University of Sargodha

BS 5th Term Examination 2017.

Subject: Computer Science **Paper: Operating System (CMP: 3621)**

Time Allowed: 2:30 Hours **Maximum Marks: 80**

Note: Objective part is compulsory. Attempt any four questions from subjective part.

Objective Part (Compulsory)

Q.1. Write short answers of the following in 2-3 lines each on your answer sheet. (2*16)

A) What is system call to create child process?
B) Process Control Block
C) Race Conditions
D) Define demand paging.
E) Busy waiting
F) Define file system
G) user mode and kernel mode
H) List four conditions for deadlock.
I) Text segment and data segment
J) What are the various types of fragmentation?
K) Define two phase locking.
L) Mutual exclusion
M) What is demand paging?
N) Context Switching
O) Mention any four file attributes.
P) Explain the terms: Waiting time, Turnaround time.

Subjective Part

Q.2. (a) List and discuss various services provided by the operating system. (8)
(b) Compare batch operating systems and time sharing operating systems. (4)

Q.3. Write a note on the following with block code. (I) Synchronization Hardware (II) Semaphore (III) Monitor. (12)

Q.4. Consider the deadlock situation that could occur in the dining philosophers problem when the philosophers obtain the chopsticks one at a time. Discuss how the four necessary conditions for deadlock indeed hold in this setting. Discuss how deadlocks could be avoided by eliminating any one of the four conditions. (12)

Q.5. Compare the main memory organization schemes of contiguous memory allocation, pure segmentation, and pure paging with respect to the following issues: (12)
i. external fragmentation ii. internal fragmentation iii. ability to share code across processes

Q.6. (a) What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem? (6)
(b) Define and explain: (a) Inverted Page Table (b) Translation Look Aside Buffer. (6)

Q.7. (a) What is the purpose of using a "salt" along with the user-provided password? Where should the "salt" be stored, and how should it be used? (6)
(b) An experimental addition to UNIX allows a user to connect a watchdog program to a file. The watchdog is invoked whenever a program requests access to the file. The watchdog then either grants or denies access to the file. Discuss two pros and two cons of using watchdogs for security. (6)
