

IV B. Tech I Semester Regular Examinations, November – 2022**EMBEDDED SYSTEMS****(EXCEPT FOR ECE)****(Open Elective)****Time: 3 hours****Max. Marks: 75**

*Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks*

Unit - I

- 1 a) Define sensors? Explain the I/O subsystem. [7]
b) What is non-operational quality attributes? Explain the important non-operational Quality attributes to be considered in any embedded system design. [8]

(OR)

- 2 a) Write the details about the embedded hardware units and devices in a system. [7]
b) Compare the application-specific and domain-specifics of an embedded system. [8]

Unit - II

- 3 a) Explain briefly about watchdog timer. [7]
b) What are the various serial communication devices used in an Embedded Hardware? Explain any one of them. [8]

(OR)

- 4 a) Explain about Timer and counting devices in Embedded Hardware. [7]
b) Explain about watchdog Timer and real time clock. [8]

Unit - III

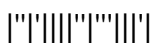
- 5 a) Discuss the Mixing Assembly with high level language and mixing high level language with assembly. [7]
b) Explain any one of Embedded firmware design approaches in detail. [8]

(OR)

- 6 a) With the help of appropriate diagrams explain the working of DMA. [7]
b) Write a note on C versus embedded C and compiler versus cross compiler. [8]

Unit - IV

- 7 a) What is deadlock? List and explain different conditions favoring a deadlock situation. [7]
b) Compare various Task scheduling algorithms in RTOS. [8]



Code No: R194104K

R19

Set No. 1

(OR)

- 8 a) Explain the different multitasking models in operating system context [7]
b) Explain the fundamental issues in hardware software co-design. [8]

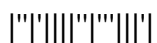
Unit - V

- 9 a) Draw and explain the integrated embedded system development environment. [7]
b) What is ROM emulator? Explain ICE based debugging in detail. [8]

(OR)

- 10 a) Explain in detail Translation tools-Pre-processors. [7]
b) Discuss Simulators and Laboratory tools in details. [8]

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1

Unit - I

- a) Explain the different classifications of Embedded Systems. Give an example for each. [7]
- b) What is Actuator? Explain its role in Embedded System Design? Illustrate with an example. [8]

(OR)

- 2 a) What is embedded firm ware explain. [7]
- b) Explain the purpose of embedded system. [8]

Unit - II

- 3 a) What is combinational circuit? Explain with example. [7]
- b) Explain briefly about wireless devices. [8]

(OR)

- 4 a) Explain the sequence of operations for communicating with an I2c slave device. [7]
- b) Explain the purpose of (i) Counting Device and (ii) Real Time Clock in an embedded system. [8]

Unit - III

- 5 a) What is Device driver? Explain about device driver programming. [7]
- b) List out the differences between an architecture specific device driver and a generic device driver. [8]

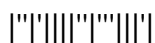
(OR)

- 6 a) Explain the conversion process from source file to object file translation. [7]
- b) Explain briefly about interrupt servicing mechanism. [8]

Unit - IV

- 7 a) Explain how thread and process are used in an embedded system. [7]
- b) Differentiate between Hardware and Software Co-Design with all the salient features of them. [8]

(OR)



Code No: R194104K

R19

Set No. 2

- 8 a) Define process? Draw the processor state transition diagram and explain it. [7]
b) Define message passing? Explain how the message passing is classified. [8]

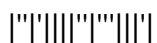
Unit - V

- 9 a) Explain the format of Hex records in an Intel Hex file. [7]
b) What are the different techniques available for embedded firmware debugging? Explain them in detail. [8]

(OR)

- 10 a) What is a monitor program? Explain role in embedded firmware debugging. [7]
b) Explain the advantages and limitations of simulator based debugging. [8]

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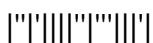


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- 1 **Unit - I**
- a) What are the different types of memories used in Embedded System design? [7]
 Explain the role of each.
- b) Explain the difference between Embedded Systems and General Computing Systems. [8]
- (OR)
- 2 a) Write and explain the classification of embedded systems. [7]
 b) Explain the onboard communication interfaces. [8]
- Unit - II**
- 3 a) Explain the role of Watchdog timer in embedded system. [7]
 b) Compare the data transfer using serial and parallel port devices along with their advantages and disadvantages. [8]
- (OR)
- 4 a) What is Latch? Draw and explain the latch. [7]
 b) Explain briefly about parallel device ports. [8]
- Unit - III**
- 5 a) Write and explain the drawbacks of assembly language based development. [7]
 b) What is Interrupt? Explain multiple interrupts with examples. [8]
- (OR)
- 6 a) Explain the advantages and disadvantages of high level language based embedded firmware development. [7]
 b) What is interrupt? Explain its role in embedded application development. [8]
- Unit - IV**
- 7 a) Discuss how ICE is useful for testing an Embedded System with neat diagram. [7]
 b) Explain the architecture of device drivers. [8]
- (OR)
- 8 a) Write and explain the basic functions of real time kernel. [7]
 b) Explain data flow graph and state machine model in embedded design. [8]



Code No: R194104K

R19

Set No. 3

Unit - V

- 9 a) Explain in detail about different files generated during the cross compilation of an Embedded C file. [7]
b) Explain the various details held by a Map file generated during the process of cross-compiling an embedded C project. [8]
- (OR)
- 10 a) Draw the compilation diagram and explain it. [7]
b) Explain in detail about below terms: [8]
i) Interpreters ii) Simulator

JNTU FAST UPDATES



Code No: R194104K

R19

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Unit - I

- 1 a) Write the history of embedded system. [7]
b) Differentiate RISC and CISC. [8]
(OR)
- 2 a) Distinguish between a sensor and an actuator. Explain their role in an embedded system with suitable examples. [7]
b) Explain about application specific embedded system with suitable example. [8]

Unit - II

- 3 a) Discuss Real time clock with respect to an Embedded Hardware. [7]
b) Compare the operation of ZigBee and Wi-Fi networks. [8]
(OR)
- 4 a) What are serial communication devices? Explain. [7]
b) Explain briefly about watchdog timer. [8]

Unit - III

- 5 a) Explain the advantages of assembly language based development. [7]
b) Write a note on C versus embedded C and compiler versus cross compiler. [8]
(OR)
- 6 a) Discuss about compiler and cross compiler with respect to Embedded Firmware. [7]
b) Explain structure in the 'Embedded-C' programming context. Explain the significance of structure over normal variables. [8]

Unit - IV

- 7 a) Explain the important Hardware Software Tradeoffs in Hardware Software Partitioning. [7]
b) Explain how to choose an RTOS. [8]



Code No: R194104K

R19

Set No. 4

(OR)

- 8 a) Write notes on Embedded software development-process. [7]
b) Explain in detail about Boundary scan. [8]

Unit - V

- 9 a) Explain various elements of an embedded system development environment. [7]
b) Explain how the compiling needs of an embedded system are different from that of general purpose computer with suitable examples. [8]

(OR)

- 10 a) Differentiate static and dynamic testing. [7]
b) Compare various Laboratory tools used for embedded system implementation and testing. [8]

