

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-3 EXAMINATION-DECEMBER-2023

M.Tech-I Semester (ECE)

COURSE CODE (CREDITS): 21M11EC112 (3)

MAX. MARKS: 35

COURSE NAME: Embedded Systems and Applications

MAX. TIME: 2 Hours

COURSE INSTRUCTOR: Dr. Pardeep Garg

Note: (a) All questions are compulsory. (b) Marks are indicated against each question in square brackets. (c) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems.

Q1. Suppose that a set of tasks in an embedded system must finish in 200 ms. Discuss the functioning of Watchdog Timer which is inbuilt in Embedded system w.r.t the given scenario in the following situations: [CO-3, 5 marks]

- i) The set of tasks finish their execution in the given time interval.
- ii) The set of tasks don't finish their execution in the given time interval.

Q2. Discuss the functioning of Serial bus communication protocols: Inter-Integrated Circuit (I²C) and Serial Peripheral Interface (SPI) in detail. Also, compare these 2 protocols on the basis of common technical performance parameters. [CO-4, 7 marks]

Q3. Write a short note on Wireless Devices used for communication in Embedded Systems. [CO-4, 3 marks]

Q4. In embedded system terminology, a clock based on the interrupts at preset intervals is called as Discuss the answer in detail with its implementation of a software timer. [CO-4, 3 marks]

Q5. In a few situations, polled loop system is preferred over interrupt system, whereas in few other scenarios, interrupt system is preferable compared to polled loop system; justify this statement using some real-time example. Also, compare these on the basis of common technical features. [CO-5, 6 marks]

Q6. Employing some real-time example, differentiate between processes and threads in the context of real time operating system. [CO-5, 5 marks]

Q7. Write short note on following:

- i) Scheduling
- ii) Inter-process Communication

[CO-5, 3+3=6 marks]