JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION-2024

M.Tech-I Semester (ECE)

COURSE CODE (CREDITS): 21M11EC112 (3) **MAX. MARKS: 35**

COURSE NAME: Embedded Systems and Applications

COURSE INSTRUCTOR: Dr. Pardeep Garg **MAX. TIME: 2 Hours**

Note: (a) All questions are compulsory. (b) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems.

Q. No	Question	CO	Marks
Q1	How do the communication protocols, Inter-Integrated Circuit (I²C) and Serial Peripheral Interface (SPI) function? Discuss in detail. Also, differentiate these 2 protocols on the basis of common technical performance parameters.	CO-4	7
Q2	Suppose that a set of tasks in an embedded system must finish in some prescribed time interval. Discuss the functioning of Watchdog Timer which is inbuilt in Embedded system w.r.t the given scenario in the following situations: 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. Also, discuss a real-time example as an application area where this property is employed.	CO-3	5+1=6
Q3	For the purpose of connecting sensors and electronic control units (ECUs) in vehicles in Automotives and industrial systems, which serial bus communication protocol is utilized? Discuss the same in detail.	CO-2	3
Q4	How is a clock which is based on the interrupts at preset intervals in embedded system terminology, termed as? Discuss the answer in detail with its implementation of a software timer.	CO-4	3
Q5	How are tasks, processes, and threads related? Also, compare and contrast processes and threads on the basis of 4-5 common technical points.	CO-5	2+4=6
Q6	*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	4

Q7	Write short note on the following:
	   i) Context Switching
	   ii) Real-time Memory Management
		CO-5	3+3=6