 **ST.JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

SUPPLEMENTARY EXAMINATION APRIL 2018

 **B.Sc. ELECTRONICS – VI SEMESTER**

 **EL 6212: Microcontroller and Embedded Systems**

(For supplementary candidates)

Do not write the register number on the question paper

Please attach the question paper along with the answer script.

(**Attach the question paper with the answer script**)

**Time: 3 Hrs Maximum Marks: 100**

This question paper has two printed pages and three parts.

**PART A**

Attempt any five 5X12=60

1. a. Draw the internal architecture block diagram of PIC16F877A.

b. Write a note on PIC oscillators. 8+4

1. a. Mention the bits of INTCON register and their significance.

b. Write a note on watchdog timer. 7+5

3. a. Explain types of addressing modes in PIC16F877A with proper example.

 b. Write any six differences between RISC and CISC architectures. 6+6

4. a. With the help of a proper diagram explain the interfacing of a keyboard with PIC16F877A.

 b. Write and describe any five instructions of PIC16F877A. 7+5

 5. a. Discuss any six design constraints (metrics) that a designer should consider while designing an embedded system. Write a brief note on optimizing the design constraints.

 b. Write any four salient features of DSP chips. 8+4

6. a. Write a note on bus arbitration.

b. Draw basic architecture of a general purpose processor. Write any three advantages of

 a general purpose processor over a single purpose processor. 6+6

7. a. Explain the memory organization of PIC16F877A.

 b. Discuss the software development process. 8+4

 **PART B**

**Attempt any five 5X6=30**

8. Write a program with comments to initialize Port A as digital I/O with 0 to 3 pins as inputs and 4 and 5 as outputs.

EL\_6212\_B\_15

9. Write an assembly language program to initialize Timer 0 to increase on every low to high transition on TOCKI pin and cause interrupt on overflow.

10. Draw a block diagram to show the interfacing of a DAC with PIC and write a program to generate square wave output.

11. Write a program to find whether a given number is palindrome or not?

12. Customize a single purpose processor for finding GCD of two numbers.

13. a. For a Standard single purpose processor ‘Timer’, calculate the number of clock cycles needed to obtain duration of 3 μs from a clock cycle of 100 MHz?

b. Draw the block diagram of a Pulse Width Modulator.

14. Write a program to multiply two 8-bit numbers.

**PART C**

**Attempt any five 5X2=10**

15. Which type of memory architecture is used in PIC16F877A? Justify.

16. If [W-reg]=7F’h. What will be the output after executing ANDLW 25’h.

17. How many instruction cycles are needed to execute one instruction (except branch instruction) of PIC 16F877A?

18. Can a relay be directly connected to a port pin of PIC16F877A for interfacing? Justify.

19. What are the events that can wake the device from sleep mode?

20 Justify why unit cost of a GPP is very low even though manufacturers invest a large amount for NRE cost?

21. Write any two classes of applications where ASIP is used.

EL\_6212\_B\_15