ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION   SUMMER SEMESTER, 2016-2017
DURATION: 1 Hour 30 Minutes   FULL MARKS: 75

CSE 4603: UNIX Programming

Programmable calculators are not allowed. Do not write anything on the question paper.
There are **4 (four)** questions. Answer any **3 (three)** of them.
Figures in the right margin indicate marks.

1. a) Consult the files in Table 1 and answer the following questions using UNIX commands: 6×2

Table 1: Code for Question 1(a)

Filename: customer.h	Filename: employee.h	Filename: manager.h

#include "employee.h"
#include "manager.h"
class customer{
private: manager m;
/*These   are   public
methods*/
public:
    employee(){
      int i=10;
    }
    ~employee(){   }
}
	#include "manager.h"
	class employee{
	
	private:
	
	public:
	    customer(){
	    }
	    ~customer(){
	    {
	}
		#include "customer.h"
		class manager{
		//These are private
		private: customer c;
		public:
		    manager(){
		    }
		    ~manager(){
		      char j;
		      j='9';
		    }
		}

    i. Display the lines with 'Preprocessor Directives' with their filename and line number.
    ii. Display only the file names that do not have any comment in it.
    iii. Display the word counts in each of these files.
    iv. Display the lines where an assignment operation is performed.
    v. Change the file permission so that only the users in the same group as the user can execute the files.
    vi. Sort these files according to their file names.

  b) Why are there so many utilities in Unix and Unix like systems that do only one thing and one thing perfectly? What is the main philosophy behind making Unix that lets the users perform complex tasks with such simple utilities?   2+4

  c) What are the major differences between Unix and Linux?   7

2. a) Write short notes on the following commands: su, passwd, ls, cat, cp, mv, rm, cd, group, pwd, chgrp, chmod.   1×12

  b) When a process executes, it has four values related to file permissions: a real user ID, an effective user ID, a real group ID and an effective group ID. With proper example, describe how file access permission is arbitrated when a process is run.   8

  c) How do Read, Write and Execute permission differs in a regular file, a directory and an executable file?   5

3. a) Details of some files are given below:

Table 2: list of files in 'buetcse' home

```
buetcse@localhost:~$ ls -l /home/buetcse
-r-x------ 1 buetcse  buet  38 August   11 13:36 file1
-----r-x--- 1 cuetcse  cuet 460 August   11 15:53 file2
-rw-rw-r-- 1 bueteee  buet  37 August   11 14:24 file3
-rw-rw-r-- 1 bueteee  cuet  93 August   11 16:13 file4
dr-x---r-x 2 cuet    cuet 4096 August  16 12:42 dir1
dr-x---r-x 2 buet    buet 4096 August  16 12:44 dir2
```

Write commands to complete the following tasks:

i. Create three new users 'iut', 'iutcse' and 'iuteee'
ii. Create a new group 'iut'
iii. Add 'iut', 'iutcse' and 'iuteee' to the groups 'iut'
iv. Give 'iut', 'iutcse' and 'iuteee' users the 'sudo' privilege
v. Change active user to iut and create directory 'dir3'
vi. Change the files' owners owned by 'cuetcse' to 'iutcse' and change the group to 'iut'
vii. Change the files' owners owned by 'cueteee' to 'iuteee' and change the group to 'iut'
viii. Login as 'buetcse' and change the file1's permission so that only 'buet' group members can read or execute the file. Do the same for file3. Revoke all other permissions for those two files.
ix. Login as the owner of dir3 and change the permission of dir3 so that only the owner of the dir3 can list the contents of the directory and also enter into the directory. The group members should list the contents of dir3 but cannot enter. The rest of the users should not be able to do either.
x. What would be the final situation if now we give the command 'ls -l'?

b) Give an example showing the difference between lazy and greedy search in Regular Expression. Which one of these searches do 'grep' supports?   5

4. a) The ".csv" files in Table 3 have results of students in four different semesters.   3×5

Table 3: Results of student of four different semesters

second_semester.csv	fourth_semester.csv	sixth_semester.csv	eight_semester.csv
id; name; cgpa; grade	id; name; cgpa; grade	id; name; cgpa; grade	id; name; cgpa; grade
21; sa; 3.64; B	41; fa; 3.94; A+	61; ssa; 3.24; B	81; ea; 2.64; C
22; sb; 3.85; A	42; fb; 2.85; C	62; ssb; 3.45; B	82; eb; 3.85; A
23; sc; 3.59; B	43; fc; 3.55; B	63; ssc; 3.69; B	83; ec; 3.50; B
24; sd; 2.00; D	44; fd; 3.00; B	64; ssd; 4.00; A+	84; ed; 2.00; C
25; se; 1.50; F	45; fe; 2.50; D	65; sse; 1.50; F	85; ee; 4.00; A+

The columns of each result sheet are separated by a semi-colon (;). Now use 'awk' script to answer the following questions:

i. Write an 'awk' script that takes any number of result sheets in this format as input and and calculates the average cgpa for each semester.
ii. What percentage of the students gets an A+ in all the semesters? What percentage of them fails?
iii. How many students are present in each semester?

b) Consider the following html code segment: 10

Table 4: Code segment for question 4(b)

```html
<html>
  <h1>
    Hello World
  </h1>
</html>
```

Write 'egrep' command to print the lines with html tags.