# Question Paper

## MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences (MSIS), Manipal
Second Semester Master of Engineering - ME (Embedded Systems) Degree Examination - April / May 2024
**Embedded Systems [ESD 5202]**

**Marks: 100**                                                                                    **Duration: 180 mins.**

**Monday, April 29, 2024**

**Answer all the questions.**

1) **Describe three types of IC technology. (L2, CO 1, PO 1)**                                (10)

2) **Describe different operation states, modes and access levels present in cortex M3 processors. (L2, CO 2, PO 3)**    (10)

3) **Identify the memory map for LPC1768 microcontroller. (L2, CO 2, PO 3)**                  (10)

4) **Illustrate various types of exceptions in a typical microcontroller. (L2, CO 2, PO 3)**    (10)

5) **Implement an assembly code to calculate GCD of two numbers (25,75) with comments for each instruction used. (L2, CO 2, PO 3)**    (10)

6) **Describe the main and auxiliary criteria for the selection of a particular type of ADC in a embedded system application. (L2, CO 3, PO 3)**    (10)

7) **Describe diagrammatically the working of UART communication protocol with its frame format. (L2, CO 3, PO 3)**    (10)

8) **Describe enumeration in USB Communication, discuss steps involved in enumeration process. (L2, CO 3, PO 3)**    (10)

9) **Describe Extended CAN frame format. (L2, CO 3, PO 3)**                                   (10)

10) **Describe the lifecycle of a task in RTOS. (L2, CO 4, PO 3)**                            (10)

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