Task 1 answers

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Section: 3

B.NO: 69

a) Describe PIC16f877A:

PIC16F877A is an 8-bit microcontroller from Microchip Technology with 40 pins.

- **OSC1 and OSC2** connected to the clock used for defining the amount if MHz the PIC16F877A will work on.
- **Port A** from 0 to 5 analog port can only be connected to digital if adcon1 is included in the code.
- **Port E** from 0 to 2 analog.
- **MCLR** master Clear Reset input is used to reset the program when the button is pressed.
- **Port B** from 0 to 7 a digital port used for all types of connection and the only port that can be used for interrupts.
- **Port C** from 0 to 7 same as port B but can't be used with interrupts.
- **Port D** same as port C.

b) Explain:

- **Alu (Arithmetic Logic Unit) :** The ALU is responsible for performing arithmetic and logical operations it is the is a fundamental component for executing the instructions in the CPU.
- **Status and Control Register:** It is a special register that stores important flags and control bits related to the

CPU's operation. The control bits in this register allow the programmer to enable or disable various features of the microcontroller, such as interrupt enable, bank switching, and power-saving modes.

- **Program Counter (PC):** It is a register that keeps track of the memory address of the next instruction to be fetched and executed. It is automatically incremented after each instruction fetch, ensuring the microcontroller proceeds to the next instruction in memory.
- **Flash Program Memory:** The Flash Program Memory is the non-volatile memory where the user's program code is stored. It holds the instructions that the microcontroller executes during normal operation.
- **Instruction Register (IR):** The Instruction Register is a temporary storage location used to hold the instruction fetched from the program memory before it is decoded and executed.

c) Examine:

Port A4 not like all ports doesn’t have an internal transistor so when connecting an LED to it the LED won’t work.

d) Comparison:

Point of compare	ATMega328P	PIC16f877A
Memory Size	FlashMemory:32KB SRAM: 2KB EEPROM: 1KB	FlashMemory:14KB SRAM: 368 bytes EEPROM: 256bytes
Power consumption	Power consumption varies based on clock frequency, activity, and sleep modes.	Power consumption also varies based on clock frequency, activity, and the use of power-saving features.
Pin count	The most common being 28-pin DIP and 32-pin QFN packages.	40-pin DIP package.

The choice between the two depends on the project needed. If more memory is needed with lower pin count, then ATMega328P is better. If you need more I/O pins and you don’t require a lot of memory, then PIC16f877A is better.