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Section B (BSCS)

COAL ASSIGNMENT #1

Date

(Q1)

- Role of Compiler:

Compiler converts the high-level programming language into assembly language (close to machine language/ computer understable language) and then the assembler converts it into machine language. The compiler can also converts high level programming language into machine code directly without converting it to assembly language first as an intermediate.

- Role of OS:

The OS loads the machine language program into the memory when the program is launched the working framework dispatches the program, adding a space of memory in the RAM for the program. The initial part of the program's machine code is stacked into that allotted memory. Furthermore, the OS guides the CPU as to how to begin running the code.

- Role of Linking:

After the creation of object file by the assembler the process of linking is performed to produce the executable file in which the linker reads the object file to check for any calls to procedures in the link library. The linker then copies any required procedures from the linked library, combines them with the object file and produces the executable file.

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(Q2)

In real-address mode the segment register holds the base address of pre-assigned memory areas of the RAM.

In protected mode the segment register holds pointers to the descriptors which tells us about the location, lenght and access rights of memory segments.

(Q3)

a) segment = ABOEh
offset = 5D89h
Real Address = ?

Real Address = (segment * 10) + offset
= ABOE0h + 5D89h
= BOE69h

b) Segment = 8FE3h
offset = ?
Real Address = A835F h

Real Address = (segment * 10) + offset
A835F h = 8FE30h + offset

offset = A835Fh - 8FE30h
= 1852Fh

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c) Segment = ?
Offset = 5E6Dh
Real Address = FF41Dh

Real Address = (segment * 10) + Offset
FF41Dh = (segment * 10) + 5E6Dh
segment = (FF41Dh - 5E6Dh) / 10
segment = F95Bh

d) Segment = ?
Offset = ?
Real Address = A5B6Dh

let offset = F88Dh

Real Address = (segment * 10) + offset
A5B6Dh = (segment * 10) + F88Dh
segment = (A5B6Dh - F88Dh) / 10
segment = 962Eh

(Q4)

.class file of java is platform independent because the compiler converts source code to bytecode (.class) which is an intermediate language and can be executed on any operating system (platform). Whereas, the machine code is made by Java virtual machine and it depends on the operating system which makes it platform dependent.

(4)

Date

(Q5)

Real mode can only access memory with addresses below 1MB which is called conventional memory. However virtual - 8086 is real mode running on protected mode in order to execute a 16-bit program in 32-bit protected environment. MS-DOS run in real-address mode and the address demand direct access to system files which causes the OS to crash. But in virtual mode, MS-DOS is having shared memory and do not have direct access to the system files therefore, the OS does not crash as it is running as not.

(Q6)

Control flags:- The flags which determines how instructions are carried out.

Status flags:- The flag which reports on the result of operations