KATHMANDU UNIVERSITY
End Semester Examination [C]
January, 2019

Marks Scored:

Level : B.E.
Year : II
Course : COMP 232
Semester: II

Exam Roll No. :
Time: 30 mins.
F.M. : 10

Registration No. :
Date JAN 0 1 2019

SECTION "A"
[20 Q.× 0.5 = 10 marks]

Pick the appropriate answer(s).

1. Double lines in a relationship set indicates _____
   [ ] identifying entity set linked to weak entity set
   [ ] total participation of an entity in an relationship set
   [ ] simply the relationship set
   [ ] link attribute of relationship set to relationship set

2. In a system where automatic lock based protocol mechanism is implemented ,when a transaction Ti issues a _____ operation, the system issues a lock-S(Q) instruction followed by the _____ instruction.
   [ ] Read(Q) and Read(Q)
   [ ] Read(Q) and Write(Q)
   [ ] Write(Q) and Read(Q)
   [ ] Write(Q) and Write(Q)

3. The function that an entity plays in a relationship is called that entity's _____
   [ ] participation [ ] role [ ] activities [ ] association

4. A failed transaction can transit to the abort state will accept the following operation except _____
   [ ] restart
   [ ] kill
   [ ] rollback
   [ ] partially committed

5. We say that I and J conflict iff
   [ ] They are operation by different transactions on the same data item and one of them instruction is write operation.
   [ ] They are operation by same transactions on the same data item and one of them instruction is write operation.
   [ ] They are operation by different transactions on the different data item and one of them instruction is write operation.
   [ ] They are operation by same transactions on the same data item and one of them instruction is read operation.

6. In _____ index an index entry appears for every search-key value in the file.
   [ ] sparse [ ] dense [ ] multilevel [ ] btree

7. A relation schema is in the third Normal form with respect to the set F of functional dependencies if, for all dependencies in F+ of the form $\alpha \rightarrow \beta$ where $\alpha \subseteq R$ and $\beta \subseteq R$ and at least one of the following holds except _____
[ ] $\alpha \rightarrow \beta$ is a trival functional dependency
[ ] α is also a super key for R
[ ] Each attribute A in $\beta - \alpha$ is contained in a candidate key for R
[ ] Single candidate key must contain all the attribute in $\beta - \alpha$

8. To include integrity constraint in a existing relation use :
[ ] Create table [ ] Modify table [ ] Alter table [ ] Drop table

9. Locks placed by command are called _____.
[ ] Implicit [ ] Explicit [ ] Shared [ ] Exclusive

10. For each attribute of a relation, there is a set of permitted values, called the _____ of that attribute.
[ ] Domain [ ] Relation [ ] Set [ ] Schema

11. The number of attributes in relation is called as it's.....
[ ] Cardinality [ ] Degree [ ] Tuple [ ] Entity

12. Data integrity constraints are used to:
[ ] Control who is allowed access to the data
[ ] Ensure that duplicate records are not entered into the table
[ ] Improve the quality of data entered for a specific property (i.e., table column)
[ ] Prevent users from changing the values stored in the table

13. ODBC stand for_____
[ ] Object database Connectivity [ ] Oral database Connectivity
[ ] Oracle Database Connectivity [ ] Open database Connectivity

14. In ordered indices the file containing the records is sequentially ordered, a _____ is an index whose search key also defines the sequential order of the file.
[ ] Clustered index [ ] Structured index
[ ] Unstructured index [ ] Nonclustered index

15. A _____ index, an index entry appears for only some of the search-key values.
[ ] Dense [ ] Sparse [ ] Straight [ ] Continuous

16. For every pair of transactions T_i and T_j, it appears to T_i that T_j finished execution before T_i started or T_j started execution after T_i finished. This property is held by the term _____.
[ ] Atomicity [ ] Consistency [ ] Isolation [ ] Durability

17. The _____ operation allows us to find tuples that are in one relation but are not in another.
[ ] Union [ ] Difference [ ] Rename [ ] Intersection

18. In a growing two phase locking protocol one of the following statements is always true.
[ ] A transaction may release locks but may not obtain any new locks.
[ ] A transaction may obtain locks but may not release any locks.
[ ] A transaction may obtain many locks and releases any locks.
[ ] A transaction may not obtain any new locks and may not release any locks.

19. The assignment operator is denoted by
[ ] -> [ ] <- [ ] = [ ] ==

20. The primary key for the binary relationship set can be chosen as the primary key of either entity set in
[ ] one to one relationship [ ] many to one relationship
[ ] one to many relationship [ ] many to many relationship

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Year : II
Time : 2 hrs. 30 mins.

Course : COMP 232
Semester: II
F.M. : 40

SECTION "B"
[2Q. × 8 = 16 marks]

Answer *ANY TWO* questions.

1. Describe the term data model. Represent the following scenario with a suitable data model.
An airline company wants to keep the track of the customers and their reservations, flights, and their status, seat assignments on the individual flights, and the schedule and routing of the future flights. For internal reporting it should reflect the tickets sale, year and the destination and also the employee information that does the best sale. Your model should include a complete description.

2. With the help of the relational schema below explain how the normalization of database tables reduces the redundancy.

Grade_report(StudNo,StudName,(Major,Adviser, (CourseNo,Ctitle,InstrucName, InstructLocn,Grade)))

Functional dependencies
StudNo -> StudName
CourseNo -> Ctitle,InstrucName
InstrucName -> InstrucLocn
StudNo,CourseNo,Major -> Grade
StudNo,Major -> Advisor
Advisor -> Major

3. Explain the working mechanism of database system internals with the neat and clear diagrams.

SECTION "C"
[6Q. × 4 = 24 marks]

Answer *ANY SIX* questions.

4. What is the significance of the Cartesian product operation? Explain its anomalous result with examples.

5. What is a Null value? Explain with example how do Null values are treated by aggregation function in SQL.

6. Explain the anomalies and its solution that arise with the concurrent access of the database system with examples.

7. Define integrity problem in maintaining record in file system? Explain how DBMS resolves this issue.

8. What are the different parameters upon which the indexing mechanism can be judged? Explain the significance of one parameter versus another.

9. What do you mean by serial schedule? Explain the importance of serialization in the concurrent database system.

10. With the help of the schema describe below express the query(a ,b) in SQL form.

Instructor(ID,name.dept_name,salary)
Section(course_id,section_id,semester,year,building,room_num,time_slot_in)

a. Give a 5 percent salary raise to the instructors whose salary is less than average salary.
b. Find all the courses taught in the fall 2012 semester but not in spring 2013 semester