15097

B. Tech 4th Semester Examination
System Software (OS)
CS(ID)-4001

Time : 3 Hours   Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one question each from sections A, B, C and D. Section - E is compulsory.

SECTION - A

1. (a) Differentiate between the following:
    (i) Processor and Procedure.
    (ii) Procedure and Program.
    (iii) Processor and I/O Channel.
    (iv) multiprocessing and multiprogramming.
    (v) open subroutine and closed subroutine.   (10)

    (b) Bits in the memory may represent data or instruction. How does the processor know whether a given location represents an instruction or a piece of data?   (10)

2. (a) What is the instruction set of a machine? Does it vary with respect to the different machines? Justify the significance of addressing modes used in the machines.   (10)

    (b) What is meant by bitwise operation? Describe the two bitwise shift operations. What requirement must the operands satisfy? What is the purpose of each operand?   (10)

[P.T.O.]

SECTION - B

3. (a) Explain macros and macroprocessor. What are the assembly statements which will replace the macro call as a result of macro expansion?   (10)

    (b) How a two pass assembler is designed? Compare it with one pass assembler.   (10)

4. (a) If the assembler is processing a macro call and this macro contains a macro definition, would a new stack frame be set up? If so, what information would be stored?   (10)

    (b) In order to be able to process macros in a single pass, we had to restrict the macro language. Describe the restriction and limitations that it imposes on program organization.   (10)

SECTION - C

5. (a) List at least two advantages and disadvantages of binding at load time over binding at assembly time.   (10)

    (b) Explain dynamic linking & dynamic loading. Also explain dynamic link libraries and its usage.   (10)

6. (a) Describe the overall design for a simple relocating loader that will load a single segment with no external references.   (10)

    (b) Explain the features of machine dependent loader, also discuss the various loader design options.   (10)

SECTION - D

7. (a) Categorize the different types of interrupts. Explain all software interrupts with their relative priorities and levels.   (10)

(b)   What is the primary advantage of using a data file? Describe the different ways in which data files can be categorized in C.   (10)

8. (a)   What are device drivers? Are these drivers platform dependent or independent? What are the different ways the Linux can switch from user space to kernel space?   (10)

(b)   Discuss in detail the internal structure of DOS, explaining how booting is done in case of DOS?   (10)

SECTION - E

9.   Answer short answer type questions:

(a)   What is re-locatable code?

(b)   Give some insights into the task performed by linkage editor.

(c)   What do you mean by program overlays? State the advantages of overlay structure.

(d)   What do you mean by interactive programming environments?

(e)   Write an example code for nested macro definition.

(f)   Give the difference between BALR and USING, DC and EQU for IBM 360.

(g)   What is BSS loader? Give its advantages and disadvantages.

(h)   Describe the input and output of macro-processor.

(i)   Do we really need a two-pass assembler? Why?

(j)   Define the following terms in one or two sentences: Hashing, sorting and searching.   (10×2=20)