JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

UNIVERSITY UNDERGRADUATE EXAMINATIONS

3RD YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: IIS 3316

COURSE TITLE: DATA MANAGEMENT

EXAM VENUE: **STREAM:** BIS

DATE: **EXAM SESSION:**

TIME: 2.00 HOURS

INSTRUCTIONS:

1. **Answer Question 1 (Compulsory) and ANY other two questions**
2. **Candidates are advised not to write on the question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE: (30 MARKS)

1. Outline two reasons why information cannot be stored in memory {4 Marks}
2. Discuss the following terms as used in file management clearly detailing the pros and cons of each.
   - a) Sorting {3 marks}
   - b) Indexing {3 marks}
   - c) Hashing {3 marks}

3. Briefly explain the functions of the following on a hard disk
   - a) Platter
   - b) Spindle
   - c) Motor
   - d) Track
   - e) Cylinder {10 marks}

4. Compute the time needed to read 10 consecutive blocks from the same track.
   Assume no interleaving. {4 marks}
   > Use:
   > s=16 msec
   > r=8.3msec
   > btt=0.8 msec
   > ebt=0.84 msec

5. Distinguish between the following {3 marks}
   - a) Block
   - b) Record
   - c) File

QUESTION TWO: (20 MARKS)

1. Differentiate between sorted and unsorted sequential files {4 Marks}
2. Outline the Algorithms for performing the following in a sequential file {10 Marks}
   - a) Fetch Next Record
   - b) Insert a New Record
   - c) Update a record
   - d) Delete a record
   - e) Reorganizing a file

3. Assume a pile file has 100,000 records in it. Bfr=5, and 25% of the records are marked as deleted. {6 Marks}
   - a) Find TF for this file.
   - b) Assume the file has been re-organized. Find TF again and compare with your answer before re-organizing the file.
        Use: s=16msec, r=8.3msec , ebt =0.84msec

QUESTION THREE: (20 MARKS)

Using examples illustrate the implementation of
1. Bubble sort   {5 marks}
2. Selection sort   {5 marks}
3. Quick sort   {5 marks}
4. Merge sort   {5 marks}

QUESTION FOUR: (20 MARKS)

1. A pile file contains 100,000 records of 256 bytes each. The block size is 2048 bytes. Besides, assume 25% deleted records are there in the pile file. The system administrator is asked to undelete 10 records. How can he undelete these records and how much time is needed for that. {10 Marks}
2. Suppose that we want to update 100 records in a sorted sequential file having 200,000 records, with Bkfr=5. The updates include the key field values therefore, the file will not be sorted after these updates. Design a solution for these updates and compute the total time necessary. {10 Marks}

   Use the following parameters:
   s time : 18 msec
   r time : 10 msec
   btt   : 0.12 msec
   ebt   : 0.15 msec

QUESTION FIVE :(20 MARKS)

1. How do hash functions work?   {4 marks}
2. How do you solve collision problems when using has functions   {4 marks}
3. Outline two main problems encountered with hashing   {4 marks}
4. Why is it important to share data (give 4 reasons)? Describe two ways in which this can be achieved   {8 marks}