

Solution and Paper of
Advanced Microprocessor (EL302)

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Qns 1. (i) Write the name of various addressing modes of 8086?

Ans Various addressing modes of 8086

- (a) Register addressing mode
- (b) Immediate " "
- (c) Direct addressing mode
- (d) Indirect addressing mode
- (e) Implicit Addressing mode
- (f) Segment Addressing mode.

(ii) Write the name of Instruction set of 8086.

Ans Instruction set of 8086

- (a) Data transfer instruction
- (b) Arithmetic instruction
- (c) Logical instruction
- (d) Shift and Logical Instruction
- (e) Branch instruction
- (f) Loop instruction
- (g) flag manipulation instruction
- (h) String Instruction.

(iii) Explain function of \overline{BHE} signal of 8086.

Ans Bus high enable signal is used to indicate the transfer of data over the high order ($D_8 - D_{15}$) data bus.

(iv) What is Control register and Control word.

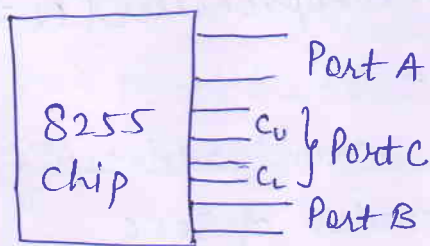
Ans Register which is internal to 8255 chip is called control register.

The content of control register are known as control word.

Such

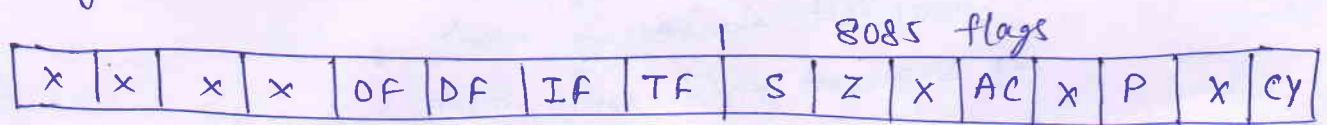
(v) Draw the basic 8255 Input/Output ports.

Ans



Qns 2 Explain flag register of 8086 microprocessor.

Ans flag register is used to indicate the status of result after any operation.



Carry flag (CY) \Rightarrow Carry flag show that there is carry or borrow beyond the MSB.

Parity flag (P) \Rightarrow $P = 1$ if no. of 1's in lower byte are even.
 $P = 0$ if no. of 1's in lower byte are odd.

Auxiliary Carry \Rightarrow If any carry from D_3 bit to D_4 bit, then AC will be set.

Zero flag \Rightarrow zero flag show the result of operation is zero or not

$Z = 1$ if result zero
 $Z = 0$ if result not zero

Sign flag is replica of D_7 bit of result.

Overflow flag \Rightarrow It is set whenever sign bit is modified. This indicate that result is out of range.

Trap flag \Rightarrow It is used to interrupt the program execution after each step, when set.

Interrupt flag \Rightarrow By setting and resetting the interrupt flag, interrupt can be enabled and disabled respectively.

Ans

Direction flag :- This flag is used with string operations.

If direction flag is reset, the string is processed from its beginning with first element having lowest address

If direction flag is set, the string is processed from high address towards to low address

Qns 3 Explain programmable peripheral Interface (8255 chip)

Ans

PA ₃	1	40	PA ₄
PA ₂	2	39	PA ₅
PA ₁	3	38	PA ₆
PA ₀	4	37	PA ₇
\overline{RD}	5	36	\overline{WR}
\overline{CS}	6	35	RESET
GND	7	34	D ₀
A ₁	8	33	D ₁
A ₀	9	32	D ₂
PC ₇	10	31	D ₃
PC ₆	11	30	D ₄
PC ₅	12	29	D ₅
PC ₄	13	28	D ₆
PC ₀	14	27	D ₇
PC ₁	15	26	V _{CC}
PC ₂	16	25	PB ₇
PC ₃	17	24	PB ₆
PB ₀	18	23	PB ₅
PB ₁	19	22	PB ₄
PB ₂	20	21	PB ₃

8255
chip

(1) Parallel Ports

Port A: contains 8 pin (PA₀-PA₇) for receiving/sending data. It is used as 8-bit parallel port

Port B: contains 8 pin (PB₀-PB₇) for receiving/sending data. It is used as 8-bit parallel port.

Such

Port C :- used as 8-bit parallel port. It can be divided into 4 bit part: Upper (C_u) and Lower (C_l).

It contains 8 pins ($PC_0 - PC_7$) for receiving/sending data. Port C pins can also used for handshake signals.

(2) Control Logic

\overline{RD} (Read) : When it goes low, μP read data from a select input/output port of 8255.

\overline{WR} (Write) : When it goes low, μP write into a select input/output port of 8255.

RESET :- It clear the control register and set all ports in input mode.

(3) Address Logic

A_0, A_1 : Combination of these two is used to identify the address of various ports and control register.

\overline{CS} (chip select) : When it goes low, chip will be selected.

\overline{CS}	A_1	A_0	Port selected
0	0	0	Port A
0	0	1	Port B
0	1	0	Port C
0	1	1	Control register
1	x	x	8255 not select

Such