Data Base Management   COMP
Systems — S.E. Sem —IV (CBGS) June 2014.

QP Code : NP-19797

(3 Hours)   [Total Marks : 80

N.B. : (1) Question No. 1 is **compulsory**.
      (2) Solve any **three** questions from the **remaining** questions.
      (3) Make **suitable** assumptions if **needed**.

1. (a) List four significant differences between file processing system and database   5
management system.
    (b) Explain shadow page recovery.   5
    (c) Explain the terms . total participation' and . partial participation' with example.   5
    (d) Explain lossless join decomposition and dependency preserving decomposition.   5

2. (a) Explain conflict serializability and view serializability with examples.   10
    (b) Construct an ER diagram and relational model for hospital with a set of patients   10
and a set of medical doctors. Patients are treated in a single ward by the doctors
assigned to them. Each patient will be treated by a single doctor. Healthcare assistants
also attend to the patients, a number of these are associated with each ward. Patient
undergoes various tests. Accounts department manages patient treatment bill and
staff payment. Some staff are paid part time and doctors and care assistants work
varying amounts of overtime at varying rates (subject to grade).

3. (a) What is an attribute ? Explain different types of attributes with examples.   10
    (b) Write SQL queries for the given database.   10
Sailor(sid, sname,rating,age)
Boat(bid, bname, color)
Reserves(sid, bid,date)
     (i) Find the names of sailors who have reserved 'red' boat.
     (ii) Find the sailor (name) with highest rating.
     (iii) Find the average age of sailor.
     (iv) Find the age of youngest sailor for each rating level.
     (v) Add the new boat to the database. Assume any values for required attributes.

4. (a) Explain the term super key, primary key, candidate key and foreign key giving   10
suitable examples.
    (b) What is normalization ? Explain 1NF, 2 NF, 3NF, BCNF with suitable examples.   10

5. (a) Explain domain constraints and referential integrity constraints.   10
    (b) Explain sort-merge join algorithm in query processing.   10

6. (a) Explain following relational algebra operations with examples :—   10
     (i) set intersection.   (iii) Natural Join
     (ii) Generalized projection   (iv) Division operator
    (b) Describe the overall architecture of DBMS with suitable diagram   10

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Con. 13005-14.