

Total No. of Questions :12]

SEAT No. :

**P3436**

**[4959]-211**

[Total No. of Pages :3

**B.E. (Computer Engineering)**

**c: EMBEDDED SYSTEMS**

**(2008 Course) (Elective - II) (Semester - I) (410445)**

*Time : 3 Hours]*

*[Max. Marks :100*

*Instructions to the candidates:*

- 1) *Answer Question No. 1 or 2, 3 or 4, and 5 or 6 from section I and Q.No. 7 or 8, 9 or 10 and 11 or 12 from section II.*
- 2) *Answers to the two sections must be written in separate answer books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

**SECTION-I**

- Q1)** a) What are the different categories of Embedded Systems depending on the area of applications? Give Examples. [8]
- b) Discuss various application areas of embedded system. [4]
- c) Explain how embedded processor and Application Specific system Processors are different than a general processor? [6]

OR

- Q2)** a) Differentiate between RISC and CISC architecture of the processors used in embedded systems. [6]
- b) What challenges are faced while designing an embedded system. [6]
- c) Draw layered architecture of Embedded system. Discuss various components in the Embedded System. [6]
- Q3)** a) Draw the architecture of ARM7 core. How ARM9 family is different than ARM7? [8]
- b) Discuss different structural units in a processor in an embedded system. Mention few advanced units. [8]

OR

**P.T.O.**

- Q4)** a) Which parameters are dependent on supply voltage and clock frequency in a system? [4]
- b) Describe different operating modes of ARM7 processor. [6]
- c) It is required to design a real time robotic control system. For this application, 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
- Q5)** a) Compare RS232 and RS485 standards. [4]
- b) Discuss 12C protocol w.r.t. following points [8]
- i) Data transfer speed
  - ii) Arbitration
  - iii) Data frame format
- c) Which optical devices are commonly used in embedded systems? [4]

OR

- Q6)** a) Discuss different field in the data frame of CAN bus protocol. What are the applications of CAN? [8]
- b) Discuss the topology used by devices to communicate through USB protocol. Mention different types of data transfer. [8]

### **SECTION-II**

- Q7)** a) What are the advantages and disadvantages of programming in C++ for Embedded system? [8]
- b) What is In-circuit-Emulator? Give details. [6]
- c) How cross compilers are different than compilers? [4]

OR

- Q8)** a) Explain the use of data structures namely stack and tree in brief. [6]  
b) How java is useful in embedded system programming? Also mention its disadvantages. [6]  
c) Explain the process of converting a C program into a file for ROM image. [6]

- Q9)** a) Explain the kernel services in an OS. [8]  
b) How RTOS performs the schedule management of multiple tasks. [8]

OR

- Q10)** a) Discuss different ways in which interrupts are handled in RTOS environment. [6]  
b) What are virtual device drivers? Explain. [6]  
c) Differentiate between RTOS and embedded OS. [4]

- Q11)** a) Explain digital camera with respect to hardware and software components. [8]  
b) Differentiate between soft real time operating system and hard real time operating system. [4]  
c) Identify the requirements of s/w mobile phone and show it with the help of class diagram. [4]

OR

- Q12)** a) Discuss different features of  $\mu$ COS-II. [4]  
b) Differentiate between Embedded OS and Desktop OS. [4]  
c) Write short note on any two [8]  
i) Embedded Linux.  
ii) VxWorks.  
iii) Special OS features for automotive systems.

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