Birla Institute of Technology & Science, Pilani
Hyderabad Campus

Mid-Semester Test

Course No.	**: CSF212**	**Course Title**	**: Database Systems**
Nature of Exam	**: Closed Book**	**Weightage**	**: 25%**
Duration	**: 90 Minutes**	**Max Marks:**	**: 25**
Date	**: 05-03-2018**	**Time**	**: 11-12:30 PM**

Note: Attempt all questions with proper justification.
Assume missing data, if any, suitably.

1. **Answer each of the following questions briefly. The questions are based on the following relational schema:** **(5 Marks)**

Emp (eid: number, ename: string, age: number, salary: real)
Works (eid: number, dno: number, work_load_time: time)
Dept (dno: number, dname: string, budget: real, managerid: number)

I. Identify foreign key(s) in these relations.
II. Write the SQL statements to create Works and Dept tables including appropriate versions of all primary and foreign key integrity constraints. In Dept relation every department is guaranteed to have a manager.
III. Display Department name(s) having number of employees more than 60.
IV. Display employee information with total work load time.
V. Get employee information whose work_load is more than average workload of the department.

2. **Given the following instance of Student Table:** **(2 Marks)**

SID	Sname	Email	Age	CGPA
PS0064H	Mohit	Mohit@bits.ac.in	17	9.1
PS0119H	Jitesh	Jitesh@bits.ac.in	18	8.9
PS0120H	Shubham	Ravi@bits.ac.in	19	9.3
PS0093H	Abhishek	Abhishek@bits.ac.in	18	9.23
PS0085H	Shubham	Ravi1@bits.ac.in	17	8.79
PS0019H	Abhishek	Abhishek1@bits.ac.in	18	8.90

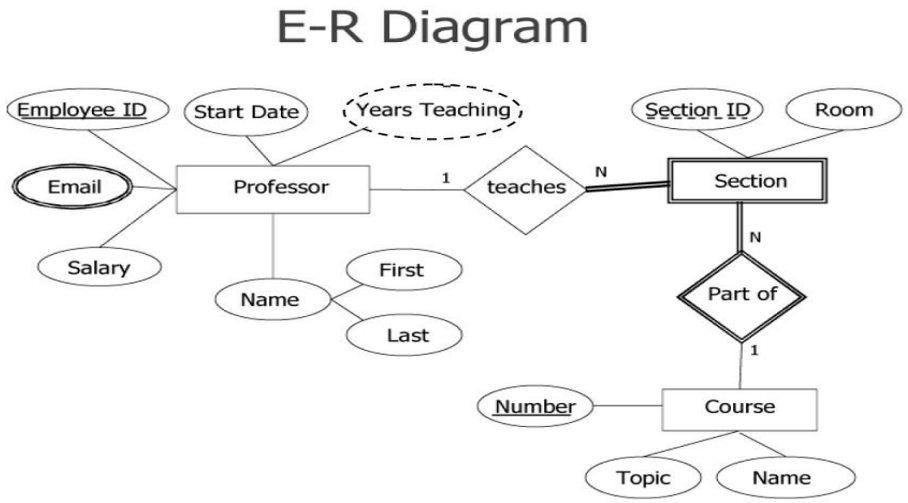
I. Identify any five super keys in this relation. Justify your answer.
II. Identify all the correct candidate keys and primary key for the above relation along with proper justification.

---------- P.T.O. ----------

3. **Find the minimal cover of the set of functional dependencies given; {A → AC, AB → BC, C → DI, CD → I, EC → ACB, EI → C}** **(2 Marks)**
4. **Relation R has four attributes ABCD. Fields of R contain only atomic values. F = {A -> B, B -> C, C->BD} is a set of functional dependencies (FDs).** **(2 Marks)**
   I. What are the candidate keys of R?
   II. What is the highest normal form of this relation scheme?
5. **Suppose you are given the following requirements for a simple database for the Indian Premier League (IPL):** **(6 Marks)**

   I. the IPL has many teams,
   II. each player belong to only one team,
   III. each IPL team has a name, a city, a coach, a captain, and a set of players,
   IV. each player has a name, a position, a Playing role (Batsman, bowler, All-Rounder)
   V. a game is played between two teams and has a date (such as May 12th, 2018), wining team name, and a score (100 runs or 4 wickets).

   a. **Construct a ER diagram for the IPL database. List your assumptions and clearly indicate the cardinality mappings.**
   b. **Find the minimum number of tables needed to present above ER diagram.**
6. **Relation has eight attributes ABCDEFGH. Fields of R contain only atomic values. F = {CH -> G, A -> BC, B->CFH, E->A, F->EG} is a set of functional dependencies (FDs).** **(4 Marks)**
   I. If relation is not in 3NF then decompose this relation to make 3NF.
   II. If relation is not in BCNF then decompose this relation to make BCNF.
   III. Find whether decomposition is Lossless or Lossy?
   IV. Check whether the decomposition is preserving dependency or not ?
7. **Consider the following ER-diagram:** **(2 Marks)**



How many minimum relations required for the above diagram? Justify your answer.

8. **Explain difference between** **(2 Marks)**
   I. Relational Model, Entity-Relationship Model, and Object-Based Data Model.
   II. Single valued Attributes, Multi valued Attributes, Composite Attribute, and Derived Attribute.

***********ALL THE BEST!! ***************