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| **UNITED COLLEGE OF ENGINEERING & RESEARCH, PRAYAGRAJ (010)** | | | | **Department of Computer Science and Engineering** | | | | |
| Second Sessional Examination (Odd Semester 2021-22) | | | | SEMESTER: V | | Date:- 15/12/2021 | | |
| TIME: 2 hours. | | | SUBJECT :DBMS | Paper code: KCS-501 | | MM. 30 | | |
| **READ ALL INSTRUCTIONS AND QUESTIONS VERY CAREFULLY** | | | | | | | | |
| **SECTION A (Attempt ALL questions) Very short answer** | | | | | **[10]** | | **CO** | **Bloom’s Taxonomy Level** |
| 1 | a | Explain Domain Constraints and Entity Integrity Constraints | | | [1] | | 2 | Understand (L2) |
| 1 | b | Define foreign key. | | | [1] | | 2 | Remember (L1) |
| 1 | c | Explain trigger and cursor used in database. | | | [1] | | 2 | Understand (L2) |
| 1 | d | Give an expression in the tuple relational calculus equivalent to the following: 𝜫A, F (𝝈C=D (r x s)) | | | [1] | | 2 | Apply (L3) |
| 1 | e | Write the difference between 3NF and BCNF. | | | [1] | | 3 | Understand (L2) (L2) |
| 1 | f | Define functional dependency. | | | [1] | | 3 | Remember (L1) |
| 1 | g | Define 4NF. | | | [1] | | 3 | Remember (L1) |
| 1 | h | Why do we normalize database? | | | [1] | | 3 | Understand (L2) |
| 1 | i | Define recoverable schedule. | | | [1] | | 4 | Remember (L1) |
| 1 | j | Define view serializability. | | | [1] | | 4 | Remember (L1) |
| **SECTION B (Attempt all questions) Short answer** | | | | | **[12]** | |  |  |
|  |  | **Attempt any two.** | | |  | |  |  |
| 2 | a | Suppliers( sid: integer, sname: string, address: string)  Parts(pid: integer, pname: string, color: string)  Catalog(sid: integer, pid: integer, cost: real)  Write the following queries in relational algebra..  (i) Find the sids of suppliers who supply some red part or are at 221 Packer Street.  (ii) Find the sids of suppliers who supply some red part and some green part.  (iii) Find the sids of suppliers who supply every red part. | | | [3] | | 2 | Analyze (L4) |
| 2 | b | Consider the following relations containing airline flight information:  Flights(no: integer, from: string, to: string, distance: integer, departs: time, arrives: time)  Aircraft(aid: integer, aname: string, cruisingrange: integer)  Certified(eid: integer, aid: integer)  Employees(eid: integer, ename: string, salary: integer)  Write the following queries in relational algebra.   1. Find the names of pilots who can operate some plane with a range greater than 3,000 miles but are not certified on any Boeing aircraft. 2. Find the eids of employees who make the second highest salary. 3. Find the aids of all aircraft that can be used on non-stop flights from Bonn to Madras. | | | [3] | | 2 | Analyze (L4) |
| 2 | c | Consider the following employee database:-  employee ( employee-name, street, city)  works (employee-name, company-name, salary)  company (company-name, city)  manages (employee-name, manager-name)  Write the following queries in SQL.   1. Find all employees in the database who live in the same cities as the companies for which they work. 2. Find all employees in the database who live in the same cities and on the same streets as do their managers. 3. Find the company that has the most employees. | | | [3] | | 2 | Analyze (L4) |
|  |  | **Attempt any two** | | |  | |  |  |
| 3 | a | Define Minimal Cover. Suppose a relation R (A,B,C) has FD set F = {A→B, B→C, A→C, AB→B, AB→C, AC→B} Convert this FD set into minimal cover. | | | [3] | | 3 | Apply (L3) |
| 3 | b | Consider R = (A, B, C, D, E, F, G, H) and F= { AB 🡪 C, BC 🡪 D, E 🡪 F, G 🡪 F, H 🡪 A, FG 🡪 H } Is the decomposition of R into R1(A, B, C, D), R2(A, B, C, E, F), R3(A, D, F, G, H) lossless? Is it dependency preserving? | | | [3] | | 3 | Apply (L3) |
| 3 | c | Consider R = (A, B, C, D, E) and F= { A 🡪 B, BC 🡪 E, ED 🡪 A } (a) List all the candidate keys for R. (b) Is R in third normal form? (c) Is R in BCNF? | | | [3] | | 3 | Analyze (L4) |
| **SECTION C (Attempt ANY ONE question) Long answer** | | | | | **[8]** | |  |  |
| 6 |  | 1. What do you understand by ACID properties of transaction ? Explain in details. 2. What do you mean by serializability? Discuss the conflict and view serialzability with example. Discuss the testing of serializability also. | | | [8] | | 4 | Apply (L3) |
| 7 |  | 1. What is transaction? Draw a state diagram of a transaction showing its state. And also explain each states. 2. Which of the following schedules are conflicts serializable? For each serializable schedule find the equivalent serial schedule.   S1: r1(x); r3(x); w3(x); w1(x); r2(x) S2: r3(x); r2(x); w3(x); r1(x); w1(x) S3: r1(x); r2(x); r3(y); w1(x); r2(z); r2(y); w2(y) | | | [8] | | 4 | Apply (L3) |

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| **Course Outcome Wise Marks Distribution** | CO1 | CO2 | CO3 | CO4 | CO5 |
|  | 10 | 10 | 10 |  |

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| **Bloom’s Taxonomy Wise Marks Distribution** | L1 | L2 | L3 | L4 | L5 | L6 |
| 5 | 4 | 23 | 12 |  |  |