APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER

Q. P. Code : PE0821252A-I   (Pages: 2)

SECOND SEMESTER M.TECH. DEGREE EXAMINATION JULY 2021

Branch: Electrical and Electronics Engineering   **Specialization: Power Electronics**

08EE6252 (A) EMBEDDED CONTROLLERS IN REAL TIME SYSTEMS

(Common to PE)

Time: 2 hour 15 minutes   Max. Marks: 60

Answer all six questions.

Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q. No.	Module 1	Marks
1.a	An industrial application demands the measurement of temperature using LM35. Suggest a suitable interfacing method for temperature measurement using 8051.	3

Answer b or c

b	Analyze the architecture of 8051 microcontroller, with a neat diagram. List down the applications of microcontrollers.	6
c	Classify the instructions in 8051 instruction set and discuss them in brief.	6

Q. No.	Module 2	Marks
2.a	List down the differences between Round-Robin Scheduling and Rate-Monotonic Scheduling.	3

Answer b or c

b	Categorize the various Kernel Design strategies of a Real Time Operating system.	6
c	Discuss the concept of Distributed Real Time Architecture.	6

Q. No.	Module 3	Marks
3.a	Differentiate between linear buffering and ring buffering.	3

Answer b or c

b   Define deadlock. List down few differences between deadlock and starvation.   **6**

c   Give the definitions of Response Time and Waiting Time. A First Come First   **6**
Serve CPU scheduling algorithm is used for the below 3 processes:

Process	Arrival Time	Burst Time
P1	0 ms	8 ms
P2	1 ms	7 ms
P3	2 ms	10 ms

Calculate the Response Time and Waiting Time of each process.

Q. No.	Module 4	Marks

4.a   Define the concept of RISC.   **3**

Answer b or c

b   With a neat diagram, explain the architecture of PIC 16F877 microcontroller.   **6**

c   Explain the interfacing of a 16 x 2 LCD display with PIC 16F877   **6**
microcontroller.

Q. No.	Module 5	Marks

5.a   Explain the different stages of pipelining in DSP.   **4**

Answer b or c

b   Draw and explain the architecture of DSP.   **8**

c   Elaborate on the address generation unit of DSP.   **8**

Q. No.	Module 6	Marks

6.a   Explain various addressing modes of TMS 320F2407.   **4**

Answer b or c

b   Implement stepper motor control using TMS 320F2407 with a diagram.   **8**

c   Brief about the software and hardware development tools for DSP   **8**
microcontroller.