

SCHOOL OF INFORMATION SCIENCES (SOIS) SECOND SEMESTER MASTER OF ENGINEERING - ME (Embedded Systems) DEGREE EXAMINATION - APRIL / MAY 2017 Wednesday, 26, 2017 Time : 10:00 AM - 1:00 PM Embedded Systems [ESD 612]

Marks: 100

Duration: 180 mins.

Answer all the questions.

1)	Briefly explain Fundamental Architecture of cortex m3 (10) processor with suitable block diagram (10 MARKS)			
2)	Briefly explain Program status register of ARM Cortex m3 ⁽¹⁰⁾ processor and also mention about instructions to access PSR?			
3)	Write short note on following registers with suitable (10) examples a) R14 Link register			
	(3			
	marks)			
	b) R15 Program			
	counter (2			
	marks)			
	C) RI3 Stack pointer (2 marks)			
	(S Marks)			
	(2 marks)			
4)	Write short note on rotate and shift instructions (10) supported by ARM Cortex m3 processor with suitable examples (10 MARKS)			
5)	Explain following instructions (10)			
	a) BFC R0,#4,#8 b)BFI R1,R0,#8,#16 c)SBFX R1.R0.#8.#4			
	d) REVSH R2 e)SXTB R1 (2 x 5 =10 MARKS)			
6)	Briefly explain MPU and also comment of low power, high ⁽¹⁰⁾ energy efficiency of cortex m3 processor? (7+3 MARKS)			
7)	Briefly explain the memory map and bus interface of (10) cortex m3 processor with suitable block diagram (6 +4 MARKS)			
8)	List and explain about Registers required to configure (10)			

and program ADC peripheral	of LPC 1769	
Microcontroller?	(10 MARKS)	
Assuming that Temperature s	ensor is interfaced to	(10

⁹⁾ Assuming that Temperature sensor is interfaced to ⁽¹⁰⁾ Analog input 0(ad0) of on chip ADC and LED is interfaced to Port 0.6 pin , Push Button is interfaced to PORT 1.9 . Write a C Program using CMSIS Library to monitor Push button , If push button is pressed (If your reading value HIGH ON PIN 1.9) Program ADC to read value from sensor and transfer temperature value through Uart at 9600 Baud rate or else if push button is not pressed (if your reading a value LOW on Pin 1.9) turn LED ON introduce delay of 100ms using Timer and turn LED OFF introduce delay of 100ms using Timer.

MARKS)

¹⁰⁾ Briefly Explain Need of Real time kernel FREERTOS for embedded (10) applications and also mention some important features of FREERTOS?

(4+6 MARKS)

(10