Question Paper

Exam Date & Time: 09-Jan-2024 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

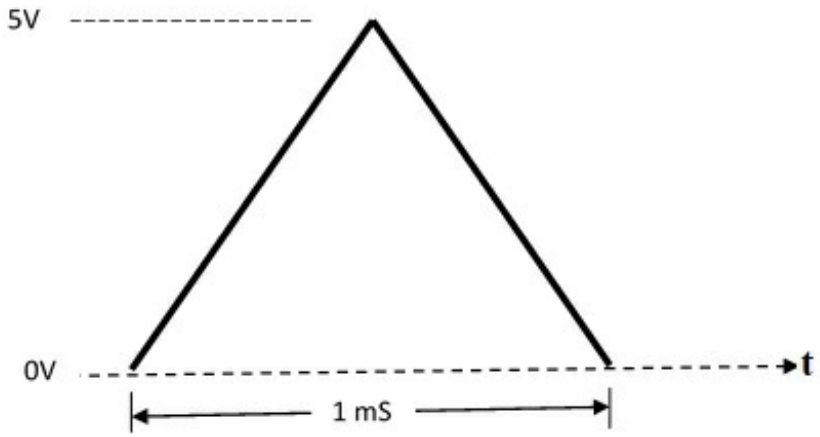
FIFTH SEMESTER B.TECH END SEMESTER MAKEUP EXAMINATIONS, JAN 2024

MICROCONTROLLER BASED SYSTEMS [BME 3154]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Missing data may be suitably assumed
Draw neat diagrams wherever neecessary

1)		How do you enable or disable and modify the default priorities of the interrupting sources in the 8051 microcontroller? Illustrate.	(4)
	A)		
	B)	How do you access internal and external memory indirectly in the 8051 microcontroller? Illustrate with examples.	(3)
	C)	How do you generate a time delay of 1 mSec using Timer-1 of the 8051 in 16-bit mode? Explain with illustration.	(3)
2)		Using an appropriate interfacing device and signal from the 8051 microcontroller, develop a circuit to de-multiplex the multiplexed Address/Data bus of the microcontroller.	(4)
	A)		
	B)	Develop a program for the 8051 microcontroller to convert a 2-digit hexadecimal number available in the memory address 1200H in to ASCII codes and store the codes in the internal memory locations starting from 30H onwards.	(3)
	C)	Develop an embedded-C program for the 8051 microcontroller to toggle the P1.0 pin continuously.	(3)
3)		Design an 8051 microcontroller based system to generate the periodic waveform shown in figure below.	(4)
	A)		
	B)	Interface two 2KB SRAM chips to the 8051 microcontroller and assign appropriate address to each memory chip. Draw the designed interface circuit.	(3)
	C)	Develop a 3-digit display system using the 8051 microcontroller and Common Anode type seven-segment display units, and explain how do you take care of flickering or blinking of the display?	(3)

4)		Design an 8051 interface circuit to control a unipolar stepper motor using half-step sequence. Draw the design and write the required program.	(5)
	A)		
	B)	Frame control words for an 8255 PPI interface with the 8051 microcontroller for: (i) Port A & C as output ports, and Port B as an input port in simple I/O mode (ii) To set 3rd bit of Port-C (PC3)	(3)
	C)	Is it possible to implement stack in the ARM Cortex M3 microcontroller without using the default stack pointer? Justify your answer with an illustration.	(2)
5)		An outpatient unit of a hospital having an average patient turn-out of 100 Patients/day, requires a token counter to be installed in the patient waiting area. Develop a microcontroller based solution for this requirement.	(4)
	A)		
	B)	Design a matrix type hexadecimal keyboard interface for the 8051 microcontroller and write an algorithm to read the keyboard.	(4)
	C)	Compare the programmers models of the 8051 and the ARM Cortex M3 microcontrollers.	(2)

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