

Total No. of Questions : 12]

SEAT No. :

**P855**

**[4659]-233**

[Total No. of Pages : 3

**B.E. (Computer)**

**c - EMBEDDED SYSTEMS**

**(2008 Course) (Elective - II) (Semester - I)**

*Time : 3Hours]*

*[Max. Marks :100*

*Instructions to the candidates:*

- 1) *In section I, attempt: Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.  
In Section II, attempt: Q.7 or Q.8, Q.9 or Q.10. Q.11 or Q.12.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicates full marks.*
- 5) *Assume suitable data, if necessary.*

**SECTION-I**

- Q1)** a) What are different categories of Embedded systems depending on the area of applications? Give examples. [6]
- b) Explain how digital signal processor and media processor are different than a normal processor. [6]
- c) Explain different steps in Embedded system design process. [6]

OR

- Q2)** a) Which characteristics of an Embedded system make it different than a general purpose system? [6]
- b) Differentiate between RISC and CISC architecture of the processors used in Embedded systems. [6]
- c) How ASIC and ASSP are different than other general purpose processors? What are the advantages of using them in the system? [6]
- Q3)** a) Discuss the interrupt and exception structure in ARM7 architecture. [6]
- b) Discuss different structural units in a processor. Mention few advanced units and their effect on performance of a processor. [6]
- c) What is the importance of a watchdog timer in an Embedded system?[4]

OR

**P.T.O.**

- Q4)** a) A Network Gateway is to be designed. Select the appropriate processor based on: [6]
- i) instruction cycle time
  - ii) Bus width
  - iii) MIPS
  - iv) On chip cache
  - v) On chip RAM | ROM
- b) Discuss various ways of power management in an Embedded system to reduce power consumption. [5]
- c) Describe architectural features of ARM7 core in brief. [5]

- Q5)** a) Discuss CAN protocol w.r.t. following points: [10]
- i) Standard data frame format
  - ii) Arbitration mechanism
  - iii) Different types of frames
  - iv) Bit stuffing mechanism
- b) Describe various optical devices commonly used in Embedded systems. Also list their applications. [6]

OR

- Q6)** a) Which topology is used by devices to communicate through USB protocol? Discuss the data transfer mechanism in details. [8]
- b) Describe I<sup>2</sup>C protocol w.r.t. following points: [4]
- i) Data transfer speed
  - ii) Arbitration
- c) Discuss the importance of data converters in Embedded systems such as process control plant. [4]

### SECTION-II

- Q7)** a) Explain the process of converting a C program into a file for ROM image. [6]
- b) Explain the usage of stacks and queues in Embedded system programming. [8]
- c) How cross compilers are different than compilers? [4]

OR

- Q8)** a) How C++ is useful in Embedded system programming? Also mention its disadvantages [6]  
b) What is In- Circuit - Emulator? Discuss its working in details. [6]  
c) Explain software development cycle for Embedded system with the help of neat diagram. [6]

- Q9)** a) Differentiate between Embedded OS, RTOS and Desktop OS. [6]  
b) Name two advanced scheduling algorithms. [2]  
c) Discuss different ways of interrupt handling in RTOS environment. What care is taken while writing ISRS? [8]

OR

- Q10)**a) Discuss the following scheduling models of RTOS considering worst case latency, advantages and disadvantages. [9]  
i) Co-operative Round Robin  
ii) Co-operative Ordered list  
iii) Co-operative Time slicing  
b) Name and explain in brief any three IPC mechanisms used for process synchronization. [3]  
c) Compare assembly language programming and high level language programming. [4]
- Q11)**a) Describe hardware and software architecture of Navigation system in details. [6]  
b) Discuss different features of micro C / OS-II. [4]  
c) Discuss features and applications of symbian OS. [6]

OR

- Q12)**a) Give details of hardware and software components of Handheld computer system. [6]  
b) Explain the working of Automatic cruise control system. What are hardware and software requirements of it? [6]  
c) Discuss various applications where Vx works is used. Also list its features. [4]

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