COLLEGE: ST. JOSEPH'S COLLEGE OF ENGINEERING AND TECHNOLOGY, PALAI

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, JUNE 2021

Course Code: CS 404

Course Name: EMBEDDED SYSTEMS

Max. Marks: 70		Duration: 2.15 Hours

PART A

		Answer any two full questions, each carries 10.5 marks.	Marks
1	a)	List out the steps in Embedded System design process. Based on these steps, design a GPS moving map in a car.	(7)
	b)	Consider an online shopping scenario with account, order, shopping cart and payment. Draw the system's class diagram with attributes and show the relationships among the classes.	(3.5)
2	a)	Draw the use case diagram for the following Embedded System processes. i. Smart cooking process in an oven ii. Working of Washing machine	(7)
	b)	Draw a data flow diagram for identifying the nature of roots of quadratic equation.	(3.5)
3	a)	Draw the finite state diagram of a traffic control system and timer which controls the timing of traffic control system in a junction. The system allows to pass the vehicle for 60 seconds. After fifty second it turns orange. After 10 second it moves to green. Draw the state diagram of the system. If any error occurs it comes to reset state.	(7)
	b)	Compare between microprocessor and microcontroller.	(3.5)

PART B

Answer any two full questions, each carries 10.5 marks.

4	a)	Outline the steps to be followed to convert a firmware program written in assembly language to corresponding processor specific machine code?	(7)
	b)	Suggest a firmware design approach for electronic video game (one which continue till we say to stop). Write the pseudo code.	(3.5)
5	a)	What are the methods to be adopted to embed firmware without removing the chip from the board?	(7)
	b)	List out the components of embedded system development environment. Draw a neat diagram to show the integrated working of these components.	(3.5)
6	a)	The result of cross compilation is a list of files. Mention the name of the files. Show the format and summarize the fields present in each file.	(7)

	b)	There is an efficient fax machine developed in 80's. How can you identify the technology behind the system?	(3.5)
PART C			
Answer any two full questions, each carries 14 marks.			
7	a)	Find out the average waiting time and average turnaround time for the following processes when applying a. FCFS b. LCFS c. SJF d. Priority scheduling e. Round robin (time slice 3ms) Assume that all processes are present at the beginning. Process | Burst | Priority P1 | 8 | 4 P2 | 6 | 1 P3 | 1 | 2 P4 | 9 | 2 P5 | 3 | 3	(8)
	b)	Mr. Ben wants to cook an item using oven. He set cooking time for 10 minutes keep the food item inside and switch on the Oven. After 5 minutes he understood that the time set is not enough for cooking. He wants to increase the time of cooking. Demonstrate how the increase of timing is handled by the RTOS environment using two level ISR handling method?	(6)
8	a)	A home automation system has to be developed. List out and describe the steps to be followed for the systematic development of this embedded product.	(8)
	b)	Illustrate how the I2C bus is used in automatic car braking system? Show the interfacing of I2C bus with micro controller using a neat diagram.	(6)
9	a)	Summarize the recent development trends in processor and embedded system design languages?	(8)
	b)	An automatic biscuit manufacturing company uses an embedded system to control the production and packing session of their products. Identify the criteria to choose the RTOS for their controlling machine?	(6)
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