Reg. No.



V SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKEUP EXAMINATIONS, DEC 2016 - JAN 2017

SUBJECT: MICROCONTROLLER BASED SYSTEM DESIGN [ELE 3106]

REVISED CREDIT SYSTEM

Time:	3 Hours	Date: 07 January 2017	MAX. MARKS: 50
Instru	ctions to Candidates:		
	 Answer ALL the question 	15.	
	 Missing data may be suit 	ably assumed.	
	 Support all your program 	ns with relevant comments.	
1A.	Describe the following with Also give relevant examples	h suitable diagrams and compare their merits s.	and demerits.
	i. Princeton (Von Neu	imann) and Harvard architectures.	
	ii. Single chip Microco	ntroller and Single chip Microprocessor.	(04)
1B.	Set of 10 data bytes are sto check each data byte and s locations starting at 61H an	ored in successive locations starting from 50H, ave the bytes that are higher than 60 and lowe ad count of such numbers in 60H	Write ALP to er than 100 in (03)
1C.	 Write 8051 programs to i. Determine if R3 of b copy the value to R3 ii. Obtain the 2's comp 	pank '0' contains the value 0, if so copy it to R3 of Bank 2'. Diment of the '8' bit data available at external	of bank 1, else RAM location
	8050H and store the iii. Multiply '8' bit data	e result in the next memory location. in R6 and R7 registers and save the result in R4	and R5. (03)
2A.	Describe the different addr the help of relevant exampl	ressing modes supported by the instruction set les.	: of 8051 with (04)
2B.	Explain the functions of the	e following pins with respect to 8051 microcont	roller
	\overline{PSEN} . \overline{EA} and ALE		(03)
2C.	Write an 8051 ALP to obta assume crystal frequency a	ain delay of 1.6 sec using 8 bit registers as de s 11.0592MHz.	elay registers, (03)
3A.	Describe the operation of pulses? Use timer 0 of 80 frequency of the external pu crystal frequency as 11.059	8051 timers in counter mode. What is the so 051 in counter mode and write an ALP to c ulse applied to it. Display the pulse value at P0 an 02MHz.	urce for clock letermine the nd P1. Assume (04)
3B.	Assume two keys 'Wave 1' Write an 8051 assembly pu display a continuous square pressed, then display a squ timer '0' in mode '2' to obta	and 'Wave 2' connected to P0.6 and P0.7 pins rogram to check the key status. If Wave 1 is e wave of 1 KHz with 40% duty cycle at P1.2 pin are wave of 5 KHz with 75% duty cycle at the hin the required delay.	s respectively. pressed, then n. If Wave '2' is same pin. Use (04)

- **3C.** Along with relevant instructions, write the procedural steps involved in programming the 8051 to receive the data serially. *(02)*
- **4A.** Show the interfacing circuit to interface a 16x2 LCD to 8051 microcontroller and write an ALP to display "Time Out" in second line starting at 4th position.
- **4B.** Assume an n X n matrix key board interfaced to 8051. Describe the steps involved (algorithm) in detecting the key pressed. Suggest a method to overcome key bounce problem.
- **4C.** Show the interfacing circuit to interface DAC 0800 to 8051 and write an ALP to obtain the following waveform. Wave shape between 3V and 5V amplitude is sinusoidal.



- **5A.** Highlight the salient features of Berkley RISC 1 model. Compare ARM 7 processor architecture with Berkley RISC 1 architecture. (03)
- **5B.** Describe the following instructions of ARM7. Describe each field. Illustrate with an example.
 - i. ADC {condn} {S} Rd, Rm, operand 2.

ii. CMP {condn} Rn, operand2

5C. Write an ARM7 ALP to multiply two 32 bit numbers available in memory locations 0x9000 - 0x9003 and 0x9004 - 0x9007, add the 64 bit product to another 64 bit number stored in 0x9008 - 0x900B and 0x900C - 0x900F. Store the 64 bit result in next eight locations. (03)

(04)

(03)

(03)