جامعة القادسية
كلية تكنولوجيا المعلومات
قسم الحاسبات

بسم الله الرحمن الرحيم

المادة :برمجة نظام
الصف: الثاني
الزمن : 3 ساعات
الدور:
التاريخ: 2016/ 5/14

اسئلة الأمتحان النهائي للعام الدراسي 2015-2016

ملاحظة:-

1. الاجابة على اربعة اسئلة فقط.
2. من حق الطالب ترك اي سؤال باستثناء السؤال الثاني.

Q1. Explain the following :- (10 marks)

1. Disadvantage of Compile and go loader.
2. Advantage of General loader Scheme.

Q2. Full the blank with the fit word :- (15 marks)

3. In operating system, efficiency allows the computer system _____.
4. Hardware consist of _____,_____ and _____.
5. Operating system makes the programming task easier. Some of the common services provided by operating system are _____,_____ and_____.
6. Spooling refers to _____.
7. Advantages of multiprogramming system_____ and _____.

Q3. Define multiprocessor system and explain the following :- (10 marks)

8. their two types
9. the differences between them
10. the feature of multiprocessor system.

Q4. Answer the following multiple choice question:- (10 marks)

1. One of the following is not application program
   A. Word processor.
   B. Web browser.
   C. Paint.
   D. None of above.

2. The process of calculating size of program and space determination of programs is called
   A. Allocation
   B. Reallocation
   C. Loading
   D. None of above
3. One of these loaders do not deal with .obj file
   A. General loader scheme.
   B. Absolute loader.
   C. Compile and go loader.
   D. None of above.
4. " Simple to implement" is one advantage of the following loader
   A. Compile and go loader as well as General loader scheme.
   A. Absolute loader as well as Compile and go loader
   B. Absolute loader as well as General loader scheme.
   C. None of above.
5. Computational allocation task to processor is one function of :-
   A. Compiler.
   B. Assembler.
   C. Loader.
   D. Operating system.

Q5. Answer of the following: - (10 marks)

1. Define and draw Absolute loader scheme.
2. Write absolute loader algorithm.

رئيس القسم

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A

Q1.

1.

Disadvantages

• In this scheme some portion of memory is occupied by assembler which is simply a wastage of memory. As this scheme is combination of assembler and loader activities, this combination program occupies large block of memory.

• There is no production of .obj file, the source code is directly converted to executable form. Hence even though there is no modification in the source program it needs to be assembled and executed each time, which then becomes a time consuming activity.

• It cannot handle multiple source programs or multiple programs written in different languages. This is because assembler can translate one source language to other target language.

• For a programmer it is very difficult to make an orderly modulator program and also it becomes difficult to maintain such program, and the "compile and go" loader cannot handle such programs.

• The execution time will be more in this scheme as every time program is assembled and then executed.

A

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2.

Advantages

•The program need not be retranslated each time while running it. This is because initially when source program gets executed an object program gets generated. Of program is not modified, then loader can make use of this object program to convert it to executable form.

• There is no wastage of memory, because assembler is not placed in the memory, instead of it, loader occupies some portion of the memory. And size of loader is smaller than assembler, so more memory is available to the user.

• It is possible to write source program with multiple programs and multiple languages, because the source programs are first converted to object programs always, and loader accepts these object modules to convert it to executable form.

Q2.

1. **Computer system resources to be used in efficient manner.**
2. **CPU, Memory and I/O devices.**
3. **Program execution, I/O operation and file system manipulation.**
4. Spooling refers to putting jobs in a buffer, a special area in memory or on a disk where a device can access them when it is ready.
5.
   1. High CPU utilization.
   2. It appears that many programs are allotted CPU almost simultaneously.

Q3.

• Multiprocessor system have more than one processor in close communication. They share the computer bus, system clock and input output devices and sometimes memory. In multiprocessing system, it is possible for two processes to run in parallel.

• Multiprocessor systems are of two types: symmetric multiprocessing and asymmetric multiprocessing.

• In symmetric multiprocessing, each processor runs an identical copy of the operating system and they communicate with one another as needed. All the CPU shared the common memory.

Figure below shows the symmetric multiprocessing system.

• In asymmetric multiprocessing, each processor is assigned a specific task. It uses master-slave relationship. A master processor controls the system. The master processor schedules and allocates work to the slave processors.

Figure below shows the asymmetric multiprocessor.

Features of multiprocessor systems

1. If one processor fails, then another processors should retrive the interrupted process state so that executation of the process can continue.
2. The processors should support efficient context switching operation.
3. Multiprocessor system supports large physical address space & large virtual address space.
4. The IPC mechanism should be provided & implemented in hardware as it becomes efficient & easy.

Q4.

1. D

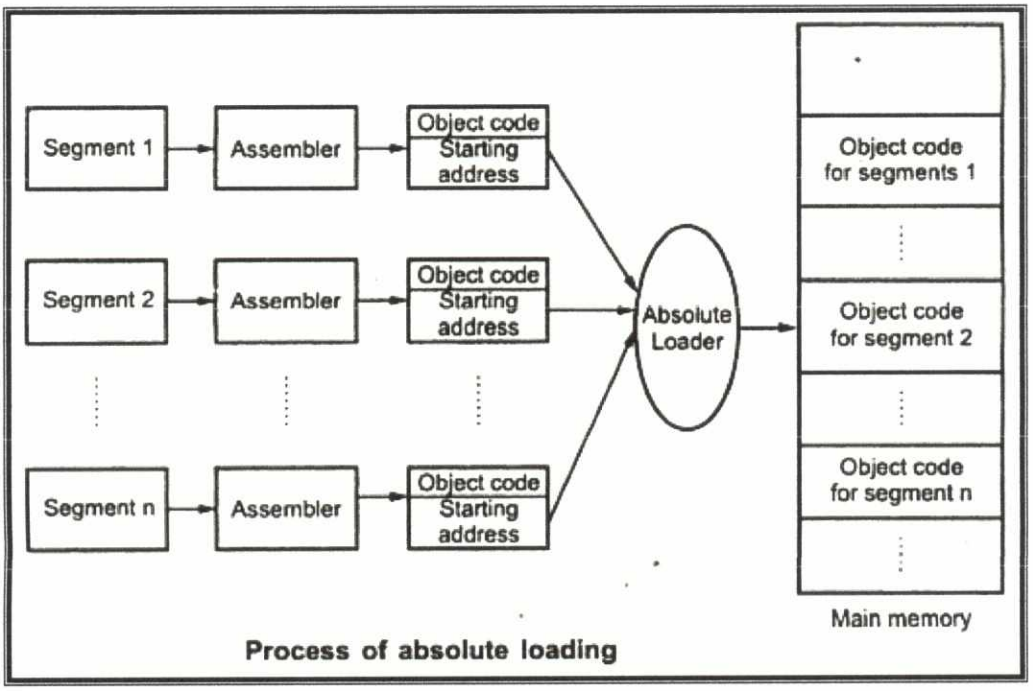
2. A.
3. C.
4. B.
5. D.

Q5.

1.

Absolute loader is a kind of loader in which relocated object files are created, loader accepts these files and places them at specified locations in the memory. This type of loader is called absolute because no relocation information is needed; rather it is obtained from the programmer or assembler. The starting address of every module is known to the programmer, this corresponding starting address is stored in the object file, then task of loader becomes very simple and that is to simply place the executable form of the machine instructions at the locations mentioned in the object file. In this scheme, the programmer or assembler should have knowledge of memory management. The resolution of external references or linking of different subroutines are the issues which need to be handled by the programmer. The programmer should take care of two things: first thing is : specification of starting address of each

module to be used. If some modification is done in some module then the length of that module may vary.



Process of absolute loading

2.

Algorithm for absolute Loader

Input : Object codes and starting address of program segments.

Output : An executable code for corresponding source program. This executable code is to be placed in the main memory.

Method :

```
Begin
  For each program segment do
  Begin
       Read the first line from object module to obtain
       information about memory location. The starting
       address say S in corresponding object module is
       the memory location where executale code is to
       be placed.
       Hence
       Memory_location = S
       Line_counter = 1; as it is first line
       While (! end of file)
       For the curent object code do
  Begin
  1. Read next line
  2. Write line into location S
  3. S = S + 1
  4. Line_counter = Line_counter + 1

  end
    end
end
```