

G. Narayanamma Institute of Technology & Science

(Autonomous)

(for Women)

Shaikpet, Hyderabad- 500 104

IV-B.Tech I-Semester *Regular/Supplementary Examinations, December -2022.*

EMBEDDED SYSTEM DESIGN

(Common to ECE & ETE)

Max. Marks: 70

Time: 03 Hours

Note:

1. Question paper comprises of **Part A** and **Part B**.
2. **Part A** is compulsory which carries 10 marks. Answer all questions in Part A.
3. **Part B** (for 60 marks) consists of **five questions** with **“either” “or”** pattern. Each question carries 12 marks and may have a,b,c as sub questions. The student has to answer any one full question.

PART-A

(Answer 05 questions. Each question carries 2 marks)

Q.No	Question	Marks	CO	Bloom's Level
<i>Q.1</i>	a) Which of this/these is/are embedded systems and Why? Washing Machine, laptop.	[02]	CO1	[L1]
	b) What is memory shadowing? What is its advantage?	[02]	CO3	[L2]
	c) Define Firmware and devise the need of it.	[02]	CO4	[L1]
	d) What is kernel space and user space?	[02]	CO3	[L2]
	e) Mention the use of a shared memory based IPC.	[02]	CO3	[L1]

END OF PART A

PART-B

(Answer 05 full questions. Each question carries 12 marks)

Q.No	Question	Marks	CO	Bloom's Level
<i>Q.2(a)</i>	Contrast embedded systems and general computing systems.	[06]	CO1	[L4]
	(b) Including detailed example explain the purpose of embedded systems.	[06]	CO1	[L2]
OR				
<i>Q.3(a)</i>	Classify and explain generations of embedded systems.	[06]	CO1	[L2]
	(b) Explain characteristics and quality attributes of embedded systems.	[06]	CO1	[L2]

- Q.4(a)** What are the different types of memories used for Program storage in Embedded System Design? [08] CO3 [L4]
- (b)** Compare General Purpose Processor (GPP) and Application Specific Instruction Set Processor (ASIP). Give an example for both. [04] CO2 [L4]

OR

- Q.5(a)** What is Actuator? Explain its role in Embedded System Design? Illustrate with an example. [06] CO2 [L2]
- (b)** Differentiate I2C and SPI communication interface. Provide the best for embedded application. [06] CO2 [L4]

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- Q.6(a)** Write details of Brown-out Protection Circuit, also include its major use. [06] CO2 [L2]
- (b)** Show the block diagram and brief about the Assembly language to machine language conversion process. [06] CO4 [L2]

OR

- Q.7(a)** List and give explanation for different embedded firmware design approaches. [05] CO4 [L4]
- (b)** Explain the following with neat diagram [07] CO5 [L2]
(i) Real Time Clock (ii) Watchdog Timer

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- Q.8(a)** Explain context switching, context saving and context retrieval. [06] CO6 [L1]
- (b)** What is the difference between a General Purpose operating systems and a Real-Time operating system? Give an example for both. [06] CO5 [L2]

OR

- Q.9(a)** Explain the different types of pre-emptive scheduling algorithms. State the merits and de-merits of each. [08] CO5 [L5]
- (b)** What is an Operating System? List the functions of operating systems. [04] CO5 [L1]

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- Q.10(a)** What is Inter Process Communication (IPC)? Give an overview of different IPC mechanisms adopted by various operating systems. [06] CO6 [L3]
- (b)** Explain the role of device drivers in embedded system design. [06] CO6 [L2]

OR

- Q.11(a)** Explain the different functional and non-functional requirements that needs to be evaluated in the selection of an RTOS. [06] CO5 [L5]
- (b)** Illustrate various multi-processing systems. [06] CO4 [L1]

END OF PART B
END OF THE QUESTION PAPER