

Total No. of Questions : 12]

SEAT No. :

**P3687****[4759]-73**

[Total No. of Pages : 3

**B.E. (Electrical)****EMBEDDED SYSTEM****(2008 Course) (Semester-I) (Elective-II) (403144)***Time : 3 Hours]**[Max. Marks : 100**Instructions to the candidates:*

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of logarithmic tables, electronic pocket calculator and steam tables is allowed.*
- 4) *Assume suitable data, if necessary.*

**SECTION-I**

- Q1)** a) What is an Embedded System and explain the different categories of embedded system? Give example of each category. [8]
- b) Differentiate between General purpose operating system and Embedded systems. Explain the design process in embedded system with waterfall model. [8]

OR

- Q2)** a) Explain RISC and CISC processors with examples and explain the characteristics and features of ARM7 processor. [8]
- b) What is digital signal processor? Explain the architecture of any DSP processor with block diagram. [8]

- Q3)** a) Explain the various types of ADC. Also describe the sample and hold circuit with diagram. [9]
- b) Write a note on any motion sensor along with application. [9]

OR

- Q4)** a) With the help of a diagram explain the interfacing of  $4 \times 4$  matrix keypad to microcontroller. [6]
- b) Describe a strain gauge and its interfacing with micro controller through ADC. [6]
- c) Explain working of Temperature sensor with diagram. [6]

***P.T.O.***

- Q5)** a) What are solenoids and relays? Explain microprocessor interfacing to Solenoids-Relay with diagram. [6]
- b) What is LED ripple and how is the LED ripple prevented. [6]
- c) What is DACs and specialized DACs? [4]

OR

- Q6)** a) What are the different types of stepper motors? Explain bipolar versus unipolar operation of stepper motors. [6]
- b) Explain stepper motor drive ICs (L62D1 & LM18200). [4]
- c) Explain BLDC motor and how it can be driven. [6]

### SECTION-II

- Q7)** a) Explain Inter-processor communication and synchronization of process, tasks and threads. [8]
- b) What is interrupt latency? Interrupt recovery time? [6]
- c) What is device driver and explain device drivers for embedded devices. [4]

OR

- Q8)** a) Explain in detail following scheduling algorithms [10]
- i) First in first out.
  - ii) Round robin.
  - iii) Round robin with priority.
  - iv) Shortest job first.
  - v) Non-preemptive multitasking.
  - vi) Preemptive multitasking.
- b) Explain the concept of semaphores with example. [4]
- c) What is difference between mailbox and message queues? What is application of each? [4]

- Q9)** a) What is a kernel? Explain architecture of kernel. [8]  
b) Explain ISR, pipes and events. [8]

OR

- Q10)** a) Explain the task scheduler and its function. [6]  
b) What are differences between General purpose operating systems and RTOS? [6]  
c) Explain the features of Vxworks. [4]

- Q11)** a) Give a case study of an embedded system for a smart card. [10]  
b) What are the special features needed for embedded software in a smart card? [6]

OR

- Q12)** a) Explain Digital camera with functional block diagram. [10]  
b) Design a control system for a prototype aircraft attitude control. [6]

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