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**Question Paper Code : 41008**

**B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018**

**Sixth Semester.**

**Electrical and Electronics Engineering**

**EE 6602 – EMBEDDED SYSTEMS**

**(Common to : Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)  
(Regulations 2013)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**PART – A**

**(10×2=20 Marks)**

1. What are the typical characteristics of an embedded system ?
2. What are the functional requirements of embedded system ?
3. Define bus.
4. Give the limitations of polling technique.
5. Define and differentiate simulator and emulator in the context of embedded system.
6. Compare Dataflow model and finite state model.
7. Define task and Task state.
8. Compare user threads and kernel threads.
9. List any four applications of Micro-Controller Operating System MUCOS.
10. Classify Electronic Control Unit (ESU). Give its uses.

**PART – B**

**(5×13=65 Marks)**

11. a) Explain :

i) Concept of DMA.

(6)

ii) Structural units of Embedded processor.

(7)

(OR)

b) i) Describe the working principle of incircuit emulator.

(6)

ii) Classify and explain the various types of embedded systems.

(7)



12. a) i) Give the summary of I/O devices used in embedded system. (6)  
 ii) Demonstrate the signal using a transfer of byte when using the I<sup>2</sup>C bus and also the format of bits at the I<sup>2</sup>C bus with diagram. (7)  
 (OR)
- b) i) Compare the advantages and disadvantages of data transfer using serial and parallel port/devices. (6)  
 ii) Compare the RS-232C and RS485 Serial interfaces. (7)
13. a) i) What are the issues in hardware software and co-design ? (5)  
 ii) Discuss in detail about the different phases of EDLC. (8)  
 (OR)
- b) Explain Common computation models and illustrate the purpose of each. (6)
14. a) i) Summarize the system level and task service functions of  $\mu$ c/OS. (6)  
 ii) Enumerate type of semaphores and explain the use of semaphore. (7)  
 (OR)
- b) i) Draw the Microkernel Architecture and explain the basic functions of RTOS kernel. (6)  
 ii) Explain the need for interprocess communication and IPC functions. (7)
15. a) Design architectural hardware and software units needed in smart card. (6)  
 (OR)
- b) Identify and explain hardware units needed in each of the systems :  
 i) Camera. (7)  
 ii) Automatic chocolate vending machine. (6)

## PART - C

(1×15=15 Marks)

16. Design and discuss an embedded system solution for a typical automotive system. Your answer must include design and development of necessary hardwares and software for the automotive system to incorporate efficient fuel management systems, vehicle performance monitoring systems, vehicle tracking and navigation systems.