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Manipal Institute of Technology, Manipal (A Constituent Institute of Manipal University)															D D D D D D D D D D D D D D D D D D D			
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	SUB	JEC	T: MIC	CROC	ONT	ROL	LER B	ASE	DS	YST	ΈM	I DE	ESIC	GN	[EL	E 3	11]	
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	Т	ime: 3	B Hours		08 January 2016						MAX. MARKS: 50							
		Instructions to Candidates:																
	✤ Answer ANY FIVE FULL questions.																	
	 Missing data may be suitably assumed. 																	
		**	Suppor	rt all yc	our prog	grams	with rele	vant c	comm	ients.								
1A.	Descril	be the	followin	g and co	ompare	their r	nerits and	deme	rits.									
	I.	I. Assembly language and high level language programming for 8051.																
	II. CISC and RISC Processor architecture.														(04)			
1B.	Explain in brief, different addressing modes of 8051 instruction set with relevant examples.														(04)			
1C.	Write an ALP to exchange 5 bytes of data starting from location 30H with 5 bytes of data starting from location 40H.												ta	(02)				
2A.	Explain the functions of Program Counter (PC) and Program status word (PSW) registers of 80 microcontroller in detail.												of 805	51	(03)			
2B.	I. Write 8051 ALP to find largest number in a given array of six numbers stored starting external RAM location 2000H. Store the largest number in external RAM location 2006H								g fro 6H	m								
	II. Write 8051 ALP to add two 16 bit numbers stored at 30H, 31H and 32H, 33H and result in 20H, 21H and 22H.									nd sto	ore tl	ne	(04)					
2C.	Write 8051 instructions to obtain a software time delay of 1.6 seconds, assuming crystal freque to be 12MHz. (Do not use timers). For the same program written calculate the time delay if cry frequency is changed to 10MHz.											quen cryst	cy al	(03)				
3A.	Describe the steps involved in programming 8051 timers in timer mode '2'. Give reletinstructions for each step.										eleva	nt	(03)					
3B.	Assume that speed of a rotating body is converted to square pulses (one pulse per revolution) us a transducer and applied to P3.5/T1 pin of 8051. Write an 8051 ALP to determine the speed of rotating body in rpm and display it at port '2' and '3'.) usii of tł	ng ne	(03)			
3C.	Compare interrupt and polling techniques with respect to servicing various devices connected 8051.List the various interrupts of 8051 along with their interrupt vector address and prior Describe the sequence of operation inside 8051 when it is interrupted by external interrupt '0'.												cted riorit)'.	to y.	(04)			
4A.	Differentiate between asynchronous and synchronous serial communication. Describe in detail the asynchronous serial communication protocol.											ne	(03)					

- 4C. Describe the functions of all the 14 pins (signals) of a 16X 2 LCD. List the merits of using LCD by comparing it with seven segment LED display.
- 5A. Write an algorithm to display the key code of the key pressed with regard to a matrix key board interfaced to 8051.
- 5B. Show the interfacing circuit to interface ADC 0808 to 8051and write an 8051 'C' program to convert the analog input at channel-6 to digital equivalent and store the digital output of ADC at port '1'. Use port '0' for receiving the digital output of ADC and port '2' pins for the other interfacing signals. (04)
- 5C. Interface a 4 pole stepper motor with 18 rotor teeth to 8051. Two push button keys are connected to pins p1.0 and p1.1. When push button connected to p1.0 is pressed, write an 8051 ALP to rotate the motor in clockwise direction through 120° once and rotate the motor in anticlockwise direction through 90° once , if push button connected to P1.1 is pressed.
- 6A. Interface following external memory devices to 8051. Show the complete interfacing circuit. Avoid fold back space. (Use absolute decoding).
 - I. 8K X 8 Program EPROM starting at 0000H.
 - II. 2K X 8 Data RAM -Starting address B000H. (05)
- 6B. Give the complete details of the control word of 8255 for I/O mode of operation and BSR mode of operation. Write an 8051 ALP to obtain a 1000Hz, 40% duty cycle waveform at PC4 pin of 8255. Assume XTAL = 11.0592MHz and take base address of 8255 as COH
 (05)

(03)

(02)

(04)