

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: M.TECH
BRANCH: ECE**

**SEMESTER : II
SESSION : SP/2025**

SUBJECT: EC585 EMBEDDED SYSTEM DESIGN

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a) Explain the structure and types of Embedded systems.	[5]	
Q.1(b) Describe the basics of 8051 and embedded design verification and validation (V&V).	[5]	
Q.2(a) Draw a connection diagram of external RAM (8KB) and ROM (4KB) with 8051. What do you understand about an Intel Hex file? Explain with an example.	[5]	
Q.2(b) Write an ASM program to input 100 bytes of data from port 0, divide each byte by 2, and store the result in DATA. (assume input data is >2 and the result will be only an integer). (3)	[5]	
Draw and explain the architecture of an FPGA. (2)		
Q.3(a) Design and draw an interfacing diagram of an LCD with an 8051 microcontroller. Also, provide the initialization steps for the LCD to send data to the display.	[5]	
Q.3(b) Design an embedded system to display wind speed on an 8051 microcontroller-based LED display system.	[5]	
Q.4(a) How do you understand a signal conditioner for a sensor interface? (3)	[5]	
What is the procedure for selecting a perfect sensor for any project design? (2)		
Q.4(b) Explain a multichannel data logging system and draw a complete interfacing diagram with eight channels of I/P and four channels of output for LED display and alarm generation.	[5]	
Q.5(a) Draw and explain the working and interfacing of the following three actuators - 1. Relay, 2. Solenoid, 3. DC Motors, 4. Servo Motor, and 5. BLDC Motor	[5]	
Q.5(b) Explain Networking and communication protocols in IoT application implementation.	[5]	

:::28/04/2025:::E