Code: AC71/AT71   **Subject: UNIX SYSTEMS PROGRAMS**

AMIETE – CS/IT

Time: 3 Hours   **DECEMBER 2014**   Max. Marks: 100

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 half an hour 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 of the following is not one of the common shells used on UNIX systems?

   (A) Bourne shell   **(B)** C shell
   (C) Bourne-again shell   **(D)** Torn shell

b. _____ is the default end-of-file character.

   (A) ^D   **(B)** ^E
   (C) ^P   **(D)** None of these

c. When we open an existing file or create a new file, the kernel returns a ____ to the process.

   (A) File-ID   **(B)** Create-ID
   (C) File descriptor   **(D)** Process-ID

d. The access time and the modification time of a file can be changed with the _____ function.

   (A) utime   **(B)** ctime
   (C) ftime   **(D)** none of these

e. To enable buffering, buf must point to a buffer of length BUFSIZ, a constant defined in _____.

   (A) <conio.h>   **(B)** <file.h>
   (C) <stdio.h>   **(D)** none of these

f. Which of the following is not correct?

   (A) By default, the stream that is opened is fully buffered, unless it refers to a terminal device, in which case it is line buffered.
   (B) An open stream is closed by calling fexit.
   (C) The freopen function opens a specified file on a specified stream, closing the stream first if it is already open.
   (D) The fopen function opens a specified file.

g. _____ remove the semaphore set from the system.

   (A) IPC_RMID   **(B)** SETALL
   (C) IPC_STAT   **(D)** IPC_exit

h. Which of the following is not true for Daemons?

   (A) Daemons are processes that live for a long time.
   (B) They are often started when the system is bootstrapped and terminate only when the system is shut down.
   (C) UNIX systems have numerous daemons that perform day-to-day activities.
   (D) They have a controlling terminal.

i. _____ is the abort signal that is generated when a process calls the abort function.

   (A) SIGABRT   **(B)** SIGEND
   (C) ABORT   **(D)** None of these

j. Unix Operating System is an _____.

   (A) Time Sharing Operating System   **(B)** Multi-User Operating System
   (C) Multi-tasking Operating System   **(D)** All of these

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

Q.2   a. Draw the architecture of UNIX operating system. Explain the functionality of each component.   **(10)**

   b. Explain the concept of system calls and library functions.   **(6)**

Q.3   a. What is the purpose of stat, fstat and lstat functions? Briefly explain each.   **(6)**

   b. Explain the usage of sticky bit and symbolic links in UNIX.   **(5)**

   c. Explain file access permission groups and permission types.   **(5)**

Q.4   a.   How would you use the fsync function with standard I/O stream?   **(3)**

     b.   Describe three ways to position a standard I/O stream.   **(9)**

     c.   Explain buffering techniques in standard I/O library.   **(4)**

Q.5   a.   Briefly explain the following functions: waitid, wait3, wait4.   **(6)**

     b.   Describe three reasons for use of interpreter files in UNIX.   **(5)**

     c.   Explain various functions that set user IDs for the following:- (**ANY TWO) (5)**
       (i)   Real user ID
       (ii) Effective user ID
       (iii) Write a program that prints real and effective user IDs.

Q.6   a.   Mention three ways for a process to terminate:-
       (i)   Normally
       (ii) Abnormally   **(6)**

     b.   Differentiate between :
       (i) setjmp and longjmp functions
       (ii)getrlimit and setrlimit functions   **(3+3)**

     c.   Explain the features of orphaned process groups.   **(4)**

Q.7   a.   Explain Daemon Process? Give its characteristics.   **(10)**

     b.   What are the three options available to us when a signal occurs?   **(6)**

Q.8   a.   List any five Reentrant functions that may be called from a signal handler. **(5)**

     b.   Explain features of job control signals.   **(5)**

     c.   Briefly explain the canonical and non canonical modes of input processing. **(6)**

Q.9   a.   What are the limitations of pipes? Mention the rules when one end of pipe is closed.   **(6)**

     b.   Explain the following: **(5+5)**
       (i)   Message queues
       (ii) Shared memory