

B.E. Electrical (Electronics & Power) Engineering (Model Curriculum) Semester-VII  
**OEC-3-1 / FE103-1 - Embedded Systems**

P. Pages : 2

Time : Three Hours



**GUG/W/24/14243**

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) What is embedded system. Explain the different program layers in the embedded software. 8
- b) Explain the different categories of embedded systems with suitable example. 8

**OR**

2. a) Explain the hardware architecture of an embedded system. 8
- b) Draw and explain memory map of LPC2138. 8
3. a) Define array and queue. Explain with neat diagram array and queue at a memory blocks. 8
- b) With neat block diagram explain how memory interface with processor and I/O devices. 8

**OR**

4. a) Explain three stage pipeline and superscalar processing and branch and data dependency penalties. 8
- b) What is memory mapping what are the types of memory map architecture. Explain any one memory map architecture. 8
5. a) Explain – 8
- i) A queue between sockets.
- ii) The queue of the packets on a network.
- b) Draw and explain a programming model in which there are three software timers in an active list. 8

**OR**

6. a) Draw and explain a programming model for the multiple function pointers that are queued by the interrupt service routine. 8
- b) What is object oriented programming. What are their types also state advantages and disadvantages of each. 8

7. a) What is priority inheritance protocol. Explain how priority changes under priority inheritance protocol. 8
- b) What is semaphores. Explain following – 8
- i) Resource synchronization
  - ii) Task synchronization
  - iii) Display semaphores
  - iv) Counting semaphores

**OR**

8. a) What is RMA. Explain RMA with example also state issues associated with RMA. State advantages and disadvantages of RMA. 8
- b) Explain the operation of priority ceiling protocol in sharing critical resources among real time tasks. 8
9. a) Draw and explain an embedded system for an adaptive cruise control system in a car. 8
- b) What is remote procedure call. Explain with neat diagram. 8

**OR**

10. a) What is Kernel. Explain structure of Kernel. 8
- b) What is shared data problem. Explain the solution of shared data problem with example. 8

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