Sr. No - 511102

January 2023

M. Tech. VLSI, 1st SEMESTER

Microcontrollers and Programmable Digital Signal Processors (MVL-102)

Time: 3 Hours **Max. Marks:75**

Instructions:
1. *It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.*
2. *Answer any four questions from Part -B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART -A

Q1 (a) Which registers can be accessed by Thumb Instructions in ARM? (1.5)

(b) What are the sources of exceptions in ARM? (1.5)

(c) What is interrupt sequence in ARM? (1.5)

(d) How many steps are there in DSP C6XXX pipelining? (1.5)

(e) What is SYSTICK timer? (1.5)

(f) Enumerate four applications of LPC controller. (1.5)

(g) How may general purpose timers the LPC 1768 has? Name them. (1.5)

(h) Which approach VLIW follows to achieve parallelism? (1.5)

(i) What is circular addressing in DSP? (1.5)

(j) What is PLL controller? (1.5)

PART -B

Q2 (a) How pipelining is implemented in ARM Cortex? (7)

(b) Draw the Map of ARM Cortex, what are its salient features? (8)

Q3 (a) How is Supervisor Call (SVC) and Pendable Service Call (PendSV) handled in ARM? (8)

(b) How does NVIC of LPC 17XX work. Show its salient features. (7)

Q4 (a) What are the features of GPIO in LPC17xx? (7)

(b) Draw and explain the block diagram of Timers in LPC? (8)

Q5 (a) What is the role of Barrel shifter in Programmable DSP? (7)

(b) Explain the MAC unit of Programmable DSP Processors. (8)

Q6 (a) Explain processor benchmarking in details. (7)

(b) What is DSP? Explain code composer Studio for application development. (8)

Q7 (a) Design any filter using DSP, show all the processes. (8)

(b) How can you interface a transducer to Cortex M3 or LPC 17XX processor (7)

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