ROLL NO. _____

Code: AC72/AT72 Subject: LINUX INTERNALS

AMIETE – CS/IT (NEW SCHEME)

Time: 3 Hours **DECEMBER 2011** **Max. Marks: 100**

NOTE: There are 9 Questions in all.

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **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. The full form for POSIX is:

(A) Post Operating System for UNIX
(B) Pennsylvanian Operating System Interface for UNIX
(C) Portable Operating System Interface for UNIX
(D) None of the above.

b. How many entries are made in the Kernel for each file used in the system?

(A) Three **(B)** Two
(C) One **(D)** Four

c. The kernel uses _____ to abort processes or to switch interactive programs to a defined state.

(A) signals **(B)** nice
(C) pause **(D)** timers

d. Communication via ____ is the oldest way of exchanging data between programs.

(A) directories **(B)** folders
(C) files **(D)** None of the above

e. The kernel threads that write the buffer back to hard disk are

(A) Bdflush **(B)** Kupdate
(C) Both **(A)** and **(B)** **(D)** None of the above

f. The basic idea of ____ is to initialize the card during the first access and adjust the parameters such as basic address, IRQ and DMA channels during the boot.

(A) PnP **(B)** CnC
(C) None of the above **(D)** Both **(A)** and **(B)**

g. The first version of LINUX kernel became available on the internet in _____

(A) 1991 **(B)** 1981
(C) 2001 **(D)** None of the above

h. LINUX does not support more than one format for executable files

(A) True **(B)** False

i. In order to implement SMP in the LINUX kernel, changes should be made

(A) portable port **(B)** processor specific port
(C) Both **(A)** and **(B)** **(D)** None of the above

j. All the information which is essential for managing the file system is held in:

(A) Data block **(B)** Inode block
(C) Boot block **(D)** Super block

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

Q.2 a. How LINUX is distributed? Explain. **(7)**

b. Describe the nine groups of drivers used in LINUX along with the subdirectories in which they are stored. **(9)**

Q.3 a. Describe any four important states in a process. **(8)**

b. Explain the meaning of the system call *pause*. Can the process be reactivated once it is interrupted? **(8)**

Q.4 a. What are bdflush and kupdate? How are they used? What is the advantage of the combination of bdflush and kupdate? **(8)**

b. Describe the process of Static Memory Allocation in the kernel segment. **(8)**

Q.5 a. What is race condition? **(4)**

b. Draw a diagram depicting a deadlock scenario when locking files. **(4)**

c. Explain ipcs and ipcrm commands with the help of an example. **(8)**

Q.6 a. Explain different layers in the LINUX file system with the help of a diagram. **(8)**

b. Describe DEntry operations. **(8)**

Q.7 a. What are the device drivers? What role does OS play vis-á-vis device drivers? **(8)**

b. Briefly describe different transfer operation modes supported by the DMA controller. **(8)**

Q.8 a. Describe the demands of network communication on an operating system and their implementation in LINUX. **(8)**

b. What are the differences between SLIP and PLIP? **(8)**

Q.9 a. State three basic rules that were considered during the development of multiprocessor LINUX kernel system. **(8)**

b. What is the need for coding Atomic Operations in the header file asm/atomic.h? How are the atomic data type variables defined, accessed, changed and tested? **(8)**