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Total Number of Pages : 01

B.Tech.
PECS5408

**8th Semester Regular / Back Examination 2017-18
EMBEDDED SYSTEM DEVELOPMENT**

BRANCH : CSE, IT, ITE

Time : 3 Hours

Max Marks : 70

Q.CODE : C467

Answer Question No.1 which is compulsory and any FIVE from the rest.

The figures in the right hand margin indicate marks.

Answer all parts of a question at a place.

- Q1. Answer the following questions: *Short answer type* :** **(2 x 10)**
- a) What are the typical characteristics of an embedded system?
 - b) Define embedded microcontroller.
 - c) What does UART contain?
 - d) Define RTOS.
 - e) What are the applications of an embedded system?
 - f) Define SoC with an example.
 - g) Draw the data frame format of CAN.
 - h) What is rate-monotonic scheduling?
 - i) Differentiate coarse and fine granularity.
 - j) Define hardware/software trade-off.
- Q2.** **(5)**
- a) Explain state transition diagram of RTOS.
 - b) List the characteristics of hybrid scheduler. **(5)**
- Q3.** **(5)**
- a) Differentiate soft and hard RTOS.
 - b) Consider the following three periodic real-time tasks to be scheduled using EDF on a uniprocessor: $T_1 = (e_1 = 10, p_1 = 20)$, $T_2 = (e_2 = 5, p_2 = 50)$ and $T_3 = (e_3 = 10, p_3 = 35)$. Determine whether the task set is schedulable. Is EDF really a dynamic priority scheduling algorithm? Justify your answer. **(5)**
- Q4.** **(5)**
- a) Explain the schedulability test for RMA. Specify the necessary and sufficient condition.
 - b) With a neat diagram explain the microkernel-based systems. **(5)**
- Q5.** **(5)**
- a) Differentiate between SRAM and DRAM.
 - b) Describe the architecture of a typical microcontroller with a neat diagram. **(5)**
- Q6.** **(5)**
- a) Explain general-purpose processor basic architecture with a neat sketch diagram.
 - b) What is an application-specific integrated circuit? Explain its design and implementation. **(5)**
- Q7.** **(10)**
- What do you mean by MISRA C? List out the rules of MISRA C. What are the requirement of partitioning hardware and software in developing embedded application?
- Q8. Write short answer on any TWO :** **(5 x 2)**
- a) Flash Memory
 - b) POSIX-RT
 - c) Embedded System Development Life Cycle
 - d) Design for Testability Techniques