

Reg. No. :

Question Paper Code : 52961

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Sixth Semester

Electrical and Electronics Engineering

EE 6602 – EMBEDDED SYSTEMS

(Common to: Electronics and Instrumentation Engineering/Instrumentation and Control Engineering)

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the role of in-circuit emulator?
2. Identify the role played by a watch dog timer.
3. Differentiate synchronous communication from iso-synchronous communication for serial devices.
4. Draw and label the I²C bus frame format.
5. Identify the different phases of EDLC.
6. Compare concurrent development model with object oriented model.
7. Mention the different states of threads.
8. What is cause and effect of dead lock condition in RTOS?
9. State any three features that are required in the software used in automotive applications.
10. Why are critical tasks given higher priority in comparison to ordinary tasks during embedded auto mobile application development?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain the structural units of an embedded processor in detail. (7)
(ii) With a neat diagram of a DMA controller, describe its buses and control signals. (6)

Or

- (b) (i) How is allocation of memory to program segments carried out? Explain. (7)
(ii) Illustrate a hardware timer device with its signals, clock inputs and control bits. (6)
12. (a) (i) Explain the need for serial communication bus with Communication protocol and with handshaking. (7)
(ii) How do UART and HDLC indicate the start and end of a byte in a data frame? (6)

Or

- (b) (i) Discuss in detail about serial communication using I^2C bus. (7)
(ii) List the characteristics taken into consideration when interfacing a device and a port. (6)
13. (a) (i) Explain the various objectives of EDLC. (5)
(ii) With a neat diagram explain the synchronous data flow graph model. (8)

Or

- (b) (i) How does abstraction of processes help in object oriented design? Explain. (8)
(ii) Enumerate the issues in hardware/software co-design. (5)
14. (a) (i) Differentiate process, task and threads. (5)
(ii) Define Semaphore and discuss on any three functions. Also explain how they are handled? (8)

Or

- (b) (i) Explain any task scheduling models of RTOS in detail. (8)
(ii) Discuss semaphore related functions in Micro C /OS-II. (5)
15. (a) Explain the list of tasks and priority assignments in modeling a washing machine. (13)

Or

- (b) Tabulate the features needed in the operating system of a smart card and discuss their functions. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Analyze the critical section service by a preemptive scheduler and explain its action.

Or

- (b) Identify any FIVE performance metrics that are used in Real Time Systems. Explain the importance of each of these metrics by applying them to any real time system of your choice.