53 (CS 501) SYPR

2016

SYSTEM PROGRAMMING

Paper : CS 501

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Questions **6** & **7** *are* **Compulsory** *and answer* **any three** *from the rest.*

1. *(a)* Explain the different System Softwares for run-time environment.   8

    (b) What is Language Processor and describe the significance of Semantic Gap with diagram ?   8

    (c) Briefly describe the boot strapping with example.   4

2. *(a)* What is the disadvantage in Absolute loader ? How to overcome this problem with another loader scheme ? 4

(b) Explain the Linking Loader and Linkage Editor with the diagram. Describe the use of linking loader and linkage editor. 8

(c) How to recognize the Macro Call and also the expansion ? Define the Copy Code and Parameter substitution expansion with examples. 8

3. *(a)* Describe the compiler (6 Passes) with a diagram and also mention the list of data structures of Compiler. 14

(b) Draw the diagrams of intermediate representation of Compiler (Front end and back end). 6

4. *(a)* Mention the data structures used in Compiler for memory allocation and de-allocation, and how to identify the free memory. 5

(b) Define the memory compaction with the diagrams and also describe the techniques for fresh allocation. 5

(c) What is program relocation ? Explain this program relocation with the formulas. 10

5. *(a)* Explain the *three* different kinds of files in UNIX File system, and explain the functions of operating system. 6

(b) What do you mean by environmental variables and write down the different environmental variables ? 6

(c) What is the use of redirection in the input and output ? 4

(d) Mention the problem arises in redirection, and how to overcome this problem. 4

6. *(a)* Draw a UNIX File system tree in hierarchical structure form with the descriptions. 4

(b) Match the following given UNIX commands and their operation in terminal/shell : 6

Pg filter	To display the output of a command on the screen in next page by pressing "Space Bar"

More filter	To display the output of a command on the screen page by page
Cut Command	One particular field/character is extracted from a file or output of any command
Paste Command	The output of particular command can be used later but stored in long pipelines Merge
Tee Command	The contents of two files into a single file
Tr Command	To translate the characters taken from Std I/P or a file to upper case/lower case

(c) Fill in the blanks with the appropriate words in the given options : 10

(i) UNIX is an example of _____ user operating system. (multi/ single)

(ii) Memory management is a function of an _____ . (OS/Loader)

(iii) Efficiency of the UNIX system decreases as the number of terminal _____ . (increases/ decreases)

(iv) UNIX is written in _____ language. (Java/C/C++)

(v) _____ forms the core of the UNIX operating system. (Kernel/Shell)

(vi) Shell forms the interlace between the _____ and user. (kernel/OS)

(vii) The Head command is used as a complement to the _____ command, (tail/more)

(viii) A directory can be created only if _____ permission exists, (read/write/execute)

(ix) The _____ command is used to display the lines with single occurrences, (uniq –d/uniq –u/ls –d)

(x) We can use –r option to interact with the _____ command. (rm /ls)

7. *(a)*   10

(i) The '/bin' directory contains the executable files for most UNIX commands.

(ii) The UNIX system is based on the concept of time-sharing.

(iii) Bourne shell was developed by Stephen Bourne.

(iv) Permissions can be granted or revoked for a particular file using the chmod command.

(v) 'Esc' key can be used to change to the 'ex' escape command mode.

(vi) The ':' set number commands helps in numbering the text in the file.

(vii) A line of file can be deleted using 'dd' key.

(viii) 'Pipes' are temporary files stored in memory.

(ix) A particular portion of a file can be extracted using 'filters'.

(x) UNIX commands can perform multiple tasks using a single command.

(b) Differentiate between : *(any four)*

$$2{\cdot}5\times4=10$$

(i) Declare constant and Declare Storage

(ii) Specification & Execution Gap

(iii) MOVER & MOVEM

(iv) Top down and bottom up parsing

(v) User mode and Kernel mode (Unix System related)

(vi) Syntax analysis and Semantic analysis (Compiler related)