Total No. of Questions : 12] SEAT No. :

P4276 [Total No. of Pages : 3

[4759] - 191A
B.E. (Information Technology)
EMBEDDED SYSTEMS
(2008 Pattern) (Elective - II)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer to the two sections should be written in separate answer books.***
2) ***In section I attempt : Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6. In section II attempt: Q.No. 7 or Q. No. 8, Q. No. 9 or Q.No. 10, Q.No. 11 or Q.No. 12.***
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 advantages of using ASIC & SOC in embedded systems? Explain. **[8]**

b) Classify different embedded systems. List commonly used microcontrollers in each category. **[8]**

OR

Q2) a) What are the embedded systems? How they are different than general purpose systems? **[6]**

b) What are the different components of an embedded system? **[6]**

c) Name the area of applications for the following processors : **[4]**

i) Digital signal processor.

ii) Media processor.

Q3) a) What are the different applications of timers in Embedded systems? How watchdog timer is different? **[6]**

b) Explain the techniques to optimize the use of power in an embedded system? **[6]**

c) What are the types of memory that can be used in an embedded system? Justify their used. **[6]**

OR

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Q4) a) How a designer selects EPROM, RAM and peripherals required for an adaptive cruise control system? Explain. **[8]**

b) Explain the process of converting a C program into a file for ROM image. **[4]**

c) Explain in brief the use of following in an embedded system : **[6]**

i) Real time clock

ii) UART

Q5) a) List and describe five types of device driver functions. **[8]**

b) Name features of RS-232C. Explain the RS-232C signals used for communication. **[8]**

OR

Q6) a) Explain different features of CAN protocol. **[8]**

b) How does host recognize the device insertion in USB protocol? Explain in detail. **[8]**

SECTION - II

Q7) a) Explain the advantages of programming embedded systems using high-level languages. **[8]**

b) Queue data structure of C language is used for networking applications. Explain. **[6]**

c) When do you use assembly language for embedded system programming? **[4]**

OR

Q8) a) Compare Java and C++ programming and their suitability for embedded systems. **[6]**

b) What is cross compiler? How it is different than generic compiler? Give example for cross compiler. **[6]**

c) What is in-circuit emulator? Give details of its use in embedded system development. **[6]**

Q9) a) When do you require RTOS? **[6]**

b) With the help of neat diagram, explain cooperative round robin scheduling model for RTOS. What is interrupt latency time for this scheduling model. **[10]**

OR

Q10) a) With the help of neat diagram, explain preemptive scheduling for RTOS. **[8]**

b) How can you manage without RTOS? **[8]**

Q11) a) Differentiate MicroC/OS-II and Vx Works based on features and their area of application. **[6]**

b) With the help of neat system block diagram, explain the system requirements and tasks for an adaptive cruise control system in a car. **[10]**

OR

Q12) a) How tasks are managed in MicroC/OS-II? Explain in detail. **[8]**

b) With help of neat diagram, explain synchronization of tasks and IPCs for TCP/IP network application. **[8]**