1. List the Flynns Classification BL1 CO1

Ans) • Flynn's classification divides computer into 4 major groups:

1. SISD (Single Instruction stream, Single Data stream)

2. SIMD (Single Instruction stream, Multiple Data stream)

3. MISD (Multiple Instruction stream, Single Data stream)

4. MIMD (Multiple Instruction stream, Multiple Data stream

2. Analyze Cache Coherence? BL2 CO1

Ans) cache coherence is the consistency of shared resource data that ends up stored in multiple local caches. When clients in a system maintain caches of a common memory resource, problems may arise with inconsistent data, which is particularly the case with CPUs in a multiprocessing system

3. Explain DMA with neat sketch? BL1 CO2

4. What are the characteristics of multiprocessor? BL1 CO2

1. Parallel Processing: This requires the use of many processors at the same time. These processors are designed to do a particular task using a single architecture. Processors are generally identical, and they operate together to create the effect that the users are the only individuals who are using the system. In reality, several others are trying to use the system in the first place.

2. Distributed Computing: In addition to parallel computing, this distributed processing requires the use of a processor network. Each processor in this network can be thought of as a standalone computer with the ability to solve problems. These processors are diverse, and each one is typically assigned to a separate job.

3. Supercomputing: This entails using the quickest machines to address large, computationally difficult issues. Supercomputers used to be vector computers, but nowadays, most people accept vector or parallel computing.

4. Pipelining: Besides supercomputing, this is a method that divides a task into multiple subtasks that must be completed in a specified order. Each subtask is aided by the functional units. The devices are connected serially, and they all work at the same time.

5. Vector Computing: This is a method that divides a task into multiple subtasks that must be completed in a specified order. Each subtask is aided by the functional units.

The devices are connected serially, and they all work at the same time.

6. Systolic: Pipelining is similar, but the units are not organized linearly. Systolic steps are often tiny and numerous, and they are conducted in lockstep. This is more commonly used in specialized hardware like image or signal processors.

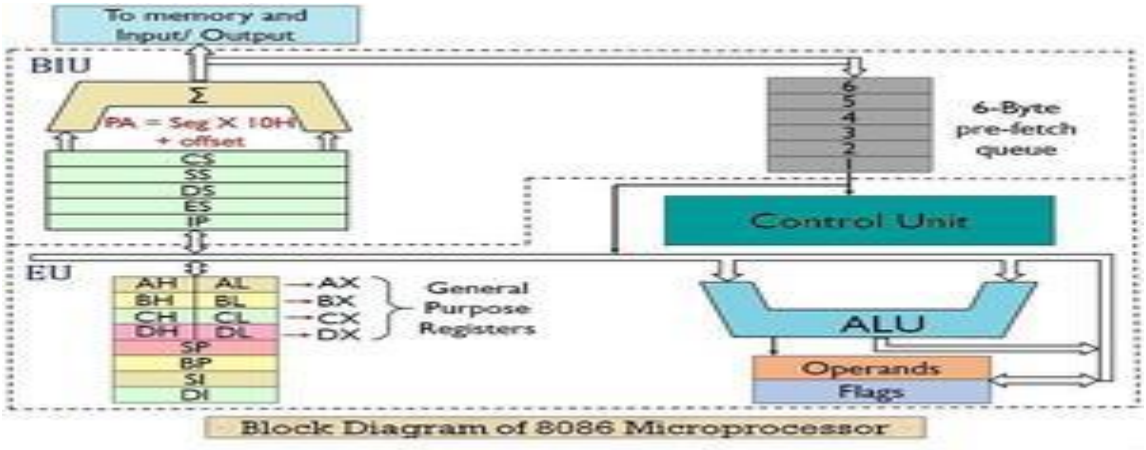
5. Differentiate microprocessor and microcontroller? BL2 CO3

MICROPROCESSOR	MICROCONTROLLER
Center of a computer system.	Center of embedded system.
Memory and I/O components are external to it.	Memory and I/O components are internal to it.
Large Circuit	Smaller Circuit
Not compatible with compact systems	Compatible with compact systems.
Higher cost	Lower Cost
High Power Consumption	Low Power Consumption
Mostly don't have power features	Mostly have power features.
Mainly present in personal computers.	Mainly present in washing machines, music players, and embedded systems.
Less number of registers.	More number of registers.
Follows Von Neumann model	Follows Harvard architecture
Made on a silicon-based integrated chip.	Byproduct microprocessors and peripherals.
RAM, ROM, and other peripherals are absent.	RAM, ROM, and other peripherals are present.
Has an external bus to interface with devices.	Uses an internal controlling bus for communication.
Has a high speed.	Speed depends on the architecture.
Ideal for general purpose to handle more data.	Ideal for the specific applications.
Complex and Expensive	Simple and affordable
Requires more instructions	Requires less instructions

PART-B

Answer ALL questions 3x10= 30M

6. Explain 8086 architecture with a neat diagram? BL2 CO1



The 8086 is a 16-bit microprocessor introduced by Intel in 1978. It became one of the most successful and influential microprocessors, laying the foundation for the x86 architecture, which is still widely used today.

Here are the key components and features of the 8086 architecture:

1. Registers:

- General-purpose registers: The 8086 has eight 16-bit general-purpose registers, named AX, BX, CX, DX, SI, DI, BP, and SP. Each register can be used for various purposes, such as storing data, addresses, or operands.

- Segment registers: The 8086 has four segment registers, named CS, DS, SS, and ES. These registers are used to hold segment addresses, which are combined with the offset to form physical memory addresses.

- Instruction pointer (IP): The IP register stores the offset within the code segment of the next instruction to be executed.

2. Execution Unit:

- Arithmetic and Logic Unit (ALU): The ALU performs arithmetic and logical operations, such as addition, subtraction, AND, OR, XOR, etc.

- Control Unit: The control unit manages the execution of instructions and controls the flow of data within the processor.

3. Bus Interface Unit (BIU):

- Instruction Queue: The BIU includes an instruction queue that prefetches up to six bytes of instructions from memory, allowing for faster execution.

- Address Generation Unit (AGU): The AGU calculates the physical memory address based on the segment address and offset.

4. Memory:

- The 8086 supports a maximum addressable memory of 1 megabyte (2^20 bytes). Memory is organized into segments, each of which can have a size of up to 64 kilobytes (2^16 bytes).

- The segment:offset addressing scheme is used to access memory, where a 16-bit segment address is combined with a 16-bit offset to form a 20-bit physical address.

5. Interrupts and I/O:

- The 8086 supports both hardware and software interrupts, allowing the processor to respond to external events.

- I/O operations are performed using dedicated instructions, such as IN and OUT, which transfer data between the processor and peripheral devices.

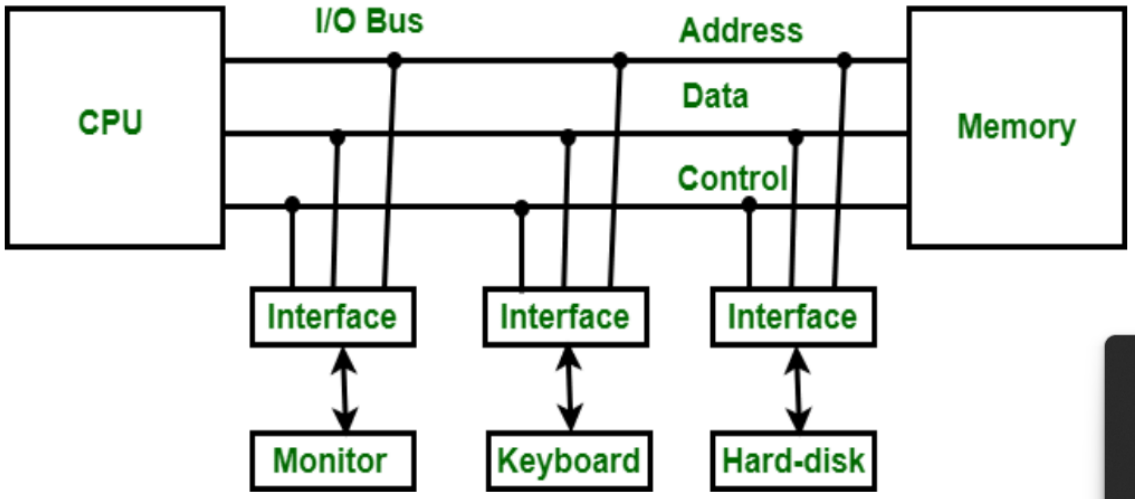
This is a brief overview of the 8086 architecture. While I cannot provide a diagram directly, you can easily find 8086 architecture diagrams online for a visual representation.

(OR)

7. Describe pipelining and explain its types? BL3 CO1

8. Explain why we need an input output interface with a neat diagram BL2 CO2

Introduction to Input-Output Interface Input-Output Interface is used as an method which helps in transferring of information between the internal storage devices i.e. memory and the external peripheral device . In micro-computer base system, the only purpose of peripheral devices is just to provide special communication links for the interfacing them with the CPU. To resolve the differences between peripheral devices and CPU, there is a special need for communication links.



Functions of Input-Output Interface:

- It is used to synchronize the operating speed of CPU with respect to input-output devices.
- It selects the input-output device which is appropriate for the interpretation of the input-output device.
- It is capable of providing signals like control and timing signals.
- In this data buffering can be possible through data bus.
- There are various error detectors.
- It converts serial data into parallel data and vice-versa.
- It also converts digital data into analog signal and vice-versa.

(OR)

9. Explain Asynchronous Data Transfer? BL2 CO2

10. List the Characteristics &applications of 8051 Microcontroller BL2 CO3

The 8051 microcontroller is a popular and widely used 8-bit microcontroller architecture developed by Intel. Here are the characteristics and applications of the 8051 microcontroller:

Characteristics of 8051 Microcontroller:

1. 8-bit Architecture: The 8051 is an 8-bit microcontroller, which means it operates on 8-bit data at a time. It has an 8-bit ALU (Arithmetic Logic Unit) and registers.
2. Harvard Architecture: The 8051 follows the Harvard architecture, where separate program and data memories are used, allowing simultaneous access to both program instructions and data.
3. On-chip Memory: The 8051 microcontroller typically includes on-chip memory, which consists of ROM (Read-Only Memory) for program storage and RAM (Random Access Memory) for data storage.
4. Peripherals and I/O Ports: The 8051 microcontroller is equipped with various built-in peripherals and I/O ports, including timers/counters, UART (Universal Asynchronous Receiver-Transmitter), interrupt controller, ADC (Analog-to-Digital Converter), and GPIO (General Purpose Input/Output) ports.
5. Low Power Consumption: The 8051 microcontroller is designed to operate at low power, making it suitable for applications where power efficiency is essential.
6. Instruction Set: The 8051 has a compact and efficient instruction set, which includes a wide range of instructions for performing arithmetic and logical operations, data transfer, branching, and I/O operations.
Applications of 8051 Microcontroller:
1. Embedded Systems: The 8051 microcontroller is widely used in embedded systems applications, including consumer electronics, industrial automation, home appliances, automotive systems, and medical devices.
2. Robotics: Due to its compact size, low power consumption, and versatile peripherals, the 8051 microcontroller finds applications in robotics for controlling motors, sensors, and actuators.
3. Home Automation: The 8051 microcontroller is commonly used in home automation systems to control and monitor various devices, such as lighting, temperature, security systems, and smart appliances.
4. Automotive Electronics: In the automotive industry, the 8051 microcontroller is utilized in engine control units (ECUs), car alarms, dashboard displays, and other vehicle subsystems.
5. Instrumentation and Measurement: The 8051 microcontroller's ability to interface with sensors, analog-to-digital converters, and other measurement devices makes it suitable for

instrumentation and measurement applications.

6. Educational Purposes: The 8051 microcontroller is often used in educational settings to teach embedded systems programming, as it provides a relatively simple and accessible platform for learning.

These are some of the key characteristics and applications of the 8051 microcontroller. Its versatility, ease of use, and availability of development tools and resources have contributed to its popularity in a wide range of industries and applications.

(OR)

11. Explain 8051 micro controller architecture?