



## Mumbai University | 2018 Sem 5 | Computers | Extc | Microprocessors

### Viva Questions – New Syllabus

The image features a man with dark hair and a beard, wearing a dark grey button-down shirt, standing in front of a chalkboard. The chalkboard has various handwritten notes in white chalk, including the number '16' and some technical terms like 'AL/S'. Overlaid on the right side of the image is a large, semi-transparent dark grey shape containing promotional text. Inside this shape, the word 'MICROPROCESSORS' is written in yellow capital letters. Below it, the text 'Crash Course @Rs 999/-' is displayed in white. At the bottom of the shape, the words 'Learn online' are written in white. The overall composition suggests an advertisement for an online crash course in Microprocessors.

Learn the full subject at:

**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**

**Your CRASH COURSE in your Pocket!**



## 8086 Based Questions

### **External Examiner**

How many pins does 8086 have?

Q: 1

### **You**

8086 is a 40 pin IC.

### **Internal Examiner**

8086 Address Bus and Memory?

Q: 2

### **You**

8086 has a 20-bit address bus.  
Therefore it can access 1 MB memory.

### **External Examiner**

8086 Data Bus and ALU?

Q: 3

### **You**

8086 has a 16-bit data bus and a 16-bit ALU.  
This means it can transfer 16-bits in one cycle and also operate on 16-bits in 1 cycle. Therefore 8086 is called a 16-bit microprocessor.

### **Internal Examiner**

Explain pipelining?

Q: 4

### **You**

Fetching the next instruction while executing the current instruction is called pipelining. It saves time. It fails whenever there is a branch. The instruction fetched is no longer valid and hence has to be discarded.

### **Internal Examiner**

Explain GPRs of 8086. Do they also have some special uses?

Q: 5

### **You ~ Bharat Sir's Student**

There are 4 16-bit GPRs called AX, BX, CX & DX. They can also be used as 8 independent 8-bit GPRs: AL, AH; BL, BH...

They also have some special uses:

AX - Accumulator; BX - Memory pointer;

CX - Count Register; DX - 32-bit Accumulator along with AX.



**External Examiner**

How Many Segments are in 8086?

Q: 6

**You ~ Bharat Sir's Student**

*There are 4 segments: Code, Stack, Data and Extra.*

**Internal Examiner**

What is the max and min size of a segment and why?

Q: 7

**You ~ Bharat Sir's Student**

*Max size: 64 KB. This is because offset addresses are of 16 bits. 16 Bytes. This is because formula of Physical address is segment address x 10h plus offset address. This puts a minimum gap of 10h bytes between two segments, which means 16 bytes.*

**Bharat Acharya Education**

Good Going... Keep it up ☺

All the best!

**External Examiner**

What are the advantages of segmentation?

Q: 8

**You ~ Bharat Sir's Student**

*We can access 1 MB memory using 16 bit addresses.*

*Moreover, the memory becomes more organized and overlaps are prevented between code, stack and data. [www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)*

**External Examiner**

Name Segment and offset registers?

What is the difference between SP and BP?

Q: 23 (Some questions were removed as SPARC is excluded from new syllabus )

**You ~ Bharat Sir's Student**

*Segment registers: CS, SS, DS, ES. Offset Registers: IP, SP & BP, SI, DI. SP and BP, both are for Stack Segment.*

*SP gives offset address of the top of stack. It is used for Push and Pop. BP gives offset address of any location of the stack. It is used for random access of the stack.*



**External Examiner**

Why is memory banking done?  
How many banks are there?

Q: 24

**You ~ Bharat Sir's Student**

*8086 has a 16-bit data bus.*

*Memory banking is done to access 16-bit data, which is stored in two consecutive locations. Hence memory is divided into 2 banks, Even bank and Odd Bank, also called Lower and Higher banks respectively.*

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)

**Internal Examiner**

How are the memory banks selected?

Q: 25

**You ~ Bharat Sir's Student**

*Draw A0 and BHE table from #BharatSir notes.*

**Internal Examiner**

Can we access locations 24000H and 24001H simultaneously?

Q: 26

**You ~ Bharat Sir's Student**

*Yes. By Ignoring A0, both these locations have the same bit pattern on A1-A19. Locations are selected on the basis of A1-A19, whereas A0 and BHE are used to select the banks.*

*Such data is called "Aligned Data".*

**Internal Examiner**

Can we access locations 24001H and 24002H simultaneously?

Q: 27

**You**

*No. Even after Ignoring A0, these two locations don't have the same address. So they will have to be accessed in two cycles.  
Such data is called "Misaligned Data".*

**Bharat Sir**

*Shabbaash! I was sure you could answer that ☺*

*Keep it up!*



**External Examiner**

Give advantages of 8086 ALU over 8085 ALU?

Q: 28

**You ~ Bharat Sir's Student**

8086 has a 16-bit ALU compared to 8085, which had an 8-bit ALU.

8086 ALU can perform MUL and DIV, which 8085 could not.

8086 ALU does not depend upon Accumulator for most of its operations, whereas 8085 had an Accumulator based ALU.

**External Examiner**

Explain Flag register of 8086?

Q: 29

**You ~ Bharat Sir's Student**

Please refer #BharatSir notes for diagram and answer.  
Show examples from #BharatSir lecture notes if asked.

**External Examiner**

How is overflow determined?

Q: 30

**You ~ Bharat Sir's Student**

OF is determined by Ex-Or of C7 and C6.

It basically means that the result is out of range for a signed number.

Range for 8-bit signed number (-80h...00h...+7Fh).

Range for 16-bit signed number (-8000h...0000h...+7FFFh).

**External Examiner**

Why are DF, IF and TF called Control Flags?

Q: 31

**You ~ Bharat Sir's Student**

They are used by the programmer to control different operations.

DF: Controls direction for String Instructions.

IF: Controls enabling and disabling of interrupts.

TF: Controls Single Stepping used for debugging of programs.

**Bharat Acharya Education**

All this is much easier than you think and wildly interesting.

Stop mugging up and wasting your chance to learn a beautiful subject...

Start Learning... right now!

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)



**External Examiner**

What is the size of the Prefetch queue? Why?  
When is the Queue Refilled? Why?

Q: 32

**You ~ Bharat Sir's Student**

*The Prefetch Queue is of 6-bytes as it is the max size of an instruction.  
It is refilled whenever two bytes are empty as 8086 has a 16-bit data bus.*

**External Examiner**

What is the advantage of using String Instructions?

Q: 33

**You ~ Bharat Sir's Student**

*String instructions are fetched and decoded only once but executed repeatedly.  
So they can perform large transfers very fast.*

**External Examiner**

Difference between MUL and IMUL?

Q: 34

**You ~ Bharat Sir's Student**

*MUL is used for unsigned numbers. IMUL for signed.*

**External Examiner**

Difference between SUB and CMP?

Q: 35

**You ~ Bharat Sir's Student**

*Both perform Subtraction. SUB will store the result and affect the flags.  
CMP will not store the result. Will only affect the flags.*

**External Examiner**

Where is TEST instruction used?

Q: 36

**You ~ Bharat Sir's Student**

*To check a Semaphore in Multiprocessor Systems for principle of Mutual Exclusion.*

**External Examiner**

How do you interchange the nibbles of a number?

Q: 37

**You ~ Bharat Sir's Student**

*Rotate it 4 times: MOV CL, 04h, ROL AL, CL; This will Interchange nibbles of AL.*



**External Examiner**

Where is ADC used?

Q: 38

**You ~ Bharat Sir's Student**

*To add 2 large numbers.*

*Lower Bytes are added using ADD, higher Bytes using ADC.*

**External Examiner**

Where is DAA used?

Q: 39

**You ~ Bharat Sir's Student**

*To add two BCD numbers (Decimal Numbers). First enter the numbers, Add them, Perform DAA, by its adjustment logic, it gives the correct BCD answer.*

**External Examiner**

MOV AL, 25H, DAA;

Show the working of DAA in this example?

Q: 40

**You ~ Bharat Sir's Student**

*Won't work. DAA stands for Dec Adjust "After Addition"!*

**Sponsored ①**

All this is much easier tp understand than to mug up.

**Start learning... NOW!**

Learn the full course on your laptop/ phone.

Visit: [www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)

**External Examiner**

How can we make any bit of a register “0”?

Q: 41

**You ~ Bharat Sir's Student**

*To make any bit 0: AND that bit with “0” & remaining bits with “1”*

*To make any bit 1: OR that bit with “1” & remaining bits with “0”*

*To complement a bit: XOR that bit with “1” & remaining bits with “0”*



**External Examiner**

What is the use of various String Instructions?

Q: 42

**You ~ Bharat Sir's Student**

*MOVS: To transfer a block as it is.*

*LODS & STOS: To Manipulate and Transfer a block*

*CMPS: To Compare two strings*

*SCAS: To Search for a number in a string.*

**External Examiner**

Transfer block form 12345H to 54678H using MOVS?

Q: 43

**You ~ Bharat Sir's Student**

*Initialize as follows: DS: 1000H, SI: 2345H, ES: 5000H & DI: 4678H*

**External Examiner**

How do we perform NAND, NOR or XNOR?

Q: 44

**You ~ Bharat Sir's Student**

*There are no direct instructions for these operations.*

*AND followed by NOT is a NAND.*

*OR followed by NOT is a NOR.*

*XOR followed by NOT is a XNOR.*

**External Examiner**

When is CBW used?

Q: 45

**You ~ Bharat Sir's Student**

*To expand an 8-bit signed number into 16 bits by retaining its MSB.*

**External Examiner**

Can the binary number (1000 0011) can have two values?

Q: 46

**You ~ Bharat Sir's Student**

*Yes. Depending upon whether we are working in signed or unsigned system. Unsigned: 83H. Signed: -7DH.*

**Bharat Sir ~ For Doubts Call Me @ 9820408217**

*Excellent answer... Most students get this one wrong!*

*Keep it up!*



**External Examiner**

Difference between Control Flags and Status Flags?

Q: 47

**You ~ Bharat Sir's Student**

*Status flags give status of Current result and are changed by the ALU.*

*Control flags are changed by the programmer & are used to control different operations.*

**External Examiner**

Perform  $(-25H) + (-35H)$ . Show effect on Flags?

Q: 48

**You ~ Bharat Sir's Student**

*Answer: -5AH. Flags: OF = 0, SF = 1, ZF = 0, AC = 1, PF = 1, CF = 1.*

*In case of doubts please refer #BharatSir classroom examples.*

*All this is much easier than you think and wildly interesting.*

*Stop mugging up and wasting your chance to learn a beautiful subject...*

*Start Learning... right now!*

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)

**External Examiner**

What is the use of Control Flags?

Q: 49

**You ~ Bharat Sir's Student**

*DF: Decides Direction for String Operations (0- decrement, 1-increment)*

*IF: Enables or Disables INTR interrupt (0 – disable, 1 - enable)*

*TF: Perform single stepping (1- perform, 0 – don't perform)*

**External Examiner**

Why does IF affect only INTR interrupt?

Q: 50

**You ~ Bharat Sir's Student**

*There are 256 interrupts. We can't disable software interrupts.  
We can't disable NMI. That leaves only INTR interrupt.*



**External Examiner**

What are Vectored and Non Vectored interrupts?

Q: 51

**You ~ Bharat Sir's Student**

*Interrupts that have a Fixed Vector Number are called Vectored.*

*All Software interrupts and NMI are Vectored.*

*An interrupt whose Vector Number is Not Fixed is called Non-Vectored.*

*INTR is the only Non Vectored Interrupt of 8086.*

**Crash Course – In your pocket**

**Learn the full subject at:**

**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**

**External Examiner**

Why does 8086 give INTA#?

Q: 52

**You ~ Bharat Sir's Student**

*INTA# is given in response to INTR to obtain the Vector Number as INTR is Non Vectored. 8086 gives two INTA#. On first INTA# device generates the value of Vector Number. On 2<sup>nd</sup> INTA# device sends the value of Vector Number to 8086.*

*All this is much easier than you think and wildly interesting.*

*Stop mugging up and wasting your chance to learn a beautiful subject... Start Learning... right now!*

**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**



**External Examiner**

What are INT 0... INT 4 called?

Q: 53

**You ~ Bharat Sir's Student**

*These are called Dedicated Interrupts as their functions are dedicated.*

*INT 0: Divide Error.*

*INT 1: Single Stepping.*

*INT 2: NMI.*

*INT 3: Breakpoint.*

*INT 4: Interrupt on Overflow.*

**External Examiner**

What are INT 5... INT 31 called?

Q: 54

**You ~ Bharat Sir's Student**

*These are called Reserved Interrupts.*

*They are reserved by Intel, for Future Processors.*

**External Examiner**

What are INT 32... INT 255 called?

Q: 55

**You ~ Bharat Sir's Student**

*These are called User Defined Interrupts.*

*They are available to the programmer and can be used to service any user-defined condition.*

**External Examiner**

Define an interrupt?

Q: 56

**You ~ Bharat Sir's Student**

*An interrupt is a condition that can make the microprocessor execute an ISR*

**External Examiner**

What are Assembler Directives?

Q: 57

**You ~ Bharat Sir's Student**

*These are statements given to the assembler so that it can convert the program into machine language. They are not instructions so they don't have any opcode.*



**External Examiner**

What .ASM file?

Q: 58

**You ~ Bharat Sir's Student**

*It is an Assembly language file*

*The Assembler converts into .OBJ file, which is in machine language.*

*The Linker converts it into a .EXE file that can be executed..*

**External Examiner**

What is the use of DB, DW, DD, DQ, DT directives?

Q: 59

**You ~ Bharat Sir's Student**

*These are data types used for declaring variables.*

*DB: 8-bit. DW: 16-bit. DD: 32-bit. DQ: 64-bit. DT: 80-bits.*

**External Examiner**

What is the use of Assume Directive?

Q: 60

**You ~ Bharat Sir's Student**

*Informs the Assembler, which are the segments. E.g.: Assume CS: Code, DS: Data.*

**Sponsored ①**

Visit: [www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com) to learn the full subject

Your Crash course in your pocket

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)

**External Examiner**

What is the use of .model Small directive?

Q: 61

**You ~ Bharat Sir's Student**

*It reduces the memory consumed by our program by allowing the Assembler to overlap the segments instead of reserving 64 KB space for every segment.*

**External Examiner**

What is the use of .stack 100 directives?

Q: 62

**You ~ Bharat Sir's Student**

*Allocates 100 bytes to stack. Can be increased if needed.*



**External Examiner**

What is the use of INT 21H?

Q: 63

**You ~ Bharat Sir's Student**

*It is a DOS Interrupt. It performs several functions depending upon the value in AH.*

**To Accept a Value from User**

**MOV AH, 01H**

*INT 21H; user given value comes in AL.*

**To Accept a String from User**

**LEA DX, String**

**MOV AH, 0AH**

*INT 21H; user given string stored at location pointed by DX.*

**To Display a the result on Screen**

**MOV DL, value**

**MOV AH, 02H**

*INT 21H; value in DL will be displayed*

**To Display a message on Screen**

**Msg DB 'Hello World' --- do this in data segment**

**LEA DX, Msg**

**MOV AH, 09H**

*INT 21H; "Hello World" will be displayed on the screen.*

**To Terminate the Program**

**MOV AH, 4CH**

*INT 21H; Termination Code.*

*All this is much easier than you think and wildly interesting.*

*Stop mugging up and wasting your chance to learn a beautiful subject...*

*Start Learning... right now!*

**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**



**External Examiner**

What is the use 13, 10, (or 0DH, 0AH) while declaring a string?

Q: 64

**You ~ Bharat Sir's Student**

*It is the ASCII for Carriage Return, Line Feed.*

*This simply means the string will be displayed on a new line, from the left most position.*

*This is the same as putting "\n" in C Programming.*

**External Examiner**

Why do we put a \$ at the end of a string?

Q: 65

**You ~ Bharat Sir's Student**

*For the Assembler to understand that the string has ended.*

**External Examiner**

Why do we write, "Start" at the beginning?

Q: 66

**You ~ Bharat Sir's Student**

*This indicates the beginning of the first executable statement in the program. Its like "main" of a C program.*

**External Examiner**

Why do we write, "Org" assembler directive?

Q: 67

**You ~ Bharat Sir's Student**

*Org stands for Origin.*

*It gives the absolute location where the data (following Org) will be stored.*

**Microprocessors Crash Course – Bharat Sir**

**www.BharatAcharyaEducation.com**



**External Examiner**

What is 8282? Where is it used?

Q: 68

**Bharat Sir's Student**

*It is an 8-bit latch. It is used to latch the address from the multiplexed address – data bus. It captures address when ALE is 1.*

**External Examiner**

What is 8286? Where is it used?

Q: 69

**Bharat Sir's Student**

*It is an 8-bit data trans-receiver. It is a bi-directional buffer. It passes data. It is enabled by DEN# (DEN bar) and its direction is decided by DT/R# signal.*

**External Examiner**

What is 8284? Where is it used?

Q: 70

**Bharat Sir's Student**

*It is a clock generator. It is used to generate the system clock.*

*It is connected to a crystal oscillator.*

*The Crystal frequency is divided by 3, to produce a clock of 33 % duty cycle.  
If 8086 operates at 6 MHz we connect a crystal of 18 MHz  
8284 also synchronizes Reset and Ready for the entire system.*

**External Examiner**

What is 8288? Where is it used?

Q: 71

**Bharat Sir's Student**

*It is a Bus Controller. It is used to generate control signals in Max Mode.  
It decodes S2#, S1#, S0# and generates all the control signals.*

**External Examiner**

How do you Generate Control Signals in Min Mode?

Q: 72

**You ~ Bharat Sir's Student**

*In Min Mode, 8086 Produces M/IO#, RD# and WR#. They Are decoded by a 3:8 decoder to produce MEMR#, MEMW#, IOR# and IOW#.*



**External Examiner**

What is the difference between Min Mode and Max Mode?

Q: 73

**You ~ Bharat Sir's Student**

*In Min Mode, there is only one processor that is 8086.*

*In Max Mode 8086 can work along-with other processors like 8087 and 8089.  
8087 is called NDP (Numeric data processor), also called Math Co Processor.  
8089 is called I/O Processor.*

**External Examiner**

What is 8288? Where is it used?

Q: 74

**You**

*It is a Bus Controller. It is used to generate control signals in Max Mode.  
It decodes S2#, S1#, S0# and generates all the control signals.*

**External Examiner**

What is a Machine Cycle/ Bus Cycle? Example?

Q: 75

**You**

*One operation performed on the system bus is called a Machine Cycle.  
Example: Memory Read, Memory Write etc.*

*In 8086 every Machine cycle requires 4 t-states.*

**External Examiner**

In a Read Machine cycle, why is there a time gap between Address and Data?

Q: 76

**You**

*It a Read Cycle, Data has to travel from Memory (or I/O) to the Microprocessor. This travel takes time. It is called propagation delay.  
It is not required in a Write Cycle as data is sent by the microprocessor itself.*

**External Examiner**

Why are Read or Write signals activated in T2?

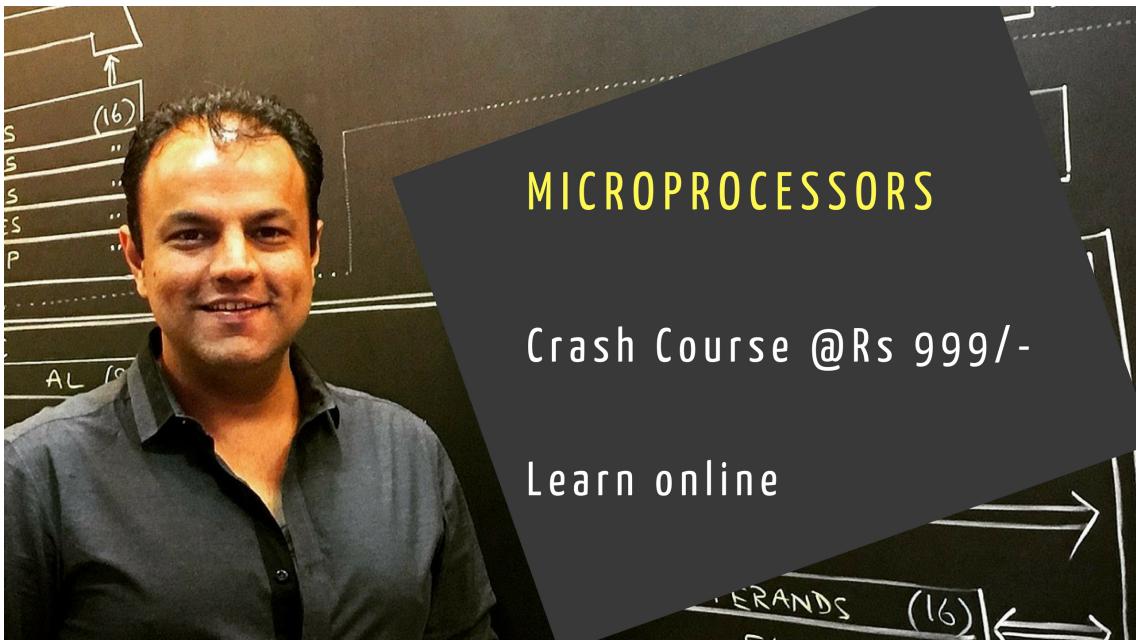
Q: 77

**You ~ Bharat Sir's Student**

*Because in T1, the multiplexed bus carries address.*



## Your Crash course in your pocket



**MICROPROCESSORS**

Crash Course @Rs 999/-

Learn online

The diagram on the chalkboard includes labels like 'AL', '(16)', 'REGISTER', 'DATA BUS', 'ADDRESS BUS', and 'CONTROL BUS'.

[\*\*www.BharatAcharyaEducation.com\*\*](http://www.BharatAcharyaEducation.com)



**External Examiner**

Instruction Cycles are Interrupt Breakpoints,  
Machine Cycles are DMA Breakpoints. Justify?

Q: 78

**You ~ Bharat Sir's Student**

*When an Interrupt occurs microprocessor finishes the current instruction before executing the ISR. In case of doubts call #BharatSir on: 982040 08217.*

*When a Bus Request (DMA) occurs, microprocessor simply finishes the current machine cycle and releases the bus.*

**External Examiner**

Why does 8086 have two GND pins?

Q: 79

**You ~ Bharat Sir's Student**

*GND is the pin from where all the Current is drained out of the chip.  
In order to avoid over-heating on a single ground pin, 8086 has 2 GNDs.*

**External Examiner**

If RESET, HOLD, NMI and INTR occur simultaneously,  
what is their priority order of service?

Q: 80

**You ~ Bharat Sir's Student**

*The strongest signal of microprocessor is RESET, and will be serviced first.  
Then Bus Request Signals (Hold or RG#/GT#). Then NMI and Finally INTR.*

**External Examiner**

When does 8086 check Ready Signal?

Q: 81

**You ~ Bharat Sir's Student**

*Ready is checked during T3 of any machine cycle.*

*If it is "0", it means device is not ready. Refer #BharatSir lecture notes for more!  
"Wait States" are inserted between T3 and T4 till Ready becomes "1"*

**External Examiner**

What are Advanced Write signals?

Q: 82

**You ~ Bharat Sir's Student**

*They get activated 1 T-state in advance. It gives slower devices more time to accept the data. Please refer #BharatSir printed notes for more on this!*



**External Examiner**

What is the use of 8087 NDP?

Q: 83

**You ~ Bharat Sir's Student**

*It is used to perform powerful arithmetic like Trigonometry, Log, Square-Root etc. It operates on Floating Point numbers up to 80 bits. It can perform multiprocessing with 8086 to give higher performance.*

**External Examiner**

What are the data formats of 8087?

Q: 84

**You ~ Bharat Sir's Student**

*Integers: Words Int (16). Short Int (32). Long Int (64 bits).*

*BCD: Packed BCD (80bits).*

*Floating Point: Short Real (32). Long Real (64). Temp Real (80) bits.*

*Draw Floating Point formats from Class Notes.*

**External Examiner**

How does 8087 know if host is 8086 or 8088?

Q: 85

**You ~ Bharat Sir's Student**

*By checking BHE# pin on reset. If it is 0, then it is 8086 else 8088.*

**External Examiner**

What is Normalization of a Floating Point No?

Q: 86

**You ~ Bharat Sir's Student**

*Normalization means converting a Floating Pt Number to Fixed Point.*

**External Examiner**

What are the errors/ exceptions of 8087?

Q: 87

**You ~ Bharat Sir's Student**

*8087 interrupts 8086 due to 6 different errors/ exceptions.*

*Precision: Mantissa is too large to be stored*

*Underflow: Exponent is too small to be stored*

*Overflow: Exponent is too large to be stored.*

*Zero Divide: When we divide by zero*

*De-Normal Operand: When operand is not normalized*

*Invalid Operation: When we perform an invalid operation*



**External Examiner**

What are the types of multi processor systems?

Q: 88

**You ~ Bharat Sir's Student**

*Closely Coupled: Multiple Processors use the same, SHARED Memory, I/O & Buses.*

*Loosely Coupled: Multiple Processors use their own LOCAL Memory, I/O & Buses, and are connected to each other by a SHARED bus.*

**External Examiner**

What is the Role of 8289 Bus Arbiter?

Q: 89

**You ~ Bharat Sir's Student**

*8289 is used in Loosely Coupled systems to resolve priorities when different modules request for the SHARED system bus.*

**External Examiner**

What are different Arbitration Schemes?

Q: 90

**You ~ Bharat Sir's Student**

*Daisy Chaining, Polling and Independent Requests.*

**External Examiner**

What are the instruction prefixes used in 8086?

Q: 91

**Bharat Sir's Student**

*REP: Used to repeat string instructions "CX" times.*

*LOCK: Prevents the microprocessor from releasing the bus during an instruction.*

*ESC: Used to identify an 8087 instruction. (ESC is "11011" in binary)*

**External Examiner**

What is the role of WAIT instruction in 8086?

Q: 92

**You ~ Bharat Sir's Student**

*WAIT makes 8086 check TEST# signal.*

*TEST# comes from BUSY signal of 8087. If 8087 is BUSY, TEST# will be "1". Now 8086 enters Wait State, and will resume after TEST# becomes "0".*

**Bharat Sir ~ Winter is coming.**

Well done... Keep it up!



**External Examiner**

What is the role of 8259 PIC?

Q: 93

**You ~ Bharat Sir's Student**

*It is used to increase the number of interrupts.*

*8259 has 8 interrupt pins IR0 – IR7.*

*If cascaded, 8259 can provide up to 64 interrupts using 1 master and 8 slaves.*

**Your Crash course in your pocket**

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)



**External Examiner**

What are the priority modes of 8259?

Q: 94

**Bharat Sir's Student**

*FNM: Default mode. IR0 Highest... IR7 Lowest. Used in Single 8259.*

*SFNM: IR0 Highest... IR7 Lowest. Used in Cascaded 8259.*

*Rotating Priority: After any interrupt is serviced it becomes lowest priority.*

**External Examiner**

What is SMM in 8259?

Q: 95

**Bharat Sir's Student**

*Any interrupt can interrupt the current ISR, irrespective of their priority, except the interrupt currently being serviced.*

**External Examiner**

What are EOI modes in 8259?

Q: 96

**Bharat Sir's Student**

*Normal EOI Mode: Programmer gives EOI command at the end of ISR to clear bit from in service register.*

*Auto EOI Mode: 8259 automatically clears bit from in service register after 2<sup>nd</sup> INTA# cycle.*

**External Examiner**

What is the use of CAS lines in 8259?

Q: 97

**Bharat Sir's Student**

*CAS<sub>0,1,2</sub> are used by the master to select the slave during 1<sup>st</sup> INTA#.*

**External Examiner**

What is Polling in 8259?

Q: 98

**Bharat Sir's Student**

*In Poll Mode, instead of 8259 interrupting the microprocessor, 8086 will periodically POLL 8259 to know which interrupt has occurred.*



**External Examiner**

What are the Commands of 8259?

Q: 99

**Bharat Sir's Student**

*There are two types of Commands:*

*ICW1, ICW2, ICW3 and ICW4: Initialization Command Words.*

*OCW1, OCW2 and OCW3: Operational Command Words.*

*These are commands given by the programmer to 8259 to program various properties such as Vector Numbers, Triggering, Masking, Priority etc.*



*All this is much easier than you think and wildly interesting.  
Stop mugging up and wasting your chance to learn a beautiful subject...  
Start Learning... right now!*  
[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)



**External Examiner**

What is the Role of 8255 PPI?

Q: 100

**Bharat Sir's Student**

*8255 provides 3, 8-bit bidirectional I/O ports for connection I/O devices to 8086. It can perform Handshake based data transfer to increase reliability.*

**External Examiner**

What is data transfer Modes of 8255?

Q: 101

**Bharat Sir's Student**

*Mode 0: Simple I/O. All ports transfer data but no handshaking.*

*Mode 1: Handshake I/O. Port A, B transfer data, Port C does Handshaking.*

*Mode 2: Bidirectional Handshaking. Only Available for Port A.*

**External Examiner**

What are the Commands of 8255 PPI?

Q: 102

**Bharat Sir's Student**

*I/O Command: Used to select the Modes and Directions of all ports of 8255.*

*BSR Command; Used to set or reset a single line of Port C.*

**External Examiner**

How can we generate a square wave using 8255?

Q: 103

**Bharat Sir's Student**

*Using BSR Command, we can make any line of port C alternate between 1 and 0 (Set and Reset) with a delay after each. Connect this output to a CRO and we get a square wave. By manipulating delay we can also produce Rectangular wave.*

**Bharat Sir**

Superb answer! Say the same thing if asked to blink an LED.

Keep it up!



**External Examiner**

What is the role of 8253/8254 PIT?

Q: 104

**Bharat Sir's Student**

*It is used to produce hardware delays using three 16-bit Counters: C0, C1 & C2.*

**External Examiner**

What are the 6 Counting Modes of 8254 PIT?

Q: 105

**You ~ Bharat Sir's Student**

*Mode 0: Interrupt on Terminal Count*

*Mode 1: Mono-stable Multi-vibrator*

*Mode 2: Rate Generator*

*Mode 3: Square Wave Generator*

*Mode 4: Software Triggered Strobe*

*Mode 5: Hardware Triggered Strobe*

**External Examiner**

What are the methods of reading the count?

Q: 106

**Bharat Sir's Student**

*Ordinary Read: Counting has to be stopped.*

*Counter Latch Command: Can read the Count without stopping.*

*Read Back Command: Can read Count and Status without stopping.*

**External Examiner**

What is the difference between 8253 & 8254?

Q: 107

**Bharat Sir's Student**

*8253 does not have a Read Back Command*

**External Examiner**

What if we give an ODD count for Mode 3 Sq. Wave Gen?

Q: 108

**You ~ Bharat Sir's Student**

*The Extra pulse is always given on the HIGH side.*

*Count = 6: 3-High, 3-Low pulses. Count = 7: 4-High, 3-Low pulses*

**Bharat Sir**

That was a tricky one... Well Done!

Call: 9820408217



**External Examiner**

What is DMA?

Q: 109

**You ~ Bharat Sir's Student**

*Direct Memory Access means transferring data directly between Memory and I/O without involving the microprocessor. It is extremely fast due to two reasons: The transfer is direct and it is hardware based so no time is wasted in fetching and decoding instructions.*

*All this is much easier than you think and wildly interesting.*

*Stop mugging up and wasting your chance to learn a beautiful subject...*

*Start Learning... right now!*

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)

**External Examiner**

Explain DMA operation in brief?

Q: 110

**You ~ Bharat Sir's Student**

*DMA Controller (8237/8275) makes Hold = 1. 8086 Releases system bus and makes HLDA = 1. DMAC becomes bus master and transfers data directly between Memory and I/O. At the end DMAC makes Hold = 0. 8086 becomes bus master again.*

**External Examiner**

What are DMA Data Transfer Modes?

Q: 111

**You ~ Bharat Sir's Student**

*Block transfer also called Burst Mode: DMAC performs full data transfer and only then return the bus back to 8086.*

*Cycle Stealing also called Single Byte transfer: Both 8086 and DMAC perform Single Cycles alternately.*

*Demand transfer: Transfer stops whenever DREQ becomes low, and resumes when DREQ becomes high again (transfer happens only on demand)*

*Transparent Mode also called Hidden Mode: Transfer done only when 8086 is idle.*



**External Examiner**

What is Cascaded mode of DMA?

Q: 112

**You ~ Bharat Sir's Student**

*DMAC has 4 Channels.*

*If we want more devices then we can connect DMAC in a cascaded form.*

**External Examiner**

What is DMA Read and DMA Write Cycle?

Q: 113

**You ~ Bharat Sir's Student**

*DMA Read: When DMAC transfers data from Memory to I/O.*

*DMA Write: When DMAC transfers data from I/O to Memory.*

**External Examiner**

Explain DMAC Priority Modes?

Q: 114

**You ~ Bharat Sir's Student**

*Fixed Priority: Channel 0 Highest... Channel 3 Lowest.*

*Rotating Priority: When a channel is serviced it gets lowest priority and others come up in the order in a circular manner.*

**Your Crash course in your pocket**  
**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**



**External Examiner**

Give some features of 80586 - Pentium?

Q: 116

**You ~ Bharat Sir's Student**

*Operating frequency: 66 - 99 MHz*

*Address Bus: 32 bits, Physical Memory: 4GB*

*Data Bus: 64 bits , Memory Banks: 8 banks*

*ALU: 32 bits, Classification: 32-bit microprocessor*

*Pipeline Stages: 5 stages – Fetch, Decode, Operand Addr Calc, Exec, Write Back*

**External Examiner**

What are the different types of Non – Volatile Memories?

Q: 117

**You ~ Bharat Sir's Student**

**ROM:** Read Only Memory. This is the original type of ROM. Cannot be written.

**PROM:** Programmable ROM. Can be written but only once. Also called OTPROM.

**EPROM:** Erasable PROM. Can be erased by exposure to UV rays.

**EEPROM:** Electrically EPROM. Can be erased by applying higher voltage.

**Flash ROM.** Special type of EEPROM. Allows block-wise erasure so erasure is faster.

**External Examiner**

What are the different types of Volatile Memories?

Q: 118

**You ~ Bharat Sir's Student**

**RAM:** Random Access Memory. It is of two types.

**SRAM:** Static RAM. Uses Flip-Flops to store data so works faster. Very Expensive.

**DRAM:** Dynamic RAM. Uses capacitors to store data. Slower. Cheaper.

**SDRAM:** Synchronous Dynamic RAM. Uses common clock with CPU to synchronize.

**RDRAM:** Rambus RAM. Uses dedicated bus with CPU to transfer data..

<http://www.BharatAcharyaEducation.com>



**External Examiner**

What memories are used in your mobile phone?

Q: 119

**You ~ Bharat Sir's Student**

*It uses DRAM for primary memory, and Flash for secondary storage. Even the memory card is Flash ROM.*

**External Examiner**

What memories are used in your computer?

Q: 120

**You ~ Bharat Sir's Student**

*Primary Memory: DRAM ~ 4GB*

*Secondary Memory: Hard Disk ~ 1TB*

*Cache Memory: SRAM ~ 3MB*

*Portable Memory: CD – 700MB, DVD – 4.7GB. Pen Drives: Flash ROM of any size.*

**Micropocessors Crash Course – Bharat Sir**

Learn the full subject online:

[www.bharatacharyaeducation.com](http://www.bharatacharyaeducation.com)

Subscribe once, unlimited views for 6 months  
Paytm, Credit Cards, Debit Cards, NetBanking...

New Videos added daily!

Subscribe NOW...

[www.bharatacharyaeducation.com](http://www.bharatacharyaeducation.com)



Subscribe NOW...

[www.bharatacharyaeducation.com](http://www.bharatacharyaeducation.com)

**MICROPROCESSORS**

Crash Course @Rs 999/-

Learn online

ERANDS (16)



## 80386 Based Questions

### **External Examiner**

What are the basic features of 80386?

Q: 121

### **You ~ Bharat Sir's Student**

*Address bus: 32 bits. Therefore total physical memory =  $2^{32} = 4GB$ .*

*ALU: 32 bits. Hence called 32 bit  $\mu P$ .*

*Data bus: 32 bits hence 4 memory banks.*

*Operating frequency: 16MHz – 33 MHz*

### **External Examiner**

Difference between SX and DX version of 80386?

Q: 122

### **You ~ Bharat Sir's Student**

*SX: Single execution speed... 32 bit ALU but 16 bit data bus.*

*DX: Double execution speed... 32 bit ALU and 32 bit data bus.*

### **External Examiner**

What are the new flags added by 80386?

Q: 123

### **You ~ Bharat Sir's Student**

*VM: to enter Virtual 8086 mode*

*RF: Resume flag for debug breakpoints*

*NT: Nested task for multitasking environment*

*IOPL: Decides privilege level for I/O Devices*

*All this is much easier than you think and wildly interesting.*

*Stop mugging up and wasting your chance to learn a beautiful subject...*

*Start Learning... right now!*

**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**



**External Examiner**

Describe pipelining of 80386?

Q: 124

**You ~ Bharat Sir's Student**

*3 - Stage pipeline.*

*Fetch, Decode and Execute.*

**External Examiner**

What is the size of Virtual memory of 80386?

Q: 125

**You ~ Bharat Sir's Student**

*Virtual address is 46 bits (14 bit selector and 32 bit offset)*

*This gives  $2^{46} = 64TB$  of Virtual address space.*

**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**



**External Examiner**

What are the steps in address translation?

Q: 126

**You ~ Bharat Sir's Student**

*46 bit Virtual address is converted into 32 bit linear address by segmentation.*

*This is further converted into 32 bit physical address by paging.*

*Segmentation is compulsory, Paging is optional.*

*If paging is not performed then the linear address is the physical address.*



### **External Examiner**

What is GDTR, LDTR, IDTR and TR?

Q: 127

#### **You ~ Bharat Sir's Student**

*GDTR: Global Descriptor table register.  
Gives base address of GDT.*

*LDTR: Local Descriptor table register.  
Gives a selector to the LDT descriptor in GDT.*

*IDTR: Interrupt Descriptor table register.  
Gives base address of IDT.*

*TR: Task register.  
Gives a selector to the TSS descriptor in GDT.*

*All this is much easier than you think and wildly interesting.  
Stop mugging up and wasting your chance to learn a beautiful subject...  
Start Learning... right now!*

**[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)**

### **External Examiner**

What are the operating modes of 80386?

Q: 128

#### **You ~ Bharat Sir's Student**

**Real mode:** Works like a fast 8086. Selected on reset.

**Protected mode:** all new features of 386 are active in protected mode like protection mechanism, multitasking, advanced address translation and paging.

**Virtual 8086 mode:** To invoke in a virtual 8086 environment once we have switched to protected mode.



**External Examiner**

What are the sizes of the following?

Q: 129

**You ~ Bharat Sir's Student**

*GDT: 64KB*

*LDT: 64 KB*

*IDT: 2KB*

*GDTR: 48 bit*

*LDTR: 16 bit*

*IDTR: 48 bit*

*TR: 16 bit*

*Segment registers: 16 bit*

*Offset registers: 32 bit*

*Virtual address: 46 bit*

*Linear address: 32 bit*

*Physical address: 32 bit*

*Page table: 4KB*

*Page Directory: 4KB*

*Page: 4KB*

*EFLAGS: 32 bits*

*Control registers: 32 bits*

*GPRs: 32 bit*

*All of this is applicable to protected mode.*

*This is much easier than you think and wildly interesting.*

*Stop mugging up and wasting your chance to learn a beautiful subject...*

*Start Learning... right now!*

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)



Subscribe NOW...

[www.bharatacharyaeducation.com](http://www.bharatacharyaeducation.com)

The image shows a man with dark hair and a beard, wearing a grey button-down shirt, standing in front of a chalkboard. The chalkboard has various handwritten notes, including 'S', 'P', 'AL 19', 'ERANDS', and '(16)'. A large, semi-transparent dark grey triangle is overlaid on the right side of the image. Inside this triangle, the word 'MICROPROCESSORS' is written in yellow capital letters. Below it, the text 'Crash Course @Rs 999/-' is displayed in white. At the bottom of the triangle, the words 'Learn online' are written in white. Arrows point from the text towards the corresponding chalkboard content.

**MICROPROCESSORS**

Crash Course @Rs 999/-

Learn online



## Pentium Based Questions

### **External Examiner**

Give basic features of Pentium?

Q: 130

### **You ~ Bharat Sir's Student**

*Address bus: 32 bits. Therefore total physical memory =  $2^{32} = 4GB$ .*

*ALU: 32 bits. Hence called 32 bit  $\mu$ P.*

*Data bus: 64 bits hence 8 memory banks.*

*Operating frequency: 66MHz – 100 MHz (Various versions were released)*

### **External Examiner**

What is the architecture of Pentium called?

Q: 131

### **You ~ Bharat Sir's Student**

*P5 Microarchitecture.*

*Several initial versions of Pentium were based on this microarchitecture.*

### **External Examiner**

What are the integer pipeline stages of Pentium?

Q: 132

### **You ~ Bharat Sir's Student**

*5 stage, 2 way superscalar*

*Prefetch, Decode1, Decode2, Execute, Write back.*

*The two pipes are called u and v pipes.*

*This is much easier than you think and wildly interesting.*

*Stop mugging up and wasting your chance to learn a beautiful subject...*

*Start Learning... right now!*

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)



**External Examiner**

What are the floating point pipeline stages of Pentium?

Q: 133

**You ~ Bharat Sir's Student**

*8 stage FP Pipeline*

*Prefetch, Decode1, Decode2, Execute, FPExec1, FPExec2, Write back, Error reporting.*

**External Examiner**

What is the size of instruction queue?

Q: 134

**You ~ Bharat Sir's Student**

*2 queues of 32 bytes each*

**External Examiner**

What is the size of cache?

Q: 135

**You ~ Bharat Sir's Student**

*Pentium has on-chip L1 Split cache.*

*8 KB on-chip L1 code cache.*

*8 KB on-chip L1 data cache.*

*Both are 2 way set associative.*

*If these words don't make any sense to you, that's only because you haven't tried understanding these concepts.*

*µP can be the toughest subject if you try to mug it up.*

*On the other hand, once you understand things you will be amazed at the vast depth of concepts this subject teaches you, and then of course all these answers just keep flowing out easily.*

*Don't waste your chance of learning the best that engineering has to offer!  
Start learning... NOW!*

[www.BharatAcharyaEducation.com](http://www.BharatAcharyaEducation.com)



Subscribe NOW...

[www.bharatacharyaeduation.com](http://www.bharatacharyaeduation.com)

**MICROPROCESSORS**

Crash Course @Rs 999/-

Learn online