

USN 

1	C	R	M	E					
---	---	---	---	---	--	--	--	--	--



**Internal Assessment Test 1 – Oct. 2018**

Sub:	Mechatronics	Sub Code:	15ME754	Branch:	ME		
Date:	16/10/2018	Duration:	90 min's	Max Marks:	50		
<u>Answer any FIVE FULL Questions</u>							
					MARKS	CO	RBT
1	Explain the following technology related microprocessor: i. RAM    ii. ALU    iii. Address bus    iv. Fetch cycle.				[10]	CO3	L2
2	With the help of neat sketch explain the architecture of a microprocessor and state the functions of each element of the microprocessor				[10]	CO3	L2
3	Write    i. short notes on registers used in 8085 microprocessor. ii. difference between microprocessor and microcontroller				[10]	CO3	L2

USN 

1	C	R	M	E					
---	---	---	---	---	--	--	--	--	--



**Internal Assessment Test 2 – Oct. 2018**

Sub:	Mechatronics	Sub Code:	15ME754	Branch:	ME		
Date:	16/10/2018	Duration:	90 min's	Max Marks:	50		
<u>Answer any FIVE FULL Questions</u>							
					MARKS	CO	RBT
1	Explain the following technology related microprocessor: i. RAM    ii. ALU    iii. Address bus    iv. Fetch cycle.				[10]	CO3	L2
2	With the help of neat sketch explain the architecture of a microprocessor and state the functions of each element of the microprocessor				[10]	CO3	L2
3	Write    i. short notes on registers used in 8085 microprocessor. ii. difference between microprocessor and microcontroller				[10]	CO3	L2

USN 

1	C	R	M	E					
---	---	---	---	---	--	--	--	--	--



**Internal Assessment Test 2 – Oct. 2018**

Sub:	Mechatronics	Sub Code:	15ME754	Branch:	ME		
Date:	16/10/2018	Duration:	90 min's	Max Marks:	50		
<u>Answer any FIVE FULL Questions</u>							
					MARKS	CO	RBT
1	Explain the following technology related microprocessor: i. RAM    ii. ALU    iii. Address bus    iv. Fetch cycle.				[10]	CO3	L2
2	With the help of neat sketch explain the architecture of a microprocessor and state the functions of each element of the microprocessor				[10]	CO3	L2
3	Write    i. short notes on registers used in 8085 microprocessor. ii. difference between microprocessor and microcontroller				[10]	CO3	L2

4	Explain the construction and working of an external gear pump.	[10]	CO4	L2
5	List the types of pressure control valve and explain pressure reducing valve with neat diagram.	[10]	CO4	L2
6	Sketch and explain types of sliding spool valve.	[10]	CO4	L2
7	Design a hydraulic circuit for controlling a double acting hydraulic cylinder.	[10]	CO4	L3

CI

CCI

HOD

4	Explain the construction and working of an external gear pump.	[10]	CO4	L2
5	List the types of pressure control valve and explain pressure reducing valve with neat diagram.	[10]	CO4	L2
6	Sketch and explain types of sliding spool valve.	[10]	CO4	L2
7	Design a hydraulic circuit for controlling a double acting hydraulic cylinder.	[10]	CO4	L3

CI

CCI

HOD

4	Explain the construction and working of an external gear pump.	[10]	CO4	L2
5	List the types of pressure control valve and explain pressure reducing valve with neat diagram.	[10]	CO4	L2
6	Sketch and explain types of sliding spool valve.	[10]	CO4	L2
7	Design a hydraulic circuit for controlling a double acting hydraulic cylinder.	[10]	CO4	L3

CI

CCI

HOD

i]

ii]

RAM:- Random - access memory is a form of computer data storage that stores data and machine code currently being used. A random - access memory device allows data items to be read or written in almost the same amount of time irrespective of the physical location of data inside the memory.

iii]

ALU:- Arithmetic logic unit is a combinational digital electronic circuit that performs arithmetic and bitwise operations on integer binary numbers. This is in contrast to a floating - point unit, which operates on floating point numbers.

iv]

Address Bus:- An address bus is a computer bus architecture used to transfer data between devices that are identified by the hardware address of the physical memory, which is stored in the form of binary numbers to enable the data bus to access memory storage.

v]

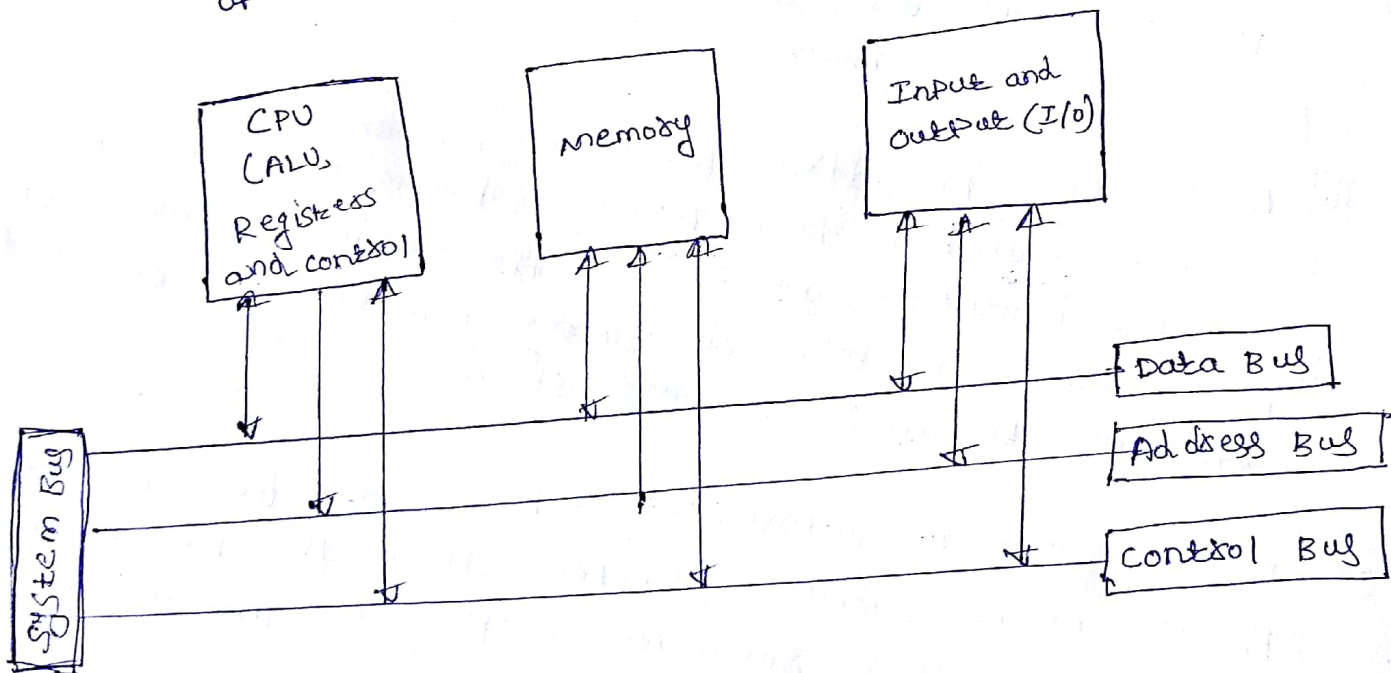
Fetch cycle:- The instruction cycle is the basic operational process of a computer system. It is the process by which a computer retrieves, a program instruction from its memory.

2]

with the help of neat sketch explain the architecture of a microprocessor and state the functions of each element of the microprocessor.

Ans:

- i] 16-bit program counter which contains the memory address of the next instruction.
- ii] The 16-bit stack pointer to maintain a pushdown stack anywhere in memory.
- iii] six 8-bit registers designated as B, C, D, E, H & L which can be used individually or in pairs. The permitted pairs are BC, DE & HL only.
- iv] 8-bit Accumulator register in which always one of the operand is stored.
- v] Five 1-bit flags namely carry (CY), zero (Z), sign (S), parity (P) and Auxiliary carry (AC)
- vi] Two temporary registers which are not program addressable and are used only for internal execution of instructions.



3] i] short notes on registers used in 8085 microprocessor.

Ans:-

Immediate addressing mode

In this mode, the 8/16-bit data is specified in the instruction itself as one of its operand for example;

MVI, 20H

Register addressing mode

In this mode the data is copied from one register to another. For example; MOV R, B: means data is register B is copied to register R.

Direct addressing mode

In this mode the data is directly copied from the given address to the register. For example LDB 5000H;

Indirect addressing mode

In this mode, the data is transferred from one register to another by using the address pointed by the register for ex: MOV R,

Implied addressing mode

This mode doesn't require any operand; the data is specified by the opcode itself. Here effective address is calculated by the microprocessor. This type of addressing requires several accesses to retrieve the data which is to be loaded into the register for ex; CMP.

ii]

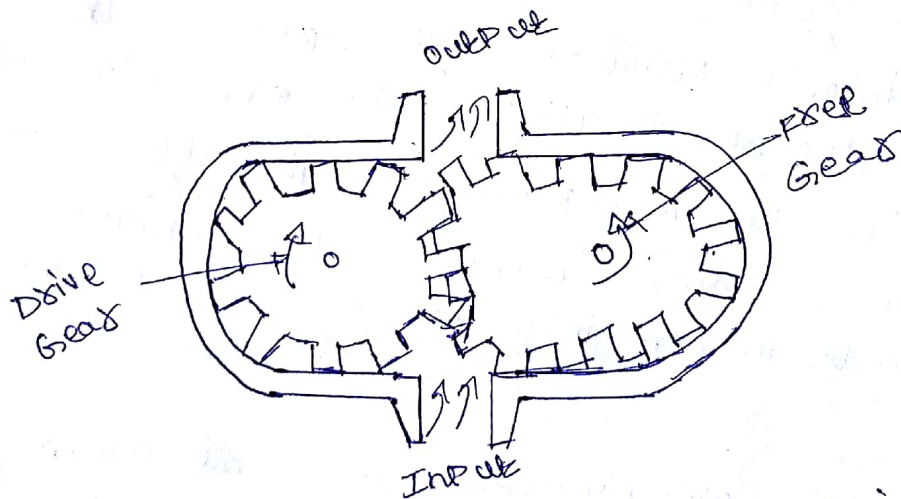
Difference between microprocessor and microcontroller.

## Microprocessor

## Microcontroller

i] Microprocessor I/O components are connected externally	Microcontroller I/O components are connected internally
ii] Heat of component of system	Heat of embedded system
iii] Large circuit	Small circuit
iv] High cost	Low cost
v] Less no of register	more no of register
vi] used in PC	used in washing machine
vii] used in 32/64 bits	used in 8/16 bits

4] Explain the construction and working of an external gear pump.



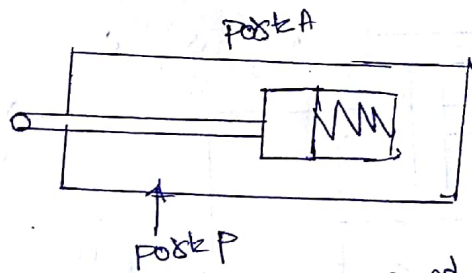
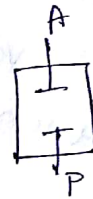
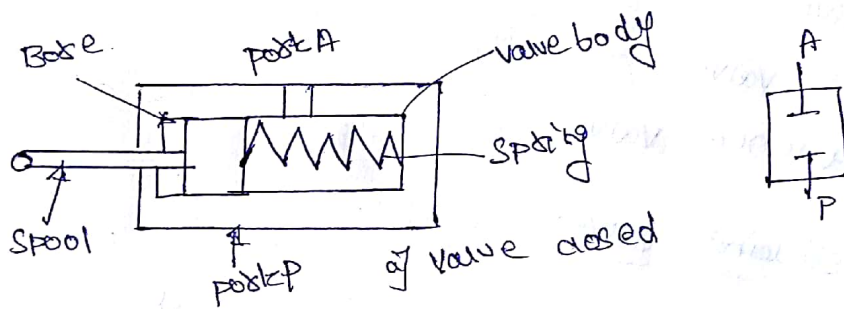
→ Gear pump develops flow by carrying fluid between the teeth of two meshed gears. one gear is driven by the driven shaft and turning the other.

→ The second type of valve is pressure reducing valve. This type of valve (which is normally open) is used to maintain reduced pressures in specified locations of hydraulic system. It is actuated by downstream pressure and tends to close as its pressure reaches the valve setting. Schematic diagram of pressure reducing valve as shown in the above fig.

A pressure reducing valve uses a spring loaded spool to control the downstream pressure. If the downstream pressure is below the valve setting, the fluid flows freely from the input to the output.

6] sketch and explain types of sliding spool valve.

Ans:



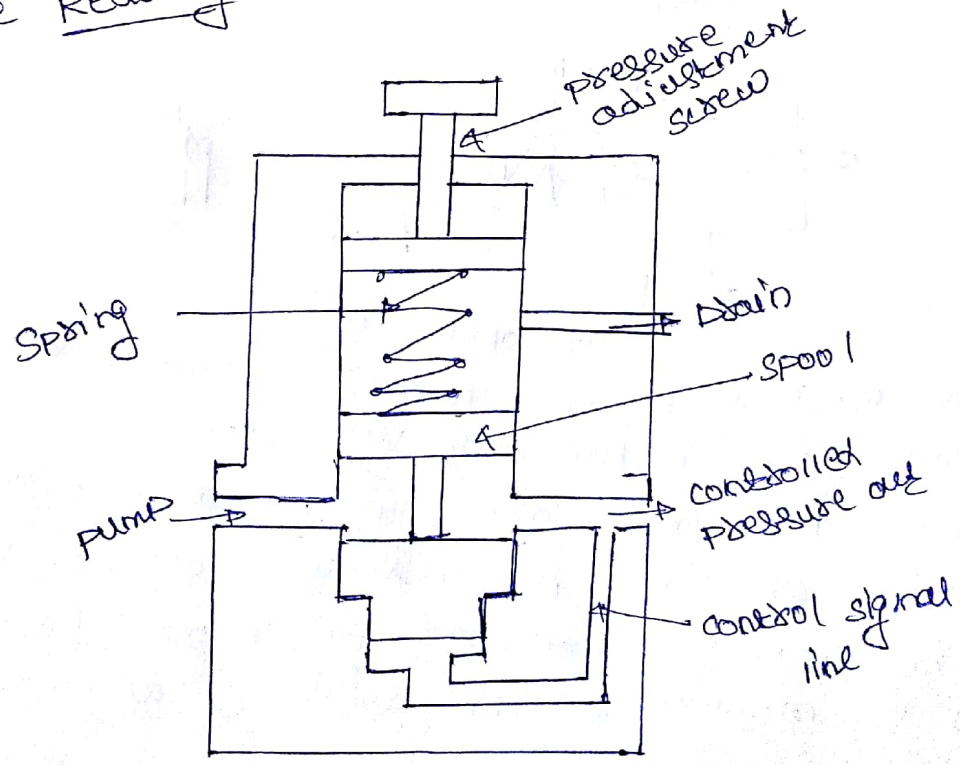
The simplest spool type of directional control valve is check valve with two ports. This valve is also called two-way valve. They are available as normally closed valves. They are usually manually actuated or actuated by pilot (hydraulic) as the valve is an solenoid actuated.

→ which is free. The pumping chambers formed between the gear teeth are enclosed by the pump housing and the side plates. A low pressure region is created at the inlet as the gear teeth separate. As a result fluid flows in and is carried around by the gears. As the teeth mesh again at the outlet, high pressure is created and the fluid is forced out. Fig shows the construction of a typical external gear pump.

5] Ans: The types of pressure control valve are:-

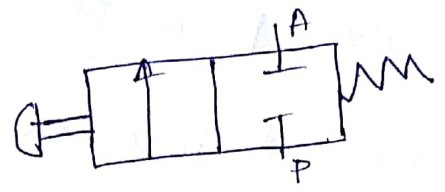
- i] Pressure Reducing Valve
- ii] Unloading Valve
- iii] Counterbalance Valve
- iv] Pressure Sequence Valve

6] Pressure Reducing Valve:-



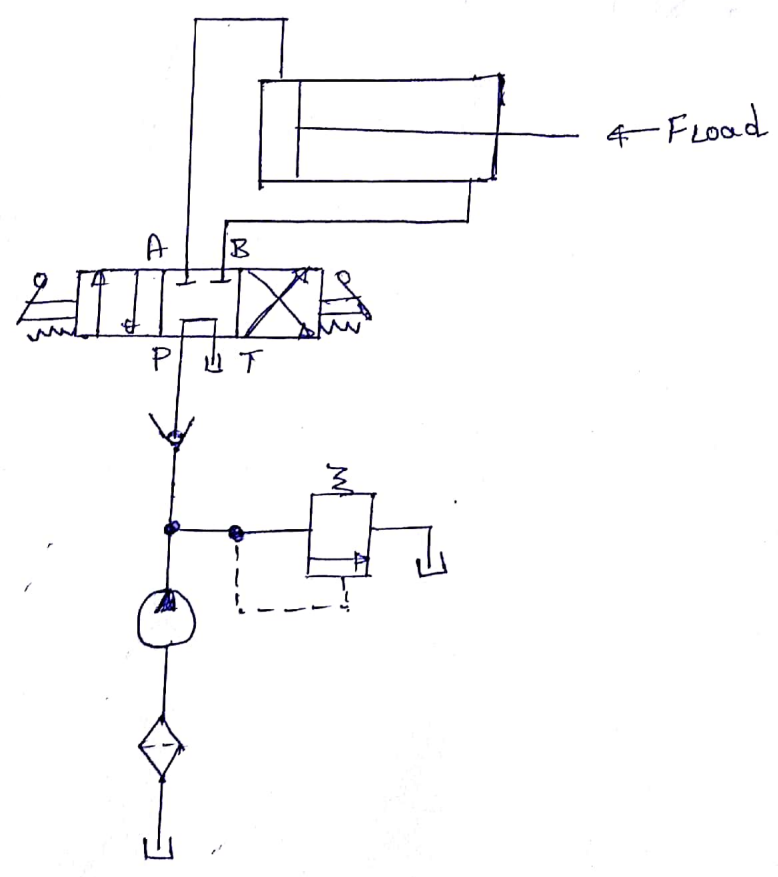


→ They are usually actuated pilot (hydraulic actuation) manual, mechanical, solenoid actuated in 5.21 as the valve is un-actuated by the action of spring hence the flow from port P to A is blocked, when actuated (presence of hand force) the valve is opened thereby connecting port P to A.



7] Design a hydraulic circuit for connecting a double acting hydraulic cylinder.

Ans:-



Ans: when the 4/3 valve is in its neutral position (tandem design) the cylinder is hydraulically locked and the pump is unloaded back to the tank.

→ when the 4/3 valve is actuated into the flow path the cylinder is extended against its load as oil flows from port P through port A, oil in the rod end of the cylinder is free to flow back to the tank through the four-way valve from port B through port T.

→ when the 4/3 valve is actuated into the slight-envelope configuration, the cylinder retracts as oil flows from port P through port B, oil in the blank end is returned to the tank via the flow path from port A to port T.