JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-VII Semester (ECE)

COURSE CODE (CREDITS): 19B1WEC731(3)   MAX. MARKS: 25

COURSE NAME: REAL TIME OPERATING SYSTEM

COURSE INSTRUCTORS: Dr. Rajiv Kumar   MAX. TIME: 1 Hour and 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q-1. a) What is main difference between a conventional database and a real-time database? Explain real-time databases with examples in spacecraft control system and process control.
[CO-4], 3

b) Given a temporal data item d =(15, 2500 mSec, 100 mSec) and the values of current time instants are 2550 mSec and 2700 mSec. Is the given data absolutely valid?
[CO-4], 2

Q-2. In what way delay and jitter are related with Quality of Service (QoS) of real-time communication. Explain.
[CO-3], 2.5

b) Consider a single video source transmitting 20 frames per second to a certain receiver. Each frame contains 30 mb of data. The jitter in the network is known to be 2 sec. Compute the amount of buffer space required at the receiver to compensate for the for the jitter.
[CO-3], 2.5

Q-3 a) What are two problems faced by real-time programmer while using Unix for real-time applications?
[CO-2], 2.5

b) Compare the performance of Windows NT and Unix as a real-time operating system.
[CO-2], 2.5

Q-4 a) Make a comparison between Cyclic and Table-Driven scheduling? Also enlist one limitation of each one.
[CO-1], 3

b) Explain the real-time tasks scheduling on the basis of target platforms.   [CO-1], 2

Q-5 a) Explain Rate Monotonic Algorithm (RMA) with reference to priority of scheduling. Give necessary and sufficient conditions to check the schedulability in RMA   [CO-3], 3

b) Check, using both necessary and sufficient conditions, whether the following set of three periodic real-time tasks is schedulable under RMA on a uniprocessor:
$T_1=(e_1=20, p_1=100)$, $T_2=(e_2=30, p_2=150)$, $T_3=(e_3=90, p_3=200)$
[CO-3], 2