



Roll No:

BTECH

(SEM. VI) THEORY EXAMINATION 2025-26

EMBEDDED SYSTEM

TIME: 3 HRS

M.MARKS: 70

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief.

2x7 = 14

(a)	Name the different components of embedded system hardware.	CO1	K2
(b)	Differentiate between Embedded System and Real Time Systems.	CO1	K2
(c)	Define CAN Bus.	CO2	K2
(d)	Discuss about the I/O Device Ports.	CO2	K2
(e)	What is the need of Embedded Firmware Development Environment?	CO3	K2
(f)	Define process and Threads.	CO4	K2
(g)	Mention the design issues of Embedded System Application Development.	CO5	K2

SECTION B

2. Attempt any *three* of the following:

7 x 3 = 21

(a)	Explain the different classifications of embedded systems. Explain each of them with suitable example.	CO1	K2
(b)	Describe the serial peripheral interface (SPI) and inter integrated circuits (IIC) in detail.	CO2	K2
(c)	Explain in detail the Concept of Concurrent Model and Object-Oriented Model.	CO3	K2
(d)	What are the functions of RTOS? Write difference between 'Hard' and 'Soft' real time system.	CO4	K3
(e)	Explain how microcontrollers are used in washing machines for process control and automation.	CO5	K2

SECTION C

3. Attempt any *one* part of the following:

7 x 1 = 7

(a)	Discuss the concept of Target Hardware Debugging in Embedded System.	CO1	K2
(b)	Elaborate the working and benefits of Direct memory Access (DMA) in Embedded System.	CO1	K3

4. Attempt any *one* part of the following:

7 x 1 = 7

(a)	Describe different types of embedded networks. Compare wired and wireless embedded networking systems.	CO2	K2
(b)	Explain the working principle of Serial Peripheral Interface(SPI) protocol. Describe its Master-Slave architecture.	CO2	K3

5. Attempt any *one* part of the following:

7 x 1 = 7

(a)	Describe the role of cross-compilation in embedded firmware development. Why is it necessary?	CO3	K2
(b)	Elaborate the different phases of EDLC in Embedded System.	CO3	K3

6. Attempt any *one* part of the following:

7 x 1 = 7

(a)	Explain the Concept of 'multithreading'. What are the advantages of multithreading?	CO4	K2
(b)	Explain the different multitasking models in the operating system context.	CO4	K3

7. Attempt any *one* part of the following:

7 x 1 = 7

(a)	Explain the architecture of a smart card system. Describe its components and working.	CO5	K2
(b)	Mention Automotive Applications in Embedded System Application Development.	CO5	K2