United College of Engineering and Research, Allahabad

Department of Computer Science & Engineering

B.Tech CSE- V Semester

Set-5

Course Name: Database Management System   **AKTU Course Code:** KCS-501

Time: 60 Minutes   **Max. Marks: 30**

- **All Questions are compulsory.**
- **All Questions carry one mark.**

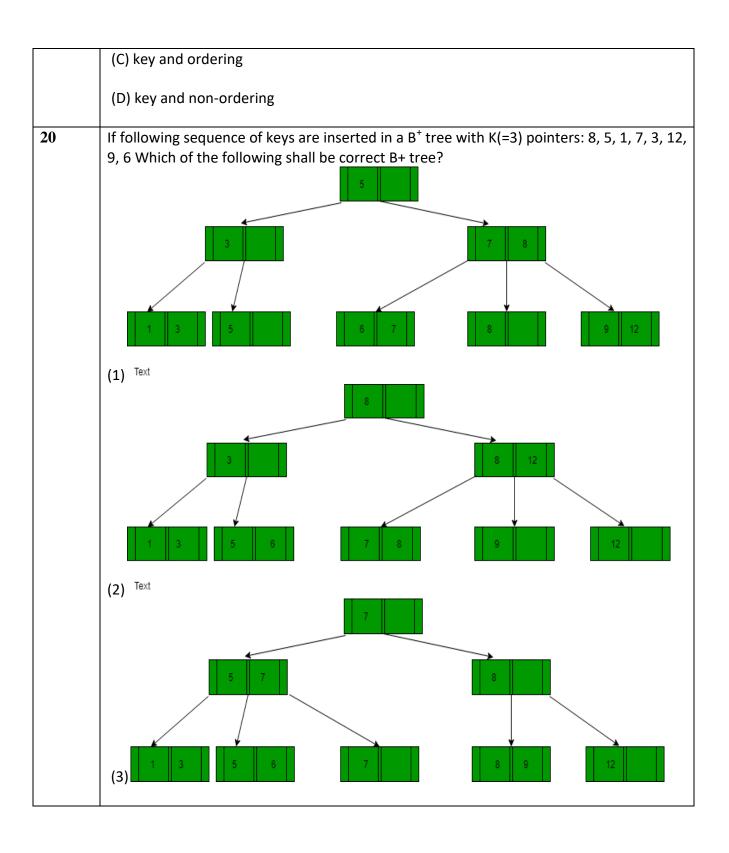| Q. No.	Questions
1	An index is clustered, if (A) it is on a set of fields that form a candidate key. (B) it is on a set of fields that include the primary key. (C) the data records of the file are organized in the same order as the data entries of the index. (D) the data records of the file are organized not in the same order as the data entries of the index.
2	Consider a B+-tree in which the maximum number of keys in a node is 5. What is the minimum number of keys in any non-root node? (A) 1 (B) 2 (C) 3 (D) 4

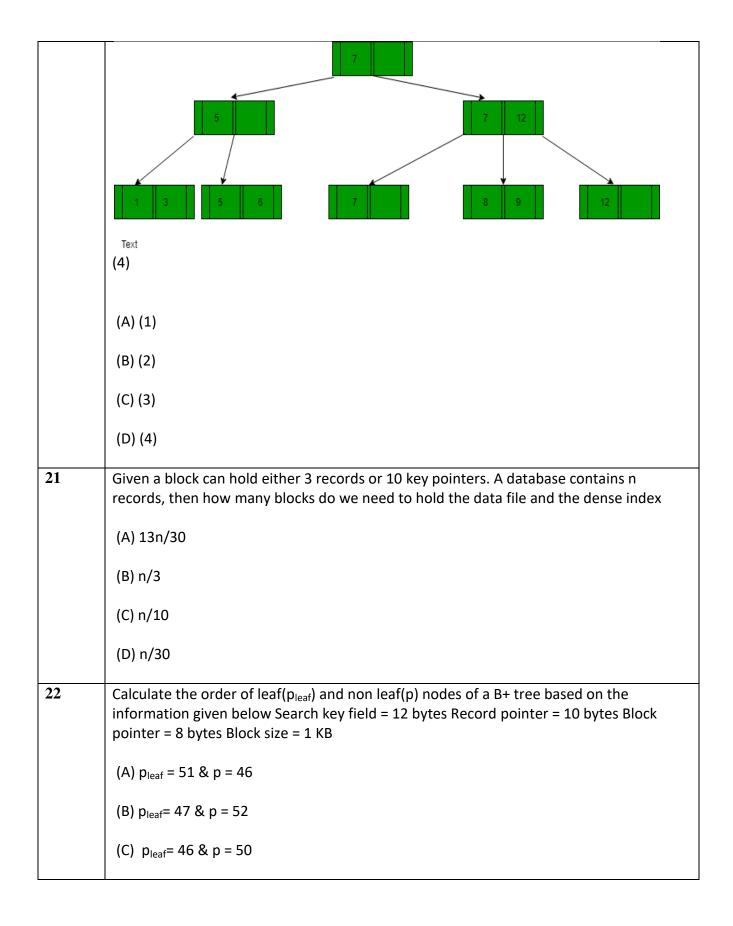|	
3	A clustering index is defined on the fields which are of type (A) non-key and ordering (B) non-key and non-ordering (C) key and ordering (D) key and non-ordering
4	A FAT (file allocation table) based file system is being used and the total overhead of each entry in the FAT is 4 bytes in size. Given a 100×10^6 bytes disk on which the file system is stored and data block size is 10^3 bytes, the maximum size of a file that can be stored on this disk in units of 10^6 bytes is _____. (A) 99.55 to 99.65 (B) 100.5 to 101.4 (C) 97.2 to 98.5 (D) 89.1 to 91.2
5	In the index allocation scheme of blocks to a file, the maximum possible size of the file depends on : (A) the size of the blocks, and the size of the address of the blocks. (B) the number of blocks used for the index, and the size of the blocks. (C) the size of the blocks, the number of blocks used for the index, and the size of the address of the blocks. (D) None of these
6	A file is organized so that the ordering of data records is the same as or close to the ordering of data entries in some index. Then that index is called (A) Dense (B) Sparse

	(C) Clustered (D) Unclustered
7	A database table T1 has 2000 records and occupies 80 disk blocks. Another table T2 has 400 records and occupies 20 disk blocks. These two tables have to be joined as per a specified join condition that needs to be evaluated for every pair of records from these two tables. The memory buffer space available can hold exactly one block of records for T1 and one block of records for T2 simultaneously at any point in time. No index is available on either table. If Nested-loop join algorithm is employed to perform the join, with the most appropriate choice of table to be used in outer loop, the number of block accesses required for reading the data are (A) 800000 (B) 40080 (C) 32020 (D) 100
8	A database table T1 has 2000 records and occupies 80 disk blocks. Another table T2 has 400 records and occupies 20 disk blocks. These two tables have to be joined as per a specified join condition that needs to be evaluated for every pair of records from these two tables. The memory buffer space available can hold exactly one block of records for T1 and one block of records for T2 simultaneously at any point in time. No index is available on either table. If, instead of Nested-loop join, Block nested-loop join is used, again with the most appropriate choice of table in the outer loop, the reduction in number of block accesses required for reading the data will be (A) 0 (B) 30400 (C) 38400 (D) 798400
9	Which of the following is correct? (A) B-trees are for storing data on disk and B+ trees are for main memory. (B) Range queries are faster on B+ trees.

	(C) B-trees are for primary indexes and B+ trees are for secondary indexes. (D) The height of a B+ tree is independent of the number of records.
10	There are 5 records in a database. Name Age Occupation Category Rama 27 CON A Abdul 22 ENG A Jeniffer 28 DOC B Maya 32 SER D Dev 24 MUS C There is an index file associated with this and it contain the values 1, 3, 2, 5 and 4. Which one of the fields is the index built form? (A) Age (B) Name (C) Occupation (D) Category
11	A B+ tree of order *d* is a tree in which each internal node has between *d* and *2d* key values. An internal node with *M* key values has *M+1* children. The root (if it is an internal node) has between *1* and *2d* key values. The distance of a node from the root is the length of the path from the root to the node. All leaves are at the same distance from the root. The height of the tree is the distance of a leaf from the root. a). What is the total number of key values in the internal nodes of a B+ tree with *l* leaves *(l≥2)*? b). What is the maximum number of internal nodes in a B+ tree of order 4 with 52 leaves? c). What is the minimum number of leaves in a B+ tree of order *d* and height *h(h≥1)*? **(A) a)**L+1 **b)**8 **c)**$2(d+1)^{h-1}$ **(B) a)**L-1 **b)**13 **c)**$2(d+1)^{h-1}$ **(C) a)**L-1 **b)**17 **c)**$2(d-1)^{h-1}$ **(D) a)**L-1 **b)**9 **c)**$2(d-1)^{h+1}$
12	In a B+ tree, if the search-key value is 12 bytes long, the block size is 1024 bytes and the block pointer is 6 bytes, then the maximum number of keys that can be accommodated in each non-leaf node of the tree is _____ . (A) 57 (B) 54

	(C) 58
	(D) 56
13	Consider a table that describes the customers : Customers(custid, name, gender, rating) The *rating* value is an integer in the range 1 to 5 and only two values (male and female) are recorded for gender. Consider the query "how many male customers have a rating of 5"? The best indexing mechanism appropriate for the query is (A) Linear hashing (B) Extendible hashing (C) B+ Tree (D) Bit-mapped hashing
14	Consider the following query : SELECT E.eno, COUNT(*) FROM Employees E GROUP BY E.eno If an index on *eno* is available, the query can be answered by scanning only the index if (A) the index is only hash and clustered (B) the index is only B+tree and clustered (C) index can be hash or B+ tree and clustered or non-clustered (D) index can be hash or B+ tree and clustered
15	Which of the following related to snowflake schema is true? (A) Each dimension is represented by a single dimensional table (B) Maintenance efforts are less (C) Dimension tables are normalised

	(D) It is not an extension of star schema
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17	Trigger is
	(A) Statement that enables to start any DBMS
	(B) Statement that is executed by the user when debugging an application program
	(C) The condition that the system tests for the validity of the database user
	(D) Statement that is executed automatically by the system as a side effect of a
	modification of the database
18	The order of a leaf node in a B+ tree is the maximum number of (value, data record pointer) pairs it can hold. Given that the block size is 1K bytes, data record pointer is 7 bytes long, the value field is 9 bytes long and a block pointer is 6 bytes long, what is the order of the leaf node?
	(A) 63
	(B) 64
	(C) 67
	(D) 68
19	A clustering index is defined on the fields which are of type
	(A) non-key and ordering
	(B) non-key and non-ordering

	(C) key and ordering
	(D) key and non-ordering
20	If following sequence of keys are inserted in a B$^+$ tree with K(=3) pointers: 8, 5, 1, 7, 3, 12, 9, 6 Which of the following shall be correct B+ tree? (1) Text (2) Text (3)

Text
(4)

(A) (1)

(B) (2)

(C) (3)

(D) (4)

21	Given a block can hold either 3 records or 10 key pointers. A database contains n records, then how many blocks do we need to hold the data file and the dense index (A) 13n/30 (B) n/3 (C) n/10 (D) n/30
22	Calculate the order of leaf(p_{leaf}) and non leaf(p) nodes of a B+ tree based on the information given below Search key field = 12 bytes Record pointer = 10 bytes Block pointer = 8 bytes Block size = 1 KB (A) p_{leaf} = 51 & p = 46 (B) p_{leaf}= 47 & p = 52 (C) p_{leaf}= 46 & p = 50

	(D) p_{leaf} = 52 & p = 47
23	The physical location of a record determined by a formula that transforms a file key into a record location is (A) Hashed file (B) B-Tree file (C) Indexed file (D) Sequential file
24	Embedded pointer provides (A) a secondary access path (B) a physical record key (C) an inverted index (D) a prime key
25	Database applications were built directly on top of file system to overcome the following drawbacks of using file-systems: **(i)** Data redundancy and inconsistency **(ii)** Difficulty in accessing Data **(iii)** Data isolation **(iv)** Integrity problems (A) (i) (B) (i) and (iv) (C) (i), (ii) and (iii) (D) (i), (ii), (iii) and (iv)
26	Raid configurations of the disks are used to provide (A) Fault-tolerance (B) High speed

	(C) High data density
	(D) A & B
27	In the indexed scheme of blocks to a file, the maximum possible size of the file depends on: (A) The number of blocks used for index and the size of index (B) Size of Blocks and size of Address (C) Size of index (D) Size of Block
28	In _____ allocation method for disk block allocation in a file system, insertion and deletion of blocks in a file is easy. (A) Index (B) Linked (C) Contiguous (D) Bit Map
29	Which of the following is dense index? (A) Primary index (B) Clusters index (C) Secondary index (D) Secondary non key index
30	A data file consisting of 1,50,000 student-records is stored on a hard disk with block size of 4096 bytes. The data file is sorted on the primary key RollNo. The size of a record pointer for this disk is 7 bytes. Each student-record has a candidate key attribute called ANum of size 12 bytes. Suppose an index file with records consisting of two fields, ANum value and the record pointer the corresponding student record, is built and stored on the same disk. Assume that the records of data file and index file are not split across disk blocks. The number of blocks in the index file is _____ .

	(A) 698
	(B) 898
	(C) 899
	(D) 4096

Answer

1-C	2-B	3-A	4-A	5-B	6-C	7- C	8-B	9-B	10-C
11-B	12-D	13-D	14-C	15-C	16-C	17-D	18-A	19-A	20-A
21-A	22-C	23-A	24-A	25-D	26-D	27-A	28-B	29-C	30-A