

**JNTUA UNIVERSITY
PREVIOUS QUESTION PAPERS**

B.Tech IV Year I Semester (R15) Regular Examinations November/December 2018

EMBEDDED SYSTEMS

(Common to ECE & EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) State the need of separate data and address bus.
 - (b) List out any four applications of embedded systems.
 - (c) Write any two differences between Von Neumann and Harvard architecture.
 - (d) List out the chip peripherals of TM4C processors.
 - (e) What are the various parameters needed to select the embedded hardware?
 - (f) State the difference between synchronous, Iso-synchronous and Asynchronous communication from serial devices.
 - (g) Mention the uses of quadrature encoder interface.
 - (h) State the function of Watchdog timer.
 - (i) Draw the frame format of 12C communication.
 - (j) What are the advantages of adding Wi-Fi capability to the microcontroller?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Elaborate on the types of embedded processor and various memory types.

OR

- 3 Explain about the design process of an embedded system and tools needed for the design.

UNIT – II

- 4 Explain the block diagram of TM4C embedded processor in detail.

OR

- 5 Differentiate the design philosophy of CISC & RISC and list out the salient features of ARM cortex processor.

UNIT – III

- 6 Explain about the various building blocks of an embedded controller.

OR

- 7 How does an ICE differ from an emulator? Also explain the code generation tools for the development of an embedded system.

UNIT – IV

- 8 With suitable interfacing diagram, explain the functionalities of GPIO control and programming system registers.

OR

- 9 With necessary interfacing diagram, elaborate on timer and real time clock interfacing.

UNIT – V

- 10 Explain the implementation procedure and programming 12C and USB interface using TM4C.

OR

- 11 Elucidate the principles of Tiva based embedded system application using the interface protocols for communication with external devices.

B.Tech IV Year II Semester (R15) Regular Examinations April 2019

EMBEDDED SYSTEMS

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) List the types of embedded processors.
 - (b) What is the need of Watchdog timer?
 - (c) What are the differences between Von-Neumann and Harvard architectures?
 - (d) What are the main features of ARM cores?
 - (e) Write few I/O devices of embedded systems.
 - (f) What is an In-circuit emulator?
 - (g) What is the function of hibernation module?
 - (h) What is GPIO control?
 - (i) Write the differences between synchronous and asynchronous communication interfaces.
 - (j) What Baud rate?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Explain the design process of embedded systems.

OR

- 3 Explain various forms of system memory and the functions assigned to these memories in the embedded systems.

UNIT – II

- 4 With neat block diagram, explain the architecture of TM4C microcontroller.

OR

- 5 Explain in detail about various addressing modes of TM4C microcontroller.

UNIT – III

- 6 What are various building blocks of embedded systems? Explain them in detail.

OR

- 7 Explain various modes of operation of microcontroller timer and counting devices.

UNIT – IV

- 8 Explain the operation of Watchdog timer using block diagram.

OR

- 9 Explain about the interrupt management of microcontroller system.

UNIT – V

- 10 Explain the working of UART communication interface. Mention the advantages and disadvantages of UART.

OR

- 11 Draw the block diagram of smart plug with remote disconnect and Wi-Fi connectivity and explain the operation.

B.Tech IV Year I Semester (R15) Supplementary Examinations June/July 2019

EMBEDDED SYSTEMS

(Common to ECE & EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) State the significance of host and target setup.
 - (b) List out the features of embedded processors.
 - (c) Write any two differences between CISC and RISC architecture.
 - (d) Why do we need to have user space and kernel space separate?
 - (e) What are the various building blocks of embedded hardware?
 - (f) State the uses of in circuit emulator.
 - (g) Mention the advantages of memory mapped peripherals.
 - (h) State the function of PWM module.
 - (i) What is baud rate?
 - (j) Draw the interfacing circuit to interface analog sensor to the embedded controller.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Elaborate on the architectural consideration of embedded processor and its types.

OR

- 3 Explain about the programming languages and tools for embedded system design.

UNIT – II

- 4 Illustrate in detail about the ARM architecture and cortex M series.

OR

- 5 With suitable example explain the addressing modes and basics of instruction set of TM4C processor.

UNIT – III

- 6 Explain about the memories and I/O devices used in an embedded controller.

OR

- 7 What are the various system design and co-design issues in system development process? Also explain the design cycle in the development phase for an embedded system.

UNIT – IV

- 8 State the necessity of I/O pin multiplexing. With suitable interfacing diagram explain the functionalities of GPIO control.

OR

- 9 With necessary interfacing diagram, elaborate on interrupt programming and the use of interrupt vector table.

UNIT – V

- 10 Explain the implementation procedure and programming UART and SPI interface using TM4C.

OR

- 11 Elucidate the principles of Tiva based embedded networking application in detail.

B.Tech IV Year II Semester (R15) Advanced Supplementary Examinations July 2019

EMBEDDED SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) What are host and target machines?
 - (b) Mention four applications of embedded systems
 - (c) Draw the block diagram of TM4C microcontroller.
 - (d) Write any four differences between CISC and RISC.
 - (e) What are the functions of timer module in embedded systems?
 - (f) Explain about counter devices in embedded systems.
 - (g) What are the features of real time clock?
 - (h) What are interrupts?
 - (i) What are the blocks present in embedded Wi-Fi?
 - (j) Write the advantages and disadvantages of I2C protocol.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Explain in detail about various types of embedded processors.

OR

- 3 Explain various hardware and software design process of embedded systems.

UNIT – II

- 4 Explain the addressing modes of TM4C.

OR

- 5 Explain the architecture of cortex M series microcontrollers.

UNIT – III

- 6 Explain various factors considered for selection of processor for an embedded system.

OR

- 7 Explain various memories and I/O devices used in embedded systems.

UNIT – IV

- 8 Draw the block diagram of hibernation module and explain.

OR

- 9 Draw the block diagram of Quadrature Encoder interface (QEI) and explain the functions of each block.

UNIT – V

- 10 Explain the working of SPI communication protocol.

OR

- 11 Draw the block diagram and explain the architecture of IOT.

B.Tech IV Year I Semester (R15) Regular & Supplementary Examinations November/December 2019

EMBEDDED SYSTEMS

(Common to ECE & EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What is an embedded system? What are the components of embedded system?
 - Classify the processors in embedded system.
 - How is ARM processor different from other processors?
 - Write any four differences between Von Neumann and Harvard architecture.
 - Explain the role of sensors in embedded system design.
 - Draw the interconnection of external devices with microprocessor.
 - What is the purpose of using RESET and NMI?
 - What are benefits of Real Time Clock?
 - Difference between synchronous and asynchronous communication.
 - What are the advantages and disadvantages of SPI?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) Write about different types of memory devices used in embedded systems.
(b) Explain the design process of embedded systems.

OR

- 3 (a) Write about host and target concepts.
(b) What are the different types of embedded processors? Explain.

UNIT – II

- 4 (a) Differentiate the design philosophy of CISC and RISC and list out salient feature of ARM cortex processor.
(b) Explain about I/O mapped I/O vs. Memory mapped I/O.

OR

- 5 (a) Explain the block diagram of TM4C Embedded processor in detail.
(b) Explain about the addressing modes of TM4C.

UNIT – III

- 6 (a) Explain about the various building blocks of an embedded controller.
(b) Explain about the use of software tools for development of an embedded system design.

OR

- 7 (a) Explain the design cycle development of embedded system.
(b) Explain about In-Circuit Emulator (ICE) in an embedded system.

UNIT – IV

- 8 (a) With neat diagram, explain Hibernation module on TM4C.
(b) Explain the functionalities of GPIO control and programming system registers.

OR

- 9 Explain about interrupts in ARM CORTEX M4 Microcontroller.

UNIT – V

- 10 (a) What is asynchronous communication? Explain.
(b) Draw & explain the architecture of IOT.

OR

- 11 Explain the implementation procedure and programming I2C and SPI interface using TM4C.

B.Tech IV Year II Semester (R15) Regular & Supplementary Examinations September 2020

EMBEDDED SYSTEMS

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What are the functional requirements of Embedded System?
 - List the characteristics of an Embedded System.
 - Draw the generic CPSR format.
 - What are the important features of the ARM Instruction set?
 - Differentiate synchronous communication from ISO synchronous communication for serial devices.
 - List the features of CAN bus.
 - Compare serial and parallel communication.
 - What are the different types of serial communication protocols?
 - What are the IPV6 advantages for IOT?
 - Compare synchronous and asynchronous transfer modes.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) What are the different programming languages and tools used for Embedded System design?
 (b) Explain different types of memories.

OR

- 3 (a) Explain the design processes of embedded systems.
 (b) Explain different features of embedded systems.

UNIT – II

- 4 (a) What are the features of TM4C129X Microcontroller?
 (b) Explain about ARM addressing modes.

OR

- 5 Draw the block diagram of TM4C123GH6PM Microcontroller. And explain about on chip peripherals on it.

UNIT – III

- 6 (a) Explain the functionalities of RS232 and RS 485 standard serial interface with neat diagrams.
 (b) Explain about design and co-design issues in system development process of an embedded system.

OR

- 7 (a) Explain the procedure to select a processor for an embedded system.
 (b) Describe the working principle of In circuit emulator.

UNIT – IV

- 8 (a) What are memory mapped peripherals? Explain briefly.
 (b) Explain about real time clock.

OR

- 9 Explain about (i) a watchdog timer, (ii) interrupts.

UNIT – V

- 10 Draw the architecture of an IOT and explain in detail.

OR

- 11 Explain how SPI works and steps involved in SPI data transmission.

B.Tech IV Year I Semester (R15) Supplementary Examinations October 2020

EMBEDDED SYSTEMS

(Common to ECE & EIE)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What are the typical characteristics of an embedded system?
 - What are the advantages and disadvantages of embedded system?
 - In what ways CISC and RISC processors differ?
 - List out the chip peripherals of TM4C processors.
 - List the important considerations when selecting a processor.
 - What are the different communication interfaces with respect to embedded systems?
 - State the function of Watchdog timer.
 - Define Real Time Clock (RTC).
 - Define Baud rate.
 - What are the advantages of IPv6 for IOT?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) Explain the important architecture considerations for embedded systems.
 (b) Discuss about different programming languages & tools for embedded design.
- OR**
- 3 (a) What is meant by Memory? Explain the different types of memory devices: (i) ROM. (ii) RAM.
 (b) Discuss the few applications of an embedded system.

UNIT – II

- 4 (a) Compare the Von Neumann and Harvard architectures.
 (b) Explain about on-chip system peripherals.
- OR**
- 5 (a) Write about the instruction set of ARM microcontroller.
 (b) Write a short note on register sets in ARM processor.

UNIT – III

- 6 How does an ICE differ from an emulator? Also explain the code generation tools for the development of an embedded system.
- OR**
- 7 (a) Explain I/O interfacing concepts.
 (b) Explain about timer and counting devices.

UNIT – IV

- 8 (a) Draw & explain block diagram of watch dog timer?
 (b) Explain the internal blocks of Quadrature Encoder Interface (QEI).
- OR**
- 9 (a) Explain block diagram of PWM generator.
 (b) Draw and explain PWM timer in up/down count mode.

UNIT – V

- 10 (a) Explain the block diagram of TIVA UART.
 (b) Explain in detail the IOT architecture and functions of the various layers.
- OR**
- 11 (a) Write short notes on Universal Serial Bus (USB).
 (b) Describe how Wi-Fi capability can be added to a microcontroller.
