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Total Number of Pages : 01

B.Tech.  
PECS5408

8<sup>th</sup> 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.**
- a) Explain state transition diagram of RTOS. (5)
  - b) List the characteristics of hybrid scheduler. (5)
- Q3.**
- a) Differentiate soft and hard RTOS. (5)
  - 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.**
- a) Explain the schedulability test for RMA. Specify the necessary and sufficient condition. (5)
  - b) With a neat diagram explain the microkernel-based systems. (5)
- Q5.**
- a) Differentiate between SRAM and DRAM. (5)
  - b) Describe the architecture of a typical microcontroller with a neat diagram. (5)
- Q6.**
- a) Explain general-purpose processor basic architecture with a neat sketch diagram. (5)
  - b) What is an application-specific integrated circuit? Explain its design and implementation. (5)
- Q7.** 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? (10)
- 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