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

P765 **[Total No. of Pages : 3**

[4659] - 110
B.E.(Electronics Engineering) (Semester - I)
EMBEDDED SYSTEM
(2008 Pattern)

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

Instructions to the candidates:

1) ***Answer any 3 questions from each section.***
2) ***Answer to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***
5) ***Neat diagrams must be drawn wherever necessary.***
6) ***Use of non programmable electronic pocket calculators is allowed.***

SECTION - I

Q1) a) Define embedded systems. With an example, explain the design metrics challenges in developing embedded system **[8]**

b) With the help of protocol stack and state transition diagram describe the communication in Bluetooth protocol. **[8]**

OR

Q2) a) Explain the role of Integrated Development Environment (IDE) for embedded application design. **[8]**

b) What is time to market? Draw and explain simplified revenue model and also calculate losses if product is delayed by 4 and 8 weeks, assuming product life to be 52 weeks. **[8]**

Q3) a) Explain the software architectures used in Embedded Systems. **[10]**

b) List and explain specifications of embedded processor. Compare Harvard and Von-Neumann processor architectures. **[8]**

OR

Q4) a) What factors need to be considered while selecting a memory? Explain interfacing a memory with a processor with suitable example. **[10]**

b) What is a role of interrupt in Embedded System? Explain how timings are controlled using interrupts. **[8]**

P.T.O.

Q5) a) List and explain different operating modes in ARM7 processor. **[8]**

b) List the features of LPC 2148. Explain the LPC 2148 registers used configuring ADC. **[8]**

OR

Q6) a) What do you understand by a programming model? Explain the difference between ISP and IAP. **[8]**

b) Draw and explain the block diagram of LPC 2148. **[8]**

SECTION - II

Q7) a) Explain on chip ADC/DAC of LPC2148. Also write a program for ADC interfacing to display analog input on LCD. **[8]**

b) List the on chip communication protocols in LPC2148. Write and explain the program to transmit a single character using UART of LPC2148. **[8]**

OR

Q8) a) Explain the tool chain for programming using Embedded C. **[8]**

b) Write and explain the code for interfacing of 4×4 matrix keyboard with LPC 2148. Display the key pressed on LCD. **[8]**

Q9) a) Enlist the μcos - II features. Draw and Explain the μcos - II Architecture in detail. **[8]**

b) What do you understand by the term "clock tick" in RTOS? Explain the time management functions in μcos - II **[8]**

OR

Q10)a) Compare the traditional OS with RTOS and explain the task states and enlist the function for transition of state in the μcos - II. **[8]**

b) Define the context switching. What are the steps involved in μcos - II context switching? Why it puts additional burden on OS? **[8]**

Q11)a) Explain digital camera with suitable block diagram and state its hardware and software requirements. **[10]**

b) Explain priority inversion problem in μcos - II RTOS with an example and discuss the solution for same. **[8]**

OR

Q12)a) Explain interrupt management in μcos - II with timing diagram. **[8]**

b) Explain with neat diagram of adaptive cruise control of vehicle with its hardware and software requirements. **[10]**