

## AMIETE – CS/IT

Time: 3 Hours

DECEMBER 2014

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**NOTE: There are 9 Questions in all.**

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions, answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

**Q.1 Choose the correct or the best alternative in the following: (2×10)**

- a. Which directories contain the central sections of the kernel?
- (A) kernel/ (B) arch/i386/kernel/  
(C) Both (A) & (B) (D) None of these
- b. \_\_\_\_\_ call is used to create a bootable LINUX kernel.
- (A) # make depend (B) # make oldconfig  
(C) # make drivers (D) # make boot
- c. \_\_\_\_\_ variable holds the time the process has spent in System Mode.
- (A) utime (B) cstime  
(C) stime (D) cutime
- d. Which command is used to set limits on file size?
- (A) fsize (B) flimit  
(C) ulimit (D) usize
- e. \_\_\_\_\_ function is used to map the device to user address space.
- (A) lseek (B) mmap  
(C) readdir (D) fsync
- f. Which of the following is true about `int brk(void *addr)`?
- (A) It sets the end of the data segment to the value specified by `addr`, when that value is reasonable, the system has enough memory, and the process does not exceed its maximum data size.
- (B) It change the location of the program break, which defines the end of the process's data segment.
- (C) The return value described above for `brk()` is the behavior provided by the glibc wrapper function for the Linux `brk()` system call.
- (D) All of these

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- g. Pid of init process is \_\_\_\_\_.
- (A) 0 (B) 1  
(C) 32767 (D) None of these
- h. Locks can be removed using
- (A) F\_UNLCK (B) F\_RDLCK  
(C) F\_WRLCK (D) None of these
- i. Which command is used to check file system usage in a system?
- (A) mount (B) df  
(C) du (D) dd
- j. The structure proc\_root\_inode\_operations provides \_\_\_\_\_.
- (A) the component readdir in the form of the proc\_readroot() function  
(B) the component lookup as the proc\_lookup function  
(C) Both (A) & (B)  
(D) None of these

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**Answer any FIVE Questions out of EIGHT Questions.**  
**Each question carries 16 marks.**

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- Q.2** a. Explain any 5 main characteristics of LINUX. (10)
- b. Classify drivers/ directory according to their subdirectories. (6)
- Q.3** a. Describe the states within a process with the help of a neat diagram. (8)
- b. Write and explain the algorithm for the booting of a LINUX system. (8)
- Q.4** a. Explain with a neat diagram, the Linear address conversion in the architecture-independent memory model. (6)
- b. What do you understand by static and dynamic memory allocation in the kernel segment? Explain. (10)
- Q.5** a. Show the implementation of synchronization in the LINUX kernel. (10)
- b. How is inter-process communication achieved in Linux? Explain. (6)
- Q.6** a. Write a note on any four file operations in LINUX. (8)
- b. Explain, how the Virtual File System interacts with a file system implementation? (8)

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- Q.7** a. How do large volumes of data get transported continuously to or from a device? Explain. (8)
- b. Write a note on read() and write() functions. (8)
- Q.8** a. Explain socket structure with the help of a block diagram. Show relationship of the socket with its substructure. (6)
- b. Write notes on following protocols- ARP and IP. (10)
- Q.9** a. In order to implement SMP in Linux kernel, what changes have to be made? Explain. (8)
- b. Describe the functions of create\_module, init\_module and delete\_module. (8)