DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [IT]
SUBJECT: (IT502) DATABASE MANAGEMENT SYSTEM

Examination	:Second Sessional	Seat No.	:
Date	: 05/09/2018	Day	: Wednesday
Time	: 11.45 to 01:00	Max. Marks	: 36

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.   **[12]**

(a) If you are developing a database, what measures you should take to ensure accuracy of **[3]** data? *Note: Clearly state the measures taken and explain how.*

(b) What is meant by each of following terms: Access control, Audit trail, Database audit. **[3]**

(c) What are the main objectives of the File organization? Compare different file **[2]** organization techniques in database.

(d) Given a relation R(A, B, C, D, E, H) and having the following Fds F={A→ BC, **[2]** CD→E, E→C, D→AEH, ABH→BD, DH→BC}. Find the keys for relation R .

(e) What is the difference between Pipelining and Materialization query evaluation **[2]** technique?

Q.2 Answer *Any two* of the following questions.   **[12]**

(a) Consider Relation R, which has attributes that hold schedules of courses and sections at **[6]** a university; R={Course_no, Sec_no, Offering_dept, Credit_hours, Course_level, Instructor_ssn, Semester, Year, Days_hours, Room_no, No_of_students }. Suppose that the following functional dependencies hold on R:
{Course_no} → {Offering_dept, Credit_hours, Course_level}
{Course_no, Sec_no, Semester, Year} → {Instructor_ssn, Semester, Year, Days_hours, Room_no, No_of_students }
{Room_no, Days_hours, Semester, Year} → {Instructor_ssn, Course_no, Sec_no}.
Try to determine which sets of attributes form keys of R. How would you normalize relation to its highest normal form? *Note: Show Every step with proper explanation.*

(b) (I) Consider the following relation: **[3]**

TUPLE#	A	B	C
#1	10	b1	c1
#2	10	b2	c2
#3	11	b4	c1
#4	12	b3	c4
#5	13	b1	c1
#6	14	b3	c4

Table 2.1

What is functional and multi-value dependencies? Which of the functional dependencies may hold in the above relation(table) 2.1 ? If the dependencies cannot hold, explain why by specifying the tuples that cause the violation.
i. A→ B   ii. B→C   iii. C→B   iv. B→A   v. C→A   vi. AB→C

(II) Find the Irreducible set (canonical cover) of following set of functional dependency **[3]** set F. *Note: Show each and every step with proper explanation.*
F={AB→C, C→A, BD→D, ACD→B, BE→C, EC→FA, CF→BD, D→E}

(c) What is Assertion and Trigger mechanism in database? Explain clearly with example. **[6]**

Q.3 (a) Consider the Information in Table 3.1 and construct a B+ tree index using Age as search **[6]** key attribute where fan-out of node is 4. After creation, Delete information of Amir khan, Mithun Chakraborty and Amitabh Bachchan. *Note: Show each and every insertion and deletion properly.*

(b) Construct an Extendable Has Index for Table 3.1. Consider Age as a search key **[6]** attribute. Assume that one bucket can store maximum 2 keys at a time where a hash function is **H(Key) = Age % 7**. *Note: Show each and every step properly.*

OR

Q.3 (a) Consider the Information in Table 3.1 and construct a B-tree index using Age as search **[6]** key attribute where fan-out of node is 4. After creation, Delete information of Sunny Del, Akshay kumar and Ranbir Kapoor. *Note: Show each and every insertion and deletion properly.*

(b) (I) Consider the Information in Table 3.1 and answer the question. If we want to search **[3]** all the actor's age between 41 to 60. Which method of indexing is more suitable (Hint: Hash or B+ Tree or B Tree)? Justify your reason.

(II) List all the methods to represent variable length records? Explain Slotted Page **[3]** structure method.

Actor_ID	Actor_Name	Age
A001	Sunny Deol	55
A002	Shahrukh khan	35
A003	Ranbir Kapoor	22
A004	Hrithik Roshan	30
A005	Akshay kumar	33
A006	Salman Khan	45
A007	Mithun Chakraborty	60
A008	Rishi Kapoor	65
A009	Varun Dhavan	18
A010	Amir Khan	52
A011	Amitabh Bachchan	74
A012	Rajinikanth	70

Table 3.1