Total No. of Questions : 12]

SEAT No. :

P1999

[Total No. of Pages : 3

[5254] - 170
B.E. (Computer Engineering)
EMBEDDED SYSTEMS
(2008 Pattern) (Elective - II)

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 diagram must be drawn whenever 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) Draw layered architecture of Embedded system. Discuss various components in the Embedded System. **[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) Explain how embedded processor and Media Processor are different than a general processor? **[6]**

Q3) a) Discuss various actions taken to reduce the power consumption in an embedded system. **[8]**

b) Discuss different structural units in a processor in an embedded system. Mention few advanced units. **[8]**

OR

P.T.O.

Q4) a) Discuss various read only memories used in an embedded system? **[4]**

b) Discuss 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) Differentiate between parallel and serial ports in a system. **[4]**

b) Discuss 12C protocol w.r.t. following points **[8]**

i) Data transfer speed

ii) Arbitration

iii) Data frame format

c) Discuss optical devices commonly used in embedded systems along with applications? **[4]**

OR

Q6) a) Discuss different fields 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 the use of an emulator in embedded system design? Explain with the help of diagram. **[10]**

OR

Q8) a) With the help of neat diagram, explain software development cycle for embedded system. **[8]**

b) Explain the usage of stacks and queues in embedded system programming. **[10]**

Q9) a) What are the subsystems of an I/O system? Explain. **[8]**

b) How RTOS performs the schedule management of multiple tasks. **[8]**

OR

Q10)a) Comparc the following scheduling models of RTOS, based on worst case latency : **[6]**

i) Cooperative Round Robin

ii) Cooperative ordered list

iii) Cooperative Time slicing (rate monotonic)

b) What are virtual device drivers? Explain. **[6]**

c) Compare assembly language programming and high level language programming. **[4]**

Q11)a) Write short note on any two : **[8]**

i) Embedded Linux

ii) VxWorks

iii) Special OS features for automotive systems

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 μ COS - II. **[4]**

b) Differentiate between RTOS and Desktop OS based on the following points : **[4]**

i) Interrupt handling

ii) Task scheduling

c) Explain digital camera with respect to hardware and software components. **[8]**

▽▽▽▽