Total No. of Questions :12]

SEAT No. :

P3436

[Total No. of Pages :3

[4959]-211

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) Expalin 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 µCOS-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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