explain the Dynamic Priority Scheduling With example. 8
   b) Describe memory locking as an important feature provided by commercial real-time kernels. How does this feature differ from swapping technique used by conventional operating systems? 7
4. a) What do you mean by critical regions? Explain the mailboxes and semaphore. 7
   b) How can response time be analyzed for Fixed Priority systems? Compute the response times of the following three tasks if the tasks are to be scheduled Rate monotonically. 8

| $T_i$ | $e_i$ | $P_i$ |
|---|---|---|
| $T_1$ | 1 | 3 |
| $T_2$ | 1 | 5 |
| $T_3$ | 1 | 10 |

5. a) Define Interrupt latency. Explain the compute response time in a Rate Monotonic analysis. 7



   b) What is Fault Masking? Explain the System Unification and verification. 8
6. a) What are POSIX timers, how can they be created? What are different types of timers? 8
   b) What do you mean by system reliability? Explain the Probe Effect and Patching. 7
7. Write short notes on: (**Any two**) 2×5
   a) POSIX Mutexes and Condition Variables
   b) Parts of Typical Real Time System
   c) Time Relative Buffering