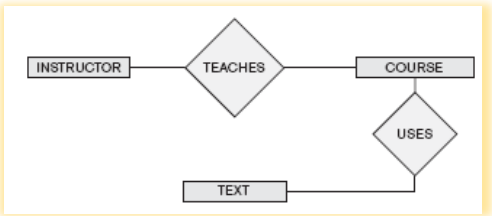
NATIONAL INSTITUTE OF TECHNOLOGY KURUKSHETRA

Computer Engineering Department

BTech(CS), CSPC-25/Database System, Mid Term-I Exam

Duration: 50 Minutes **Date:** 07.09.2021

Maximum Marks: 15 **Roll No**: _ _ _ _ _ _

Q. 1.	Answer the following (**briefly**) **(a)** What is the relationship between '*Data*' with '*Information*'? **(b)** Why mappings between 'level's are required in '*Three-schema architecture*' for the DB design? **(c)** How to the map a '*Weak*' entity in the logical schema, explain with a suitable example. **(d)** What is the '*property of Uniqueness,* and how both '*Primary key'* & '*Foreign key'* help in the implementation of the property? **(e)** How concept of *generalization* and *specialization* help in the DB design?	(1*5)
Q. 2	**(a)** Composite and multi-valued attributes can be nested to any number of levels. Suppose we want to design an attribute for a STUDENT entity type to keep track of previous college education. Such an attribute will have one entry for each college previously attended, and each such entry will be composed of Institute name, degree_st_dt and degree_end_dt, degree entries (degrees awarded at that college, if any), and transcript entries (courses completed at that college, if any). Each degree entry contains the degree name and the month and year the degree was awarded, and each transcript entry contains a course name, semester, year, and grade. **Design an attribute to hold this information, also describe the primary key constraints for the entity of this attribute**. (*State clearly any additional assumptions you make).* **(b)** Consider the below ER diagram. Assume that a course must use a textbook, as a text by definition is a book that is used in some course. A course may not use more than ten books. Instructors teach from two to three courses. ***Supply (min, max) constraints on this diagram***. *State clearly any additional assumptions you make.* If we add the relationship ADOPTS, to indicate the textbook(s) that an instructor uses for a course, should it be a binary relationship between INSTRUCTOR and TEXT, or a ternary relationship between all three entity types***? What (min, max) constraints would you put on it? Justify?*** 	(2,3)
Q. 3	Design a database for an automobile company to prove to its dealers to assist them in maintaining customer records and dealer inventory and to assist sales staff in ordering cars. Each vehicle is identified by a vehicle identification number (VIN). Each individual vehicle is particular model of a particular brand offered by the company (e.g., the *xf* is model of the car brand *Jaguar* of *Tata Motors*). Each model can be offered with a variety of options, but an individual car may have two to ten available options. The database needs to store the information about models, brands, and options, as well as information about individual dealers, customers, and cars. Considering that a dealer must buy at least a car of the same brand, may sell at most four brands with two to five models of each brands. **(a)** Draw an *ERD* for the above data requirements, with appropriate entities (strong, weak), attributes (*PK, derived, multi*), relationships and relationship cardinalities (Min, Max). **(b)** Create equivalent '*logical schema*', with suitable constraints. Also create valid few tuple/records.	(2,3)

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