

15 May, 2012

# MCA Sem-III (CBSGS) Database Management System

Q.P. Code :06703

27

[Time: 3 Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B:**
1. Q.11 is compulsory.
  2. Attempt any four from remaining six questions
  3. Answers to sub questions should be answered together.

- Q.1 a) Suppose you are given the following requirements for a simple database for the National Hockey League (NHL): 10
- i) The NHL has many teams,
  - ii) Each team has a name, a city, a coach, a captain, and a set of players,
  - iii) Each player belongs to only one team,
  - iv) Each player has a name, a position (such as left wing or goalie), a skill level, and a set of injury records,
  - v) A team captain is also a player,
  - vi) A game is played between two teams (referred to as host team and guest team) and has a date (such as May 11th, 2016) and a score (such as 4 to 2).
- Construct a clean and concise ER diagram for the NHL database.
- b) Create a relational Schema for the above E-R diagram and normalize till 3NF 10
- Q.2 a) Draw and explain various states of transaction in a database 08
- b) Explain the significance of Query Optimization 07
- Q.3 a) Explain how locking protocol can be used to control the concurrency in database? 08
- b) Explain lossless join decomposition and dependency preservation decomposition with the help of an example. 07
- Q.4 a) Explain the terms minimal cover and functional dependency 08
- For the relation R(A, B, C, D, E, F, G) following functional dependencies hold true
- $A \rightarrow B$   
 $BC \rightarrow DE$   
 $AEF \rightarrow G$
- Show that  $ACF \rightarrow DG$
- b) Explain Bell-La Padula model? Explain intuition behind two models? 07
- Q.5 a) Explain various deadlock detection and prevention techniques? 08
- b) Explain architecture of database system with the help of diagram? 07



- Q.6 a) Explain ARIES crash recovery in database.
- b) Explain the roles and responsibilities of DBA for managing database.

Q.7 Write short notes on any three

- a) Weak Entity and Strong Entity
- b) Shadow Paging
- c) Network Data Model
- d) Generalization and specialization