Registration no: ☐☐☐☐☐☐☐☐☐☐

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B.Tech
PEEC5405

8th Semester Regular / Back Examination 2016-17
EMBEDDED SYSTEMS
BRANCH(S): AEIE, EIE, IEE
Time: 3 Hours
Max Marks: 70
Q.CODE: Z206
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions:**   (2 x 10)
   a) What are different classification of Embedded System based on their complexity of implementation?
   b) What is the basic difference between Von-Neumann and Harvard Architecture?
   c) Write any four operational quality attributes of Embedded System.
   d) What is the use of Use Case diagram in UML?
   e) What is NVRAM?
   f) What is the difference between process and thread?
   g) What is cross compiler? How it is different from normal compilers?
   h) What are the conditions favoring deadlock in multiprocessing environment?
   i) What is priority inversion problem?
   j) What is user acceptance testing?

Q2 **a)** What is EDLC and why it is Required?   **(2)**

   b) What are the different Phases of EDLC? Discuss them in detail with suitable example. Explain the merits and drawbacks of prototyping model for embedded system development.   **(8)**

Q3 **a)** What is the difference between General Purpose Processor(GPP) and Application Specific Instruction Set Processor(ASIP)? Discuss with Example. Why GPPs are preferred over ASSP?   **(5)**

   b) What are the different choices available for data and program memory? Compare their access time vrs cost and suitability for embedded applications.   **(5)**

Q4 **a)** What is the difference between hard and soft real time systems? **(5)**
Three Processes with IDs P1, P2, P3 with estimated completion tyme of 10, 5, 7 ms and priorities 1,3 and 2 respectively (0 being highest priority) enters the ready queue together. A new process P4 with estimated completion time 6ms and priority 0 enters the ready queue after 5ms of start of execution of P1. Calculate turnaround time and waiting time of each process as well as average waiting time. Assume all the process contains onlu CPT job, no I/O jobs are involved.

b) What is critical section? Discuss how mutual exclusion can be implemented using Mutex Semaphores. **(5)**

Q5 **a)** What do you mean by hardware software co design? What is the typical embedded product design and development approach? **(5)**

b) What is the role of a modeling language in embedded design? Design and discuss FSM model for a coin operated tea/coffee vending machine. **(5)**

Q6 **a)** What do you mean by supper loop based approach? What are the advantages of assembly language based development of embedded system firmware? Which development tools are required if the development Is carried out using Higher Level Language? **(5)**

b) What is the role of VHDL in hardware design? What are the building blocks of layouts? Explain them in details. **(5)**

Q7 What is the role of reset circuit in Embedded System? What are the different types of reset circuits available? Explain them in detail. Discuss how the watch dog timer operates to sense, when the program execution hangs up and how it recovers the system? **(10)**

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Q8 **Write short answer on any TWO:** **(5 x 2)**
a) Unified Modeling Language

b) RISC Vs CISC Architecture

c) Preemptive Vs Non-Preemduling Scheduling

d) OrCAD as EDA Tool