CS/BCA (SUPPLE)/SEM-5/BCAE-501A/09
ADVANCED UNIX AND SHELL PROGRAMMING (SEMESTER - 5)



1. .....
Signature of Invigilator

2. .....
Signature of the Officer-in-Charge

Reg. No. | | | | | | | | | | | | | | |

Roll No. of the Candidate | | | | | | | | | | | | | | |

CS/BCA (SUPPLE)/SEM-5/BCAE-501A/09
ENGINEERING & MANAGEMENT EXAMINATIONS, AUGUST – 2009
ADVANCED UNIX AND SHELL PROGRAMMING (SEMESTER - 5)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

.....
Head-Examiner/Co-Ordinator/Scrutineer

S-54043 (20/08)

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ADVANCED UNIX AND SHELL PROGRAMMING

SEMESTER – 5

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Which system call is used to random access to a file ?

a) read b) write

c) open d) lseek. ☐

ii) Which part of the operating systems gets loaded into memory as soon as the system is booted ?

a) Kernel b) Shell

c) U area d) None of these. ☐

iii) Where does the kernel store the read and write offsets for named pipe ?

a) file table b) inode

c) file descriptor table d) none of these. ☐

iv) Remembered inode is the ..... inode saved in the superblock.

a) first b) last

c) any free d) none of these. ☐

v) The kernel never overwrites data in

a) regular file b) directory

c) pipes d) none of these. ☐

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vi) The state of the file system is contained in

a) inode block b) boot block

c) superblock d) data block.

vii) Regarding storage allocation pipe uses

a) direct & indirect block b) only direct block

c) inode block d) superblock.

viii) Which of the following system calls returns a file descriptor ?

a) read b) write

c) pipe d) link.

ix) Your shell script has a name ls. If you execute ls

a) your script would get executed

b) the ls command would get executed

c) whether script is executed or command is executed depends upon the value of PATH

d) both ls and the script would get executed one after another.

x) A process can access its U area when it executes in

a) kernel mode b) user mode

c) any of the mode d) none of these.

xi) Which system call is used to send signal to the process

a) signal b) kill

c) sigcatch d) none of these.

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xii) The kernel handles signals only when a process returns from

a) user mode to kernel mode b) kernel mode to user mode

c) region d) none of these. ☐

xiii) The stream is a ..... connection between process and device drivers.

a) half-duplex b) full-duplex

c) simplex d) asynchronous. ☐

xiv) The kernel sends the signal to all processes whose real user id equals the effective user id of the sender when its pid is

a) positive integer b) zero

c) negative integer but not – 1 d) – 1. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. a) Define context of a process. Write down the difference between context switch and change in mode for processes. 2 + 2

b) Name the process whose pid is zero. 1

3. Describe with example how system converts a path name to an inode. 5

4. a) What is the purpose of lseek ( ) system call ? Write the syntax of the system call.

b) What is the role of file table in file handling ? 2 + 1 + 2

5. a) What is a region ? 2

b) What is the main goal of the memory management ? 3

6. Describe swapping and demand paging and describe their advantages. 5

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GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Draw a neat block diagram to represent the system kernel and describe the functions of various modules in it. 6

   b) Why do you need to run *X* clients in the background ? Which component of *X* is responsible for displaying a window on the screen ? What is the essential difference between these two commands ?

   *x*term – g 40* 14 + 0 + 0

   *x*clock – g 40* 14 + 0 + 0 2 + 1 + 2

   c) What information does a superblock contain ? Why there is a memory copy and a disk copy of inode block and superblock ? 2 + 2

8. a) Write the algorithm for the read ( ) system call by stating its syntax. 4

   b) What data structures present in the kernel are affected, when a process starts and a file is opened ? 4

   c) Explain how the inode structure address fields store data block information. 4

   d) A unix file system has 1024 bytes block size with 32 bit address. The inode has 10 direct, one indirect and one double indirect address. What is the maximum file size it can access ? 3

9. a) Suppose a process changes its current directory to "mnt/a/b/c" and a second process then mounts a file system onto "/mnt". Should the mount succeed ? What happens if the first process executes pwd ? The kernel does not allow the mount to succeed if the inode reference count of "/mnt" is greater than 1. Comment. 2 + 2 + 3

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b) What is U area ? How is it related to region table ? 2 + 3

c) The init process spawns a getty process for each terminal line in the system. What would happen if two getty processes were to exist simultaneously for one terminal, waiting for a user to log in ? Can the kernel prevent this ? 2 + 1

10. a) Describe the algorithm to create a new process which is used by the fork system call. 4

b) What are semaphores ? How are they created ? Describe its data structure. 2 + 2 + 3

c) What is pipe ? How can data be read from or written to a pipe ? 1 + 3

11. a) What is signal ? What are its classifications ? How are signals handled by the kernel ? 1 + 2 + 4

b) What are sockets ? What are they used for ? 2 + 2

c) What is select ( ) and poll ( ) ? What are their differences ? 2 + 2

END

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