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IA

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ID No

13943

Subject

MAL

Date

22/8/20

Ques

Question No 1 (a)

Answer:

A virtual machine is an emulated computer system created using software. It uses physical system resource such as the CPU, RAM and disk storage but is isolated from other software on the computer. It can easily be created, modified or destroyed without affecting the host computer. Virtual machines provide similar functionality to physical machines but they do not run directly on the hardware. The software that manage more or one VM is called "hypervisor" and VM is called "guests". Each guest can interact with the hardware but hypervisor controls them.

Example :

Microsoft Hyper-V manager, VM ware workstation, etc. These application allow you to run multiple VM on per single computer.

For example

Parallels desktop for Mac.

Part b.

Answer

⇒ EIP:

The 32-bit version of IP. Always use this instead of IP on 32-bit system.

EAX,

Used for multiplication and division instruction.

ECX:

Its is used for counter loop

ESP

It is used for ordinary arithmetic or data transfer.

ESI and EDI,

Use by high-level language to reference function parameters and local variable on the stack.

Part C,

Answer.

It is used for desktop PCs with either an Intel Core2

2 D40 or Pentium D processor.

- ① Intel fast memory Access uses and updated memory cache controller hub. It can access dual-channel DDR2 memory at an 800 MHz clock speed. (K8/R/DH)
- ② An I/O controller hub [^] uses Intel Matrix storage Technology to support multiple serial ATA devices.
- ③ Support for multiple USB ports, PCI express slots, networking and Intel Quiet System technology.
- ④ A higher definition audio provides digital sound capabilities.

Pent d:

We can put I/O hierarchy into perspective by showing what happens when an application program displays a string of character on the screen. The following steps are involved.

- ① A statement in the application program calls on DLL library function that writes the string to standard out put.

The library function calls an operating system function passing a string pointer.

③ The OS function uses a loop to call a BIOS subroutine, passing it the ASCII code and color of each character.

④ The BIOS subroutine receives a character maps it to a particular system font and sends the character to a hardware port attached to the video controller card.

⑤ The video controller card generates timed hardware signals to the video display that control the raster scanning and displaying of pixels.

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Question No 2 : a)

Answer.

The main difference is the CPU is in. In protected mode the OS can use features like paging and virtual memory. Also real mode ~~code~~ code is never 32 bits where's protected mode code can be 16 bits or 32 bits. Every X86 CPU starts in real mode and OS must switch to protected mode. In real mode there is no multitasking no protection to keep one program from over writing. used by DOS. In protected mode it allows functionality like virtual memory paging and multitasking.

Part b,

Answer.

An instruction is a task to be carried out by the processor at run time. Instructions are assembled into machine code and eventually linked into the final executable.

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Question 3 b)

$$\neg A \wedge \neg B$$

A	B	$\neg A \wedge \neg B$
F	F	F T
F	T	F
T	F	F
T	T	F

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Question No 4: a)

Order of double word in memory is

0000:	21
0001:	34
0002:	65
0004:	87

value

Dword 12345678h

Part b:

Assembler statement to calculate the number of bytes in given string is as following.

myString BYTE "I am student of IIT"

myString - Len = (\$ - myString)

Size - string = (\$ - myString)

(C)

- model = flat, stdcall
- Stack 4096
- ~~Exit~~ Exit process photo, dw Exit code: dword
- Code

Main PROC

; assign integer values to register

```

mov eax, 150 ; A = EAX = 150
mov ebx, 100 ; B = EBX = 100
mov ecx, 50 ; C = ECX = 50
mov edx, 40 ; D = EDX = 40

```

; calculate the expression

```

add ecx, ebx ; ECX = (C + B)
sub ecx, eax ; ECX = (C + B) - A
mov edx, ecx ; D = (C + B) - A

```

invt invoke Exit process, 0

main ENDP

END main

(d)

Program $A = (A+B) - (C/D)$

.model flat, stdcall

.stack 4096

Exit process proto, @wexit code: dword

.code

main PROC

mov eax, 150 ; A = EAX = 150

mov ebx, 100 ; B = EBX = 100

mov ~~ecx~~ ecx, 50 ; C = ECX = 50

mov edx, 40 ; D = EDX = 40

add eax, ebx ; EAX = (A+B)

Div eax, edx ; ECX = (C/D)

Sub eax, ecx ; EAX = (A+B) - (C/D)

invoke Exitprocess, 0

main ENDP

~~END~~

END main

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A directive is an instruction to the assembler telling it how to treat the data it is asked to assemble. Directives are only used at assembly time.

Example

In 286 code the ORG are directives. They don't result in any code generator.

D) Answer

Data Label:

~~that used to~~

that use to define data as we define memory location

It is the label

num 1, num 2 etc

Code Label

It is the label that we have on code as we see in case of conditional jump (Label 12) and is normally used for loop control statement.