# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SECOND SEMESTER – APRIL 2017

**16PPH2MC01- EMBEDDED SYSTEMS**

Date: 19-04-2017          Dept. No.          Max. : 100 Marks
01:00-04:00

## Part – A

**Answer ALL questions.**                                        **(10 x 2 =20)**

1. State why a microcontroller is referred to as a system on chip.

2. Write a note on the STACK of µC8051.

3. Develop a program to copy the contents of the external RAM location 1000h to internal RAM location 20h of µC8051.

4. Explain the role of SBUF register in µC8051.

5. Which timer in what mode is used for Baud rate generation in µC8051?

6. Write a note on the D flag of PIC instructions.

7. Taking a suitable example, explain the SWAPF instruction of PIC.

8. What is the role of the "lr" register of ARM7?

9. Write a note on the register set of ARM7 processors.

10. Explain the differences between "ARM" and "THUMB" modes of ARM7.

## Part – B

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

11. Write notes on all the Boolean Manipulating Instructions of µC8051.

12. Develop an ASM program to generate 10 KHz in P0.0 of µC8051 using timer0 interrupt and also to continuously transfer data from P1 to P2. The crystal frequency of the controller is 12MHz.

13. Explain the role of each bit in the status register of PIC16F877A processor.

14. List the addressing capabilities for data of the PIC processors.

15. Write detailed notes the hardware interrupts of LPC2148.

16. State seven salient features of the load/store architecture of ARM7 processors.

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## Part – C

17. Develop an ASM program for µC8051 to sort in ascending order a byte array of 20h elements in external Data RAM.

18. A µC8051 microcontroller is connected serially to an IBM PC and an 8 bits A/D convertor is connected to µC8051. Write a program for µC8051 to collect data from A/D convertor 100 times per second and send the same to the PC serially. Do this repeatedly. Assume the crystal frequency to be 11.0952 MHz.

19. Discuss the on-chip peripheral and analog features of PIC16F877A processor.

20. With an example for each, explain any twelve instructions which operate on fileReg operand.

21. With an example for each, discuss the modes of addressing available in ARM state of ARM7 processors.

22. Write detailed notes on the PINSEL registers of LPC2148. Also develop the code to define pin 15 as AD0.3. Functions of pin15 are, P0.30 / AD0.3 / EINT3 / CAP0.0 **(8+4.5)**

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