Total No. of Questions :12]

SEAT No. :

P3414

[Total No. of Pages :3

[4959]-188

B.E. (Information Technology)

a: EMBEDDED SYSTEMS

(2008 Course) (Semester - I) (Elective - II) (414444)

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

Instructions to the candidates:

1) ***Answers 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 is an embedded system? What are its characteristics? **[8]**

b) What are the criteria for selecting microprocessors or microcontrollers for an application? **[8]**

OR

Q2) a) List commonly used microcontrollers in small, medium and large scale embedded systems. **[6]**

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

c) Differentiate between CISC and RISC. **[4]**

Q3) a) Describe the use of timers/counters and watchdog timers in an embedded system. **[6]**

b) What are the techniques of power & energy management used in an embedded system? **[6]**

c) What are the types of memory that can be integrated in a processor? **[6]**

OR

P.T.O.

Q4) a) How a designer selects EPROM, RAM and peripherals required for a robot arm control application? Explain. **[8]**

b) What is the importance of clocking unit in embedded systems? How does it affect performance of an embedded system? **[4]**

c) Explain the typical memory map for a small scale embedded application. **[6]**

Q5) a) What is the difference between serial & parallel I/O? Mention different standards used for both. **[8]**

b) Describe SPI protocol in brief and the applications where it is preferred. **[8]**

OR

Q6) a) Explain data transfer mechanism in CAN protocol. Also elaborate on arbitration method used in CAN. **[8]**

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

SECTION-II

Q7) a) What are the different phases of software development cycle for a typical embedded system? **[8]**

b) How cross compilers are different than compilers? Give two specific instances where one has to use cross compiler. **[6]**

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

OR

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

b) What are the advantages of assembly language programming when used for the development of an embedded system? Name two embedded system applications where assembly language programming is preferred. **[6]**

c) With an example explain how stacks and queues are used to implement application functionality in embedded system software. **[6]**

Q9) a) What are the different characteristics of real time operating system? Give two example of RTOS. **[6]**

b) With the help of neat diagram, explain cyclic 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) Define and explain interrupt latency period. What is its significance in RTOS? **[4]**

c) What are pipes? Give details. **[4]**

Q11)a) Differentiate Micro C/OS-II and VxWorks 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 chocolate vending machine. **[10]**

OR

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

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

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