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|---|---|
| 1 | What you understand by a memory manager in an Operating System. What are various memory management schemes? Explain any five of them with figures and examples giving all details. |
| 2 | a)What you understand by code optimization phase of compiler? Explain various techniques of code optimization? <br><br> b) What is a conditional breakpoint in a debugger? <br><br> c) Find the space required for entire page table, given that <br><br>      the virtual space is 4G bytes ( 1G = 10^9 ) <br><br>      each page size is 4k <br><br>       each page table entry is 4 bytes <br><br> d) Explain the following instruction <br><br>     SVC <br><br>     TIO <br><br>     IC <br><br>  e)   What you understand by absolute loaders. Explain. <br><br>  f)   What is dynamic linking? Give its pros and cons. |
| 3. | a)What are linkage conventions using a save area. Discuss the assembly code while calling a function and while returning from a function to link both the modules. <br><br> b) Solve the macro processor part of the EDIT program given at the back and make <br><br>     (i)  MNT <br><br>     (ii) ALA <br><br>     (iii) MDT <br><br>    Also expand the program that will be used for the linker part. <br><br> c)  Solve the Linker part and make the RLD,ESD for both the programs   EDIT & LINK given in the back. The output of these programs is to be combined by using a GEST assuming the program EDIT is starting at memory location 60 in the main memory and the program LINK start immediately after the first program with a double word alignment. |
| 4 | Make assembler tables for the output from the linker part after you get a single linked module <br><br> a) <br><br>     (i)     ST |

(ii)     LT

(iii)    BT

(iv)    MOT

(v)     POT

b) Convert the program using IBM 370 assembler and write the machine code in the hexadecimal code format. Assume the hex code of every Instruction to be 1C.

|       |         |             |
|-------|---------|-------------|
|       | MACRO   |             |
|       | MACPRO  | &ABC,&DEF   |
|       | GBLA    | &GHI        |
|       | AR      | &ABC,&DEF   |
|       | A       | 3,JKL       |
| &GHI  | SETA    | 9           |
|       | NC      | MNO,PQR     |
|       | CR      | &ABC,&GHI   |
|       | D       | &DEF,STU    |
|       | MACLINK | 5           |
|       | LR      | 8,11        |
|       | MEND    |             |
|       | MACRO   |             |
|       | MACLINK | &XYZ        |
|       | LCLA    | &GHI        |
|       | GBLA    | &STU        |
|       | OR      | 1,&XYZ      |
| &GHI  | SETA    | 7           |
| &STU  | SETA    | 8           |
|       | SR      | &GHI,&GHI   |
|       | ST      |             |
| EDIT  | START   |             |
|       | EXTRN   | WIFI        |
|       | ENTRY   | WIN         |
|       | BALR    | 15,0        |

```
            USING       *,15
VW          EQU         10
            SL          8,=F"12"
            CH          12,=H"9"
            MACPRO      3,4
            MVI          WIN,9
            LTORG
            DROP        15
            DS          0D
JKL         DC          5X'4C',B'10001000'
MNO         DC           C'COMPUTER'
PQR         DC           D'34'
WIN         DC           A(WIFI+WIN),A(WIN-EDIT)
            END


LINK        START
            EXTRN       EDIT
            ENTRY       WIFI, TFT
TEN         EQU         10
            SLR         TEN,10
TFT         MR          6,TEN
            LCR         4,7
            XR          6,9
            NR          TEN,11
WIFI        DC           A(TFT-EDIT-LINK+WIFI),A(EDIT)
            END
```