

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. If the process time is stored as a signed 32-bit integer, and if the system counts 100 ticks per second, after how many days (approximately) will the value overflow?

- (A) 248 (B) 512
(C) 128 (D) None of the above

b. Data is read from an open file with the read function. If the read is successful, the number of bytes read is returned. If the end of file is encountered, _____ is returned.

- (A) 1 (B) -1
(C) 0 (D) None of the above

c. *tempnam* restrict the *prefix* to _____ characters

- (A) 6 (B) 4
(C) 5 (D) None of the above

d. The shells process their command lines _____

- (A) from right to left (B) from left to right
(C) Both (A) & (B) (D) None of the above

e. On an Intel x86 system under both FreeBSD and Linux, if we execute the program that prints “hello world” and do not call *exit* or *return*, the termination status of the program, which we can examine with the shell is _____

- (A) 15 (B) 14
(C) 12 (D) 13

Code: AC71/AT71 Subject: UNIX SYSTEMS PROGRAMMING

- f. File descriptors 2, 1 and 0 can be replaced in POSIX-compliant applications with symbolic constants:
- (A) STDIN_FILENO, STDOUT_FILENO, STDERR_FILENO respectively
 - (B) STDOUT_FILENO, STDIN_FILENO, STDERR_FILENO respectively
 - (C) STDERR_FILENO, STDIN_FILENO, STDOUT_FILENO respectively
 - (D) STDERR_FILENO, STDOUT_FILENO, STDIN_FILENO respectively
- g. In UNIX system terminology, a process that has terminated, but whose parent has not yet waited for it, is called
- (A) abort
 - (B) quit
 - (C) null
 - (D) zombie
- h. The fastest form of IPC is
- (A) shared memory
 - (B) pipes
 - (C) named pipes
 - (D) semaphores
- i. An existing process can create a new one by calling the _____ function.
- (A) fork
 - (B) exit
 - (C) wait
 - (D) invoke
- j. The _____ function is the catchall for I/O operations.
- (A) fsync
 - (B) fcntl
 - (C) ioctl
 - (D) fdatasync

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

- Q.2** a. If the calendar time is stored as a signed 32-bit integer, in what year will it overflow? What ways can be used to extend the overflow point? Are they compatible with existing applications? (8)
- b. The Bourne shell, Bourne-again shell, and Korn shell notation
digit1 >&digit2
means to redirect descriptor *digit1* to the same file as descriptor *digit2*. What is the difference between the two commands
./a.out > outfile 2>&1
./a.out 2>&1 > outfile (8)
- Q.3** a. What happens if the file mode creation mask is set to 777 (octal)? Verify the results using your shell's *umask* command. (4)

Code: AC71/AT71 Subject: UNIX SYSTEMS PROGRAM

```

    }
    static void
    sig_int (int signo)
    {
        int          i, j;
        volatile int  k;

        printf (“\nsig_int starting\n”);
        for ( i = 0 ; i < 300000; i++ )
        for ( j = 0 ; j < 4000 ; j++ )
            k += i * j;
        printf ( “sig_int finished \n”);
    }

```

- Q.8** a. The PARODD flag in the *c_cflag* field allows us to specify even or odd parity. The BSD tip program, however, also allows the parity bit to be 0 or 1. How does it do this? (8)
- b. If your system’s *stty(1)* command outputs the MIN and TIME values, do the following exercise: Log in to the system twice and start the *vi* editor from one login. Use the *sty* command from your other login to determine what values *vi* sets MIN and TIME to. Explain the output. (8)
- Q.9** a. The rationale for POSIX.1 gives as one of the reasons for adding the *waitpid* function that most pre-POSIX.1 systems can’t handle the following: (6)

```

if ((fp = popen("/bin/true", "r")) == NULL)
    ...
if((rc = system("sleep 100")) == -1)
    ...
if(pclose(fp) == -1)
    ...

```

What happens in this code if *waitpid* isn’t available and *wait* is used instead?

- b. Explain how *select* and *poll* handle an input descriptor that is a pipe, when the pipe is closed. (10)