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

MID SEMESTER EXAMINATION   SUMMER SEMESTER, 2017-2018

DURATION: 1 Hour 30 Minutes   FULL MARKS: 75

CSE 4673: Operating System and System 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.

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1. a) What is interrupt handling? Draw a picture of a sample interrupt timeline to explain the process.   10

   b) Draw the storage-device hierarchy and show how storages change in speed, cost and volatility in the hierarchy.   9

   c) What are the differences between virtualization and emulation? Provide appropriate examples.   6

2. a) With the help of figures, explain how MS-DOS layer structure works.   8

   b) Show how FreeBSD runs multiple programs.   7

   c) With figures describe the API-System Call- OS relationship.   10

3. a) With figures explain the states a process go through from creation to termination.   8

   b) What happens when you execute the following C++ code: 8

```
#include <sys/types.h>
int main(){
pid t pid;
        /* fork a child process */
        pid = fork();
        if (pid < 0) { /* error occurred */
        fprintf(stderr, "Fork Failed");
        return 1;
        }
        else if (pid == 0) {   /* child process */
        execlp("/bin/ls","ls",NULL);
        }
        else { /* parent process */
        /* parent will wait for the child to complete */
         wait(NULL);
        printf("Child Complete");
        }
         return 0;
        }
```

Figure 1: C++ code

   c) Give an example of an application that uses multiprocess architecture. Explain how multiple processes are created and maintained in that application.   9

4. a) With the help of pictures, show how parameters are passed during system calls.   4

   b) What is cloud computing? What are the various kinds of cloud computing environments that are available in general? With the help of pictures describe the functionalities of various parts in a cloud computing architecture.   13

   c) With the help of pictures, show an example when there would be a transition from user to kernel mode.   8