Code: AC72/AT72 Subject: LINUX INTERNALS

AMIETE – CS/IT

Time: 3 Hours **JUNE 2013** **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. A process can influence the access mode of new files that have to be created via the system call _____

  (A) umask (B) setfsuid
  (C) chroot (D) none of these

b. Inodes contain information such as _____

  (A) file's owner (B) access rights
  (C) both (A) & (B) (D) none of these

c. A software interrupt is like a hardware interrupt, an event that can be activated which leads to the processing of the interrupt handling routine.

  (A) FALSE (B) TRUE

d. The linear addresses need to be converted into physical address by _____

  (A) the processor (B) a separate MMU
  (C) any of the above (D) None of these

e. Every Ethernet adapter has a completely unique address which is _____ bytes long

  (A) 2 (B) 4
  (C) 6 (D) 8

f. Which of the following is not a way for interprocess communication?

  (A) files (B) shared memory
  (C) pipes (D) DMA

g. Communication via _____ is the oldest way of exchanging data between programs,

(A) data   **(B)** files
(C) pointers   **(D)** folders

h. _____ is an important factor for file system

(A) random access   **(B)** speed of access
(C) None of these   **(D)** Both **(A)** & **(B)**

i. In the world of PnP, the concepts device and function are used to recognize _____ units.

(A) hardware   **(B)** software
(C) flowchart   **(D)** Both **(A)** & **(B)**

j. Through _____ it is possible to use modems and telephone lines to set up network links to anywhere in the world

(A) SLIP   **(B)** PPP
(C) PLIP   **(D)** none of these

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

Q.2   a.   What are the characteristics of LINUX?   **(8)**

b.   "New Kernel is generated in 3 steps". What are those 3 steps? Explain in detail.   **(8)**

Q.3   a.   What is the main advantage and drawback of using micro kernel architecture?
                                                                                  (8)

b.   Can the process be reactivated once it is interrupted?   **(8)**

Q.4   a.   Describe in detail how the virtual Address Space for a Linux Process is used.
                                                                                  (8)

b.   Describe the process of "Converting the Linear address into a physical address" through a diagram.   **(8)**

Q.5   a.   Discuss how Shared Memory is used for inter process communication.   **(8)**

b.   Explain how ptrace is used by debuggers.   **(8)**

Q.6 a. Describe the opening of a file operation of the textbook. **(8)**

b. What is Superblock? What does it contain? **(8)**

Q.7 a. What is the difference between character and block devices? **(4)**

b. Discuss the method to create a Kernel Driver for the PC Speaker. **(12)**

Q.8 a. Describe the socket structure with the help of a diagram, draw the socket and the relationship to its substructure. **(9)**

b. Discuss the network devices: PLIP and the dummy device in Linux. **(7)**

Q.9 a. What are modules? Describe how data mapping takes place between modules. **(10)**

b. What are the problems with multiprocessor systems? How are they overcome in UNIX-like systems? **(6)**