

R18

Code No: 156AV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, February - 2023

EMBEDDED SYSTEM DESIGN
(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

- Note:** i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) What is fourth generation embedded system? Give an example. [2]
- b) Mention the significance of prototype development. [3]
- c) List the components of a typical embedded system. [2]
- d) What is memory shadowing? What is the advantage of it? [3]
- e) What is the difference between static and global functions? [2]
- f) Mention the advantages of assembly language based ES firmware. [3]
- g) List different types of operating systems. [2]
- h) Write about preemptive scheduling. [3]
- i) Differentiate between stream sockets and datagram sockets. [2]
- j) Write about message queue. [3]

PART – B

(50 Marks)

2. Illustrate the various purposes of embedded system with relevant examples. [10]

OR

- 3.a) What is non-operational quality attribute? Discuss the important non-operational quality attributes examined in any design of embedded systems.

- b) Explain the different classification of embedded systems by giving example for each. [5+5]

- 4.a) What is the significance of onboard communication interface? Explain the difference between I²C and SPI communication interface.

- b) Expand the terms RISC and CISC. Compare RISC vs CISC processor. [5+5]

OR

- 5.a) Discuss the classification of working memory with implementation sketches.

- b) Write a short notes on ASICs and COTs by citing their drawbacks. [5+5]

QA QA QA QA QA QA QA QA

6.a) Explain the role of Watchdog timer in embedded system.
b) What is the difference between 'Super loop' based and 'OS' based embedded firmware design? Which one is the better approach? [5+5]

QA QA QA QA QA QA QA QA

7.a) What is Interrupt Vector Address and Interrupt Service Routine (ISR)? How are they related?
b) What is function pointer? Explain the use of function pointers. [5+5]

8.a) What are the differences between multitasking and multiprocessing? Explain.
b) Give a detail structure of task and a process. [5+5]

QA QA QA QA QA QA QA QA

9. Discuss the basic functions performed by a Real-Time kernel. [10]

10.a) What is priority inversion? What are the different techniques adopted for handling priority inversion?
b) Explain the architecture of device drivers. [5+5]

QA QA QA QA QA QA QA QA

11. Describe different functional and non-functional requirements needed in the selection of RTOS. [10]

---ooOoo---

QA QA QA QA QA QA QA QA

QA QA QA QA QA QA QA QA

QA QA QA QA QA QA QA QA

QA QA QA QA QA QA QA QA