Total No. of Questions: 22

Enrollment No : _____

MEDICAPS UNIVERSITY

Faculty of Engineering

End Semester Examination May 2025

EE3CO51 Embedded Systems

Programme	:	B.Tech.	**Branch/Specialisation**	:	EE
Duration	:	3 hours	**Maximum Marks**	:	60

Note: *All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.*

Section 1 (Answer all question(s))

		Marks	CO	BL
Q1.	The first mass produced embedded system is- ○ Minuteman-I ○ Minuteman-II ◉ Autonetics D-17 ○ Appollo Guidance Computer	1	1	1
Q2.	Mean Time Between Failures(MTBF) for an embedded product is high. This means- ○ The product is highly reliable ○ The availability of the product is very high ○ The preventive maintenance required for the product is very less ◉ All of the above	1	1	1
Q3.	Which of the following is one time programmable memory? ○ SRAM ◉ PROM ○ FLASH ○ NVRAM	1	1	1
Q4.	What is the maximum number of USB devices that can be connected to a USB host? ○ Unlimited ○ 128 ◉ 127 ○ None of these	1	1	1
Q5.	Translation of assembly code to machine code is performed by- ◉ Assembler ○ Compiler ○ Linker ○ Locater	1	1	1
Q6.	Reset circuit work on _____ logic signal. ○ 0 ○ 1 ◉ 1 or 0 ○ CLK	1	2	2
Q7.	The Memory Management Unit (MMU) of kernel is responsible for- ◉ Keeping track of which part of the memory area is currently used by the processor ○ Scheduling and managing the execution of process ○ Setting up and manage the process control block ○ Interprocess communication and synchronisation	1	2	2
Q8.	Which of the following are the examples of RTOS? ○ Windows CE ○ QNX ○ Windows 2000 ◉ Both(a) and (b)	1	2	2
Q9.	Processes used Inter Process Communication (IPC) mechanisms for- ○ Communicating between process ○ Synchronising the access of shared resource ◉ Both (A) & (B) ○ None of these	1	3	1

Q10. Which among the following techniques is used for sharing data between processes? **1 4 2**

- ○ Semaphores
- ○ Shared memory
- ○ Messages
- ◉ Both (B) and (C)

Section 2 (Answer all question(s))

Marks CO BL

Q11. Define embedded system and mention its application area. **2 1 2**

Rubric	Marks
Definition of an embedded system	1
applications	1

Q12. Differentiate embedded system and general computing system. **3 1 2**

Rubric	Marks
Difference between embedded system and general computing system 1	1
Difference between embedded system and general computing system 2	1
Difference between embedded system and general computing system 3	1

Q13. (a) Explain the different characteristics of an embedded system in detail. **5 1 2**

Rubric	Marks
Each characteristics of an embedded system in detail carries same marks	5

(OR)

(b) Explain the important operational quality to be considered for an embedded system.

Rubric	Marks
Explanation of each quality carry same mark	5

Section 3 (Answer all question(s))

Marks CO BL

Q14. Compare the operation of Zigbee and Wi-Fi network. **4 2 2**

Rubric	Marks
Compare of the operation of Zigbee and Wi-Fi network (one point each), atleast 4 points	4

Q15. (a) Explain the role of different types of memories used in embedded system design. **6 2 2**

Rubric	Marks
types of memories 02 marks Explain any 03 memories 04 marks	6

(OR)

(b) Explain the function of programmable logic device. What are its advantage over fixed logic device.

Rubric	Marks
Function of programmable logic device	4
advantage over fixed logic device	2

Section 4 (Answer all question(s))

Marks CO BL

Q16. Explain the Real-Time Clock (RTC) in embedded system. **4 2 2**

Rubric	Marks
Explanation of the Real Time Clock (RTC) in embedded	4

Q17. (a) Describe the role of watchdog time system in embedded system. **6 3 2**

Rubric	Marks
Description of the role of watchdog time system in embedded system 05 Marks Diagram 01 mark	6

(OR)

(b) Differentiate superloop-based and operating system-based embedded firm designs.

Rubric	Marks
Differentiate super loop based and operating system based embed firm design in 6 points, 1 mark each	6

Section 5 (Answer all question(s))

Marks CO BL

Q18. Explain the different functions handled by the general-purpose kernel. **4 3 2**

Rubric	Marks
different function handled by general purpose kernel at least 4 points- 1 mark each	4

Q19. (a) Explain process, process states and state transition in an operating system context. **6 3 2**

Rubric	Marks
Explanation of process	2
Explanation of process states	2
Explanation of state transition in operating system	2

(OR)

(b) Explain the term multiprocessing and multitasking in operating system.

Rubric	Marks
Explanation of multiprocessing	3
Explanation of multitasking	3

Section 6 (Answer any 2 question(s))

Marks CO BL

Q20. Describe the concept of Remote Procedural Call(RPC) and sockets. **5 4 2**

Rubric	Marks
Description of Remote Procedural Call(RPC)	3
Description of sockets	2

Q21. Explain deadlocks, their favourable conditions, and how to prevent them. **5 4 2**

Rubric	Marks
Explanation of deadlocks	2
their favourable conditions	2
how to prevent them	1

Q22. Explain functional and non-functional requirements that needed to be evaluated in the selection of RTOS. **5 4 2**

Rubric	Marks
Explanation of functional requirements that needed to be evaluated in the selection of RTOS.	2.5
Explanation of non-functional requirements that needed to be evaluated in the selection of RTOS.	2.5

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