

**Q1. Define Stack Data Structure? 2 marks**

**Answer:- (Page 67)**

Stack is a data structure that behaves in a first in last out manner. It can contain many elements and there is only one way in and out of the container. When an element is inserted it sits on top of all other elements and when an element is removed the one sitting at top of all others is removed first

**Q2. How many broad categories video services are classified? 2 marks**

**Answer:- (Page 149)**

Video services are classified into two broad categories; graphics mode services and text mode services.

**Q3. What is programmer view of processor? 2 marks**

**Answer:- (Page 32)**

The processor will blindly go there, where we mention even if it contains data and not code

**Q4. INT-14-Serial-READ CHARACTER FORM PORT uses which two 8-bit registers to return to result? 2 marks**

**Answer:- (Page 172)**

Return:

AH = line status

AL = received character if AH bit 7 clear

**Q5. Difference between two instructions? 3 Marks**

**mov byte [num1],5**

**mov word [num1],5**

**Answer:-**

In first instruction, The variable num1 is treated as a byte and similarly 5 is also treated as byte.

In 2nd instruction, The variable num1 is treated as a word and similarly 5 is also treated as word.

**Q6. Write two different modes of video services of BIOS? Differentiate between both modes? 3 Marks**

**Answer:- (Page 149)**

Video services are classified into two broad categories; graphics mode services and text mode services. In graphics mode a location in video memory corresponds to a dot on the screen. In text mode this relation is not straightforward. The video memory holds the ASCII of the character to be shown and the actual shape is read from a font definition stored elsewhere in memory

**Q7. Define Triple Fault? 3 Marks**

**Q8. Difference between roles of segment-selector and segment-descriptor? 3 Marks**

**Answer:- (Page 175)**

Role of selector is to select on descriptor from the table of descriptors and the role of descriptor is to define the actual base address.

**Q9. How value of Stack pointer (SP) changes after every PUSH or POP instructions? 5 Marks**

**Answer:- (Page 68)**

Whenever an element is pushed on the stack SP is decremented by two and when we pop from it, it increments by 2 as in case of decrementing stack. A decrementing stack moves from higher addresses to lower addresses as elements are added in it

**Q10. How to write disk sector using INT 13 service? 5 Marks**

**Answer:- (Page 156)**

INT 13 - DISK - WRITE DISK SECTOR(S)

AH = 03h

AL = number of sectors to write (must be nonzero)

CH = low eight bits of cylinder number

CL = sector number 1-63 (bits 0-5)

high two bits of cylinder (bits 6-7, hard disk only)

DH = head number

DL = drive number (bit 7 set for hard disk)

ES:BX -> data buffer

Return:

CF = error flag

AH = error code

AL = number of sectors transferred

**Q11. Write down instructions for data movement and arithmetic operations in Motorola 68K Processor? 5 Marks**

**Answer:- (Page 191)**

Data Movement

EXG D0, D2

MOVE.B (A1), (A2)

MOVEA (2222).L, A4

MOVEQ #12, D7

Arithmetic

ADD D7, (A4)

CLR (A3) (set to zero)

CMP (A2), D1

ASL, ASR, LSL, LSR, ROR, ROL, ROXL, ROXR (shift operations)

**Q12. How to load program using INT21 service?      5 Marks**

**Answer:- (Page 165)**

INT 21 - LOAD AND/OR EXECUTE PROGRAM

AH = 4Bh

AL = type of load (0 = load and execute)

DS:DX -> ASCIZ program name (must include extension)

ES:BX -> parameter block

Return:

CF = error flag

AX = error code

**Difference between serial and parallel communication.**

**Answer:- (Page 171)**

Serial port is a way of communication among two devices just like the parallel port. The basic difference is that whole bytes are sent from one place to another in case of parallel port while the bits are sent one by one on the serial port in a specially formatted fashion.

**Write brief about INT 13 – Extended READ SERVICES**

**Answer:- (Page 157)**

**INT 13 - INT 13 Extensions - EXTENDED READ**

AH = 42h

DL = drive number

DS:SI -> disk address packet

Return:

CF = error flag

AH = error code

**Describe briefly INT 3 functionality.**

**Answer:- (Page 133)**

INT 3 is a Debug Interrupt. INT 3 has a single byte opcode so it can replace any instruction. This allows it to replace any instruction whatsoever. This is also called break point interrupt.

**How to create or Truncate File using INT 21 Service?**

**Answer:- (Page 161)**

**INT 21 - CREATE OR TRUNCATE FILE**

AH = 3Ch

CX = file attributes

DS:DX -> ASCIZ filename

Return:

CF = error flag

AX = file handle or error code

**Q1) define condition when ZF is set or clear? 2 marks**

**Answer:- (Page 41)**

When the source is subtracted from the destination and both are equal the result is zero and therefore the zero flag is set.

**Q2) types of User descriptor?**

**Q3) system descriptor?**

**Answer:- (Page 182)**

The S bit tells that this is a system descriptor

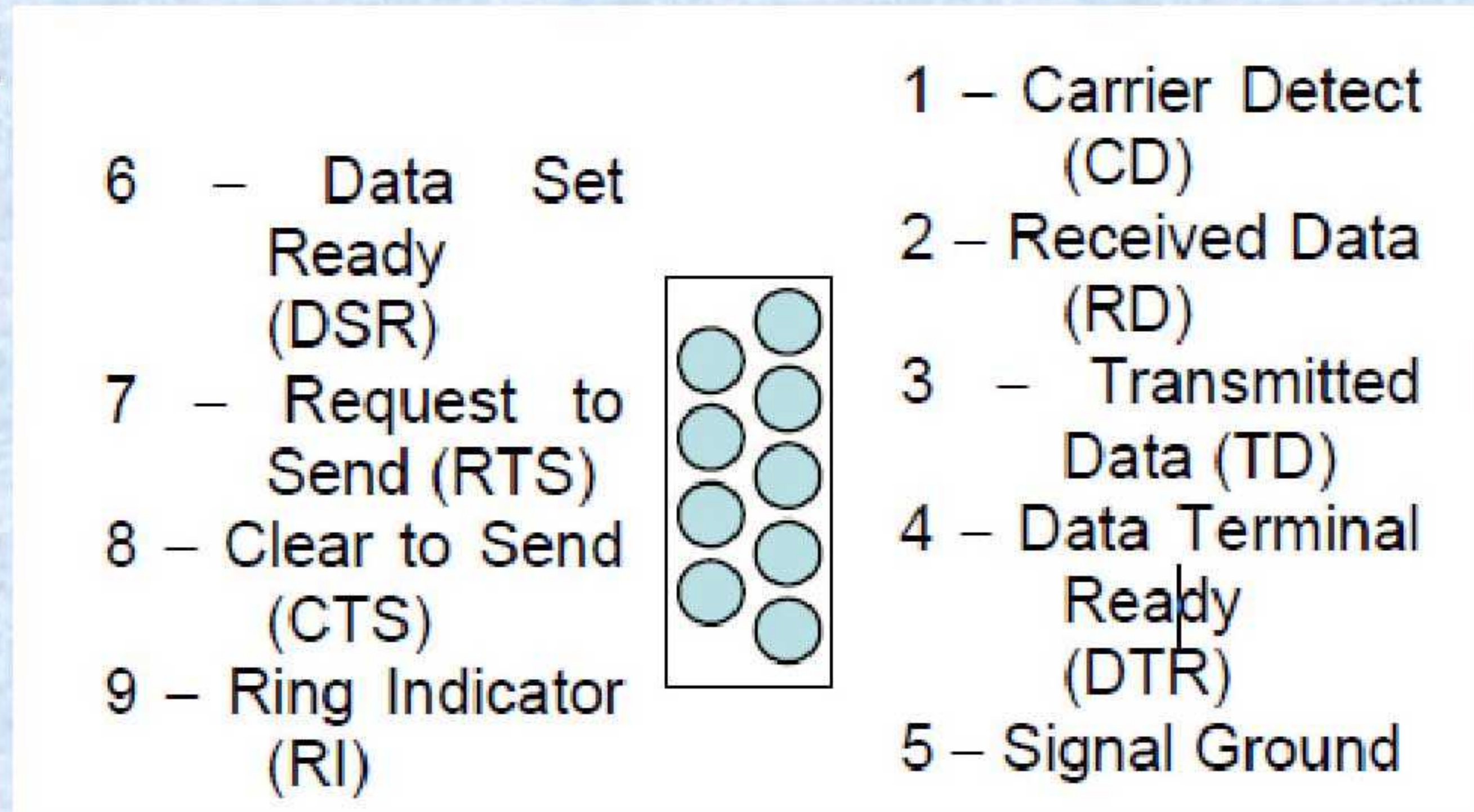
**Q4) define interrupt INT 0\*80**

**Answer:- (Page 145)**

int 0x80 ; multitasking kernel interrupt

**Q5) draw serial port connector? 5marks**

**Answer:- (Page 171)**



**Q6) define extended ADD with carry? 5 marks**

**Answer:- (Page 57)**

The instruction is ADC or “add with carry.” Normal addition has two operands and the second operand is added to the first operand. However ADC has three operands. The third implied operand is the carry flag. The ADC instruction is specifically placed for extending the capability of ADD. Numbers of any size can be added using a proper combination of ADD and ADC. ADC first adds the carry flag to AX and then adds BX to AX. Therefore the last carry is also included in the result.

**Q7) data movement? 5 marks**

**Answer:- (Page 13)**

These instructions are used to move data from one place to another. These places can be registers, memory, or even inside peripheral devices. Some examples are:

`mov ax, bx`

`lad 1234`

**Q- What is speed of multitasking?**

**Answer:- (Page 143)**

When new threads are added, there is an obvious slowdown in the speed of multitasking. To improve that, we can change the timer interrupt frequency. The following can be used to set to an approximately 1ms interval.

```
mov ax, 1100
out 0x40, al
mov al, ah
out 0x40, al
```

This makes the threads look faster. However the only real change is that the timer interrupt is now coming more frequently

**Q- What is the function of ES and DS in video mode?**

**Answer:- (Page 81)**

Both DS and ES can be used to access the video memory. However we commonly keep DS for accessing our data, and load ES with the segment of video memory.

**Q-Device drivers and its routine**

**Answer:- (Page 166)**

Device drivers are operating system extensions that become part of the operating system and extend its services to new devices.

**Q-INT 13 Read sector into memory**

**Answer:- (Page 156)**

INT 13 - DISK - READ SECTOR(S) INTO MEMORY

AH = 02h

AL = number of sectors to read (must be nonzero)

CH = low eight bits of cylinder number

CL = sector number 1-63 (bits 0-5)

high two bits of cylinder (bits 6-7, hard disk only)

DH = head number

DL = drive number (bit 7 set for hard disk)

ES:BX -> data buffer

Return:

CF = error flag

AH = error code

AL = number of sectors transferred

**Q-SCAS instruction? How it checks null string?**

**Answer:- (Page 92,95)**

SCAS compares a source byte or word in register AL or AX with the destination string element addressed by ES:DI and updates the flag. We use SCASB with REPNE and a zero in AL to find a zero byte in the string. In CX we load the maximum possible size, which are 64K bytes.

**Q-Function of 9 pin DB 9 Connectors?**

**Answer:- (Page 171)**

- 1 – Carrier Detect
- 2 – Received Data
- 3 – Transmitted
- 4 – Data Terminal Ready
- 5 – Signal Ground
- 6 – Data Set Ready
- 7 – Request to Send
- 8 – Clear to Send
- 9 – Ring Indicator

**Q-What flags are used in AND operation**

**Answer:-**

Affected Flag of AND are:  
CF, OF, PF, SF, ZF and AC.

**Q-What do you mean by calling conventions?**

**Answer:- (Page 187)**

To interface an assembly routine with a high level language program means to be able to call functions back and forth. And to be able to do so requires knowledge of certain behavior of the HLL when calling functions. This behavior of calling functions is called the calling conventions of the language. Two prevalent calling conventions are the C calling convention and the Pascal calling convention.

**Q No2: What are the services provided by INT 0x18? (Marks 2)**

**Q No3: Which register's used by "INT 21-CREATE OR TRUNCATE FILE" to read service number and file attributes? (Marks 2)**

**Answer:-**

AH = 3Ch

CX = file attributes

DS:DX -> ASCIZ filename

**Q No4: What do you mean by faulty instruction? (Marks 2)**

**Q No 5: Which instructions are to call a subroutine and to get back to the same point where the function was called? Explain these instruction with help of an Examples.(Marks 3)**

**Answer:- (Page 64)**

CALL is used to call a subroutine and to get back RET is used. CALL takes a label as argument and execution starts from that label, until the RET instruction is encountered and it takes execution back to the instruction following the CALL.

FOR EXAMPLE:

```
[org 0x0100]
```

```
jmp start
```

```
num: dw 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
```

```
sum: add dx, [num+bx]
```

```
add bx,2
```

```
cmp bx,40
```

```
jne sum
```

```
ret
```

```
start: mov dx,0
```

```
mov bx,0
```

```
call sum
```

```
mov ax,0x4c00
```

```
int 0x21
```

**Q No6: With reference to the multitasking program" TSR Caller" writes against each instruction what they do. (Marks 3)**

```
MOVE al, [chars+bx]
```

```
Move [es: 40], al
```

```
INC bx
```

**Answer:- (Page 146)**

**MOVE al, [chars+bx]**

It will read next character from the declared variable char.

**Move [es: 40], al**

Answer: It will print the data at the specified place

**INC bx**

Answer: It will increment the register bx by 1

**Q No7: Consider the function “int divide (int divided, int divisor)” declared in C, write the code to call this function from assembly language? (Marks 3)**

**Answer:- (Page 187)**

To call this function from assembly we have to write.

```
push dword [mydivisor]
push dword [mydividend]
call _divide
add esp, 8
; EAX holds the answer
```

**Q No 8: How many type of Granularity are there? (Marks 3)**

**Answer:- [click here for detail](#)**

In particular two types of granularity have been delineated aggregation and abstraction.

**Q No 9: Write an assembly language program that clears the computer screen? (marks 5)**

**Answer:- (Page 82)**

```
; clear the screen
[org 0x0100]
mov ax, 0xb800 ; load video base in ax
mov es, ax ; point es to video base
mov di, 0 ; point di to top left column
nextchar: mov word [es:di], 0x0720 ; clear next char on screen
add di, 2 ; move to next screen location
cmp di, 4000 ; has the whole screen cleared
jne nextchar ; if no clear next position
mov ax, 0x4c00 ; terminate program
int 0x21
```

**Q No 10: Write an assembly language program for drawing a line in graphic mode of video service? (Marks 5)**

**Answer:- (Page 152)**

```
; draw line in graphics mode
[org 0x0100]
mov ax, 0x000D ; set 320x200 graphics mode
int 0x10 ; bios video services
mov ax, 0x0C07 ; put pixel in white color
xor bx, bx ; page number 0
mov cx, 200 ; x position 200
mov dx, 200 ; y position 200
11: int 0x10 ; bios video services
dec dx ; decrease y position
loop 11 ; decrease x position and repeat
mov ah, 0 ; service 0 – get keystroke
int 0x16 ; bios keyboard services
mov ax, 0x0003 ; 80x25 text mode
int 0x10 ; bios video services
mov ax, 0x4c00 ; terminate program
int 0x21
```

**Q No 11: Write down the movement instruction for SUN SPARK processor? Provide at least two examples? (Marks 5)**

**Answer:- (Page 193)**

Data Movement  
LDSB [rn], rn (load signed byte)  
LDUW [rn], rn (load unsigned word)  
STH [rn], rn (store half word)

**Q No12: What are the different registers setting values required to initialize the serial port? (Marks 5)**

**Answer:- rep**

**Sun Spark Properties? 5**

**Answer:- (Page 192)**

SPARC stands for Scalable Processor Architecture. SPARC is a 64bit processor. Its byte order is user settable and even on a per program basis. There are 8 global registers and 8 alternate global registers. One of them is active at a time and accessible as g0-g7. SPARC introduces a concept of register window. One window is 24 registers and the active window is pointed to by a special register called Current Window Pointer (CWP).

**DB 9 Connect Diagram? 5**

**Answer:- rep**

**Base Register Function? 5**

**Answer:- (Page 35)**

A base register is used in brackets and the actual address accessed depends on the value contained in that register. For example "mov [bx], ax" moves the two byte contents of the AX register to the address contained in the BX register in the current data segment. The instruction "mov [bp], al" moves the one byte content of the AL register to the address contained in the BP register in the current stack segment.

**Chargen Services Attributes? 5**

**Answer:- (Page 150)**

INT 10 - VIDEO - GET FONT INFORMATION

AX = 1130h

BH = pointer specifier

Return:

ES:BP = specified pointer

CX = bytes/character of on-screen font

DL = highest character row on screen

**Difference SHR&SAR? 2**

**Answer:- (Page 150)**

The sign bit is NOT retained in SHR operation while in SAR The sign bit is retained.

**Imported and exported symbols in NASM? 2**

**Answer:- (Page 189)**

In NASM an imported symbol is declared with the extern directive while an exported symbol is declared with the global directive.

**Int 21 Create or Truncate File? 3**

**Answer:- rep**

**What is CALL instruction work?**

**Answer:- (Page 64)**

CALL takes a label as argument and execution starts from that label, until the RET instruction is encountered and it takes execution back to the instruction following the CALL. The RET works regardless of the CALL and the CALL works regardless of the RET.

**SUN SPARC processor.....three basic characteristics.**

**Answer:- rep**