Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 50544

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023

Sixth/Seventh/Eighth Semester

Electrical and Electronics Engineering

EE 8691 – EMBEDDED SYSTEMS

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

(Regulations 2017)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write three key functional requirements of an embedded system.
2. Distinguish between CISC and RISC.
3. List down at least three important features of SPI.
4. What is the role of device drivers in an embedded system?
5. What is an object – oriented model?
6. What are the processes involved in co-design?
7. Define threading and multi-threading?
8. What is priority inversion?
9. What is a prototype?
10. What are the events involved in smart card application?

PART B — (5 × 13 = 65 marks)

11. (a) With a neat diagram explain the working of direct memory access architecture and timing diagram. (13)

Or

(b) Discuss real time clock and target hardware debugging. (13)

12. (a) Explain the following communication protocols in detail: CAN BUS and I^2C BUS. (7+6)

Or

(b) Explain the I/O device ports and their characteristics. (13)

13. (a) Explain sequential programming model with an example. (13)

Or

(b) (i) Highlight the issues and challenges in software–hardware Co-design. (7)

(ii) Discuss the different phases of EDLC in detail. (6)

14. (a) Explain inter process communication in detail. (13)

Or

(b) Explain how interrupt routines are handled by RTOS. (13)

15. (a) Explain the working of automotive camera controller with suitable sketches. (13)

Or

(b) Explain embedded design concept used in debit card payment machine with necessary diagrams. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Consider the modern washing machine which is an embedded system-enabled product.

(i) Draw the functional architecture of the system and explain how software is interacting the hardware (include the necessary diagram and flow chart) (8)

(ii) Analyze the following cases: washing and spinning with normal load and overload. (7)

Or

(b) Explain state machine model for an automatic seat belt warning system with necessary diagrams and flowcharts. (15)
