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10EC842

Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Real Time Operating Systems

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. With the help of pseudocode and state diagram, explain basic real time service using polling technique. (08 Marks)
 b. Describe the time line diagram of real time systems. Represent the changes in it if hardware acceleration is used. (08 Marks)
 c. Write any four key features of RTOS. (04 Marks)

- 2 a. Describe six real time service utility functions with relevant graph. (12 Marks)
 b. With necessary pseudocodes, explain thread safe reentrant codes. (08 Marks)

- 3 a. Derive an expression for utility of RMLUB by considering two service system. (10 Marks)
 b. Consider three services S1, S2 and S3 with release time 2, 5, and 7 respectively, having execution time 1, 1 and 2 units sequentially. Draw the timing diagram for RM policy and calculate individual service utility. For same specifications, draw timing diagram for earliest deadline first policy. (Assume $\text{prio}(S1) > \text{prio}(S2) > \text{prio}(S3)$ wherever necessary). (10 Marks)

- 4 a. Briefly describe the following :
 i) Pipelining technique
 ii) Physical hierarchy in memory
 iii) Shared memory. (10 Marks)
 b. Consider a byte of data given by $(11000100)_2$. Determine the encoded bit stream using Hamming code. In the computed syndrome, consider a single bit error at position d03. Detect and correct the error. (10 Marks)

PART – B

- 5 a. With necessary considerations, explain unbounded priority inversion. Suggest solutions to avoid it. (10 Marks)
 b. Consider four service systems having following details.

Services	Execution time	Release time
S1	1	2
S2	1	5
S3	1	7
S4	2	13

- Draw the timing of diagram for RM and DM policies and comment on result. (Assume $\text{prio}(s1) > \text{prio}(s2) > \text{prio}(s3) > \text{prio}(s4)$). (06 Marks)
- c. Briefly describe deadlock in shared resources. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



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- 6 a. Write short notes on :
- i) Single step debugging types (10 Marks)
 - ii) Exceptions and asserts. (06 Marks)
- b. Describe three firmware components. (04 Marks)
- c. Explain reentrant application libraries.
- 7 a. Explain drill down tuning. (08 Marks)
- b. Explain the methods for building performance monitoring capability into a software. (06 Marks)
- c. List the basic methods for optimizing code segments. (06 Marks)
- 8 a. Compare reliability and availability. Discuss reliability with an example. (10 Marks)
- b. List out the steps involved in programming a memory location of PIC low-end programming. Write waveforms for programming and fast verification. (10 Marks)

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