LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **PHYSICS**

SECOND SEMESTER – **APRIL 2016**

PH 2814 - EMBEDDED SYSTEMS

Date: 20-04-2016 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

Part – A

Answer **ALL** questions. **(10x2=20)**

1. List any two major differences between a microprocessor and a microcontroller.
2. Develop a program for μC8051 to find the factorial of the byte in R1 of bank1 and store it in R2 of bank2.
3. Write a note on the DPTR register of μC8051.
4. Develop a program segment for μC8051 to initialize Timer1 in mode 1.
5. Which timer in what mode is used for Baud rate generation in μC8051.
6. Explain the function of the PIC instruction BTS 15h, 1.
7. State the functional differences between the instructions DECF and DECFSZ of PIC.
8. Write notes on the 3-stage pipeline of ARM7 processors.
9. Write a note on the Barrel Shifter of ARM7 processors.
10. Explain the "mode" bits of the program status register of ARM7.

Part – B

Answer any **FOUR** questions**.** **(4x7.5=30)**

11. With neat block diagrams explain the memory organisation of μC8051.
12. Develop an ASM program to generate 10 KHz in P0.0 and 8 KHz in P0.1 of μC8051 using timer interrupts. The crystal frequency of the controller is 12MHz.
13. Illustrate with an example for each, all the Arithmetic and Logical instructions of PIC.
14. Write notes on the STACK and the CALL and RCALL instructions of PIC16 processors.
15. Discuss the role of the PINSEL register of ARM7.
16. Develop ASM code for ARM7 processors, to set lower order 10 bits of P0 as output and the higher order 22 bits of P0 as input. Explain the code in detail.

Part – C

Answer any **FOUR** questions**.** **(4x12.5=50)**

17. A switch is connected to P0.0 and 8 LEDs to P1.0…P1.7. Develop a program for μC8051 to make them glow in binary ascending order if the switch is ON and glow left to right if the switch is OFF.
18. A μC8051 is connected serially to an IBM PC. Write a program for μC8051 to transfer repeatedly the message "LOYOLA IS THE BEST", stored in an array serially at 4800 baud, 8-bit data and 1 stop bit.
19. With a detailed block diagram, explain the internal architecture of PIC16 series microcontroller.
20. With an example for each, explain any twelve instructions which operate on fileReg operand.
21. With an example for each, explain in detail all the load/store multiple instructions of ARM7.
22. Develop an ASM program for LPC2148 to convert the AD0.3 anlalog input and send it to P1 repeatedly using software polling. Functions of pin15 are, P0.30 / AD0.3 / EINT3 / CAP0.0.

****