

**PEC-2 / ET704M-2 - Embedded Systems**

P. Pages : 2

Time : Three Hours



**GUG/W/23/14251**

Max. Marks : 80

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- Notes :
1. All questions carry marks as indicated.
  2. Assume suitable data wherever necessary.
  3. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain the different categories of embedded systems with suitable example. **8**  
b) Discuss in details about recent trends in embedded systems. **8**

**OR**

2. a) Explain the hardware architecture of an embedded system. **8**  
b) Draw and explain memory map of LPC 2138. **8**
3. a) Describes the circuit for interfacing the system buses between the processor, memory devices and I/O devices with neat diagram. **8**  
b) Draw and explain the block diagram of structural units at a processor in the embedded system. **8**

**OR**

4. a) Explain various stack structure that are created during execution of embedded software. **8**  
b) Draw and explain the segment types and pages in an exemplary program and an exemplary use of its registers. **8**
5. a) Explain in details about advantages of software programming in assembly and high level language. **8**  
b) Explain in detail about use of data type and data structures in software programming. **8**

**OR**

6. a) Explain briefly about various program elements. **8**  
i) Macro function  
ii) Main function  
iii) Reentrant function  
iv) Recursive function  
b) Draw and explain programming model for multiple function calls in 'main ( )' function. **8**
7. a) What is Kernel. State the various kernel objects and explain any two objects in details. **8**

- b) What is task scheduling. Explain any two task scheduling algorithms. **8**

**OR**

- 8.** a) Explain **8**  
i) Mutex ii) Mailboxes

- b) Explain priority ceiling protocol (PCP) with their features. **8**

- 9.** a) Explain **8**  
i) Semaphore  
ii) Sockets  
iii) Queues  
iv) Pipes

- b) Explain case study of an embedded system for smart card. **8**

**OR**

- 10.** a) Explain case study of an embedded system for an adaptive cruise control system in a car. **8**

- b) Explain shared data problem and its solutions. **8**

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