CLASS: M. Tech   SEMESTER : II
BRANCH: ECE   SESSION : SP/19

SUBJECT: EC570 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.

Q.1(a)	Discuss the various common characteristics of a real-time embedded system. Briefly explain them.	[5]
Q.1(b)	Paraphrase "hardware-software co-design" with respect to embedded system.	[5]
Q.2(a)	Write the name of at least 15 special function registers (SFRs), which are embedded in microcontroller 8051.	[5]
Q.2(b)	List the constituent of FPGA. Briefly explain each of them.	[5]
Q.3(a)	Diagram a buzzer driver circuit in such a way that the buzzer is 'ON' when a high pulse is sent from FPGA and briefly explain it.	[5]
Q.3(b)	Diagram an Optical Sensor Interfacing (with Infrared sensor) circuit for measuring the speed of a rotating disc. Analyse and explain the same.	[5]
Q.4(a)	Schematize the sensor interfacing and data processing setup. Evaluate and appraise significance of its constituents.	[5]
Q.4(b)	Design a 3-bit PRSG (pseudo random sequence generator) with non-zero seed test pattern and tabulate the generated test pattern. Evaluate and appraise its significance.	[5]
Q.5(a)	What are the issues of interfacing DC motor directly with microprocessor, microcontroller, and FPGA? Design a DC motor interfacing circuit, which may solve the issues.	[5]
Q.5(b)	Assume that one DC motor is configured with a control system through a motor driver (L293D). Design and develop a digital system to operate the motor in the clockwise and anti-clockwise directions and stop it for the predetermined period.	[5]

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