ROLL NO. _____

Code: AC72/AT72/AC117/AT117 **Subject: LINUX INTERNALS**

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours **December - 2017** **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. In Linux, a task is a generalization of the usual _____ concept.
(A) thread **(B)** class
(C) process **(D)** program

b. Two important attributes of a process in Linux are
(A) PID & PPID **(B)** SID & SSID
(C) ID & VID **(D)** INIT & GETTY

c. Which of the following command can you execute to count the number of lines in a file?
(A) Lc **(B)** wc – l file
(C) Cl **(D)** Count

d. _____ variable holds the time the process has spent in System Mode.
(A) utime **(B)** cstime
(C) stime **(D)** cutime

e. Pid of init process is _____.
(A) 0 **(B)** 1
(C) 32767 **(D)** None of these

f. Protocol used for connecting to a remote host is _____.
(A) ftp **(B)** telnet
(C) tcp/ip **(D) N**one of these

g. What file specifies the order in which to use specified name services?
(A) /etc/services **(B)** /etc/nsorder
(C) /etc/nsswitch.conf **(D)** /etc/hosts

h. What command is used to display the characteristics of a process?
(A) au **(B)** ps
(C) du **(D)** pid

i. The expansion for tgid is:
(A) Test Group ID **(B)** Task Group ID
(C) Thread Group ID **(D)** None of these

j. The expansion for ddr is:
(A) Digital Double Rate **(B)** Data Double Rate
(C) Double Data Rate **(D)** None of these

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

Q.2 a. Explain sequence of steps to compile kernel. **(8)**

b. Mention any four main characteristics of LINUX operating system. **(4)**

c. Mention any four group device drivers in LINUX along with subdirectories in which they are stored. **(4)**

Q.3 a. What are the basic data structures and algorithms in the Linux? **(8)**

b. Explain any **TWO** of the following System Calls: **(8)**
(i) getuid (ii) nice
(iii) fork (iv) pause

Q.4 a. What are bdflush and kupdate and how are they used? What is the advantage of the combination of bdflush and kupdate? **(7)**

b. What do you understand by static and dynamic memory allocation in the kernel segment? Explain. **(9)**

Q.5 a. Describe, how a debugger uses ptrace? **(12)**

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

Q.6 a. Describe the two algorithms used by Ext2 file system to limit the fragmentation of files. **(4)**

b. Discuss about the Superblock of the Ext2 file system. **(4)**

c. Explain Proc file system. **(8)**

Q.7 a. What is the difference between Polling and Interrupts? **(8)**

b. How do large volumes of data get transported continuously to or from a device? Explain. **(8)**

Q.8 a. Explain the layer structure of a network. **(8)**

b. Explain the network devices under LINUX. **(8)**

Q.9 a. Explain different functional units which can be implemented as modules. (**8**)

b. What are the problems with multiprocessor systems? How are they overcome in UNIX-like systems? **(4)**

c. Mention various module functions used in Kernel. **(4)**