Exam #2

CSE 3320.002

Spring 2017

Name: _____

UTA ID:_____

"I certify that the following work is my work alone and I will follow the highest standards of integrity and uphold the spirit of the Honor Code"

Signature:_____

Directions: This is a closed book, closed notes exam. You may use a hand written 3x5 note card with notes. Please answer the questions briefly. Complete sentences are not necessary. Write your answers legibly. Unreadable answers will be counted wrong. There is a powers of 2 table on the last page.

1. [9pts] Given a file system that uses inodes to represent files. Disk blocks are 4 KB in size, and 16 bit pointers. This file system's index nodes have 10 direct disk blocks, as well as 4 indirect disk blocks and 3 double indirect block. What is the largest file that can be held using this inode layout?

2. [8pts] Explain the differences between deadlock and starvation.

3. [9pts] Explain the disk allocation schemes we discussed. Make sure to explain if they suffer from external fragmentation and if they support random access.

4. [8pts] How much cylinder skew is needed for a 5400-RPM disk with a track-to-track seek time of 2 msec? The disk has 500 sectors of 512 bytes each on each track

5. [8pts] Given the following request queue -- 8, 17, 4, 76, 42, 20 90, 41, 94, 97 with the disk head initially at the track 50 initially moving in the negative direction (towards 0). The beginning of the disk at 0 and the end of the disk is at 100. Calculate the travel time for the C-LOOK algorithm. Assume all reads are made in the negative direction if applicable.

6. [8pts] List the two schemes we discussed for tracking free disk blocks. Give an advantage of each.

7. [6pts] What are de facto and de jure standards?

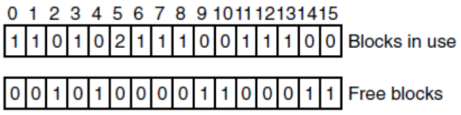
8. [8pts] Give two weaknesses of memory mapped I/O.

9. [8pts] List the four types of buffering we discussed with I/O software

10. [6pts] Describe the structure of the low level formatting applied to sectors. (3 parts).

11. [8pts] Describe two disadvantages of using variable length in-line file names in the directory structure

12. [7pts] When performing a file system consistency check, the following occurred. How would you correct it?



13. [7 pts] What feature of the ISO 9660 disk format was designed to allow for its use on the widest array of hardware?

Bonus [5 points a piece]:

A. For Linux device drivers what is the purpose of the file_operations structure?

B. What is the purpose of the ioctl() system call?

A

n	2^n	n	2^n	n	2^n
0	1	11	2,048	22	4,194,304
1	2	12	4,096	23	8,388,608
2	4	13	8,192	24	16,777,216
3	8	14	16,384	25	33,554,432
4	16	15	32,768	26	67,108,864
5	32	16	65,536	27	134,217,728
6	64	17	131,072	28	268,435,456
7	128	18	262,144	29	536,870,912
8	256	19	524,288	30	1,073,741,824
9	512	20	1,048,576	31	2,147,483,648
10	1,024	21	2,097,152	32	4,254,967,296