

**School of Information Technology
IIT Kharagpur**

Course Id: IT60107 Data Warehousing and Data Mining

Date: August 31, 2005

Total Time: 60 minutes

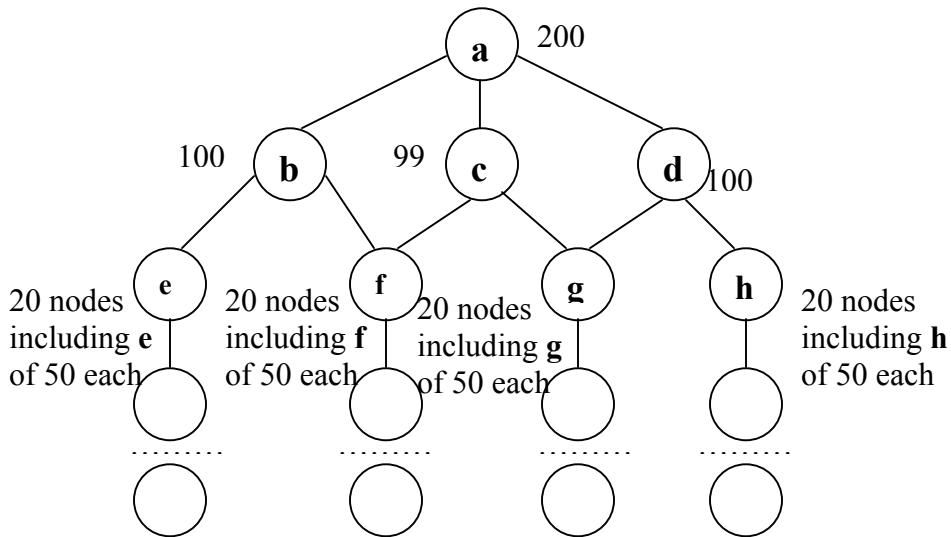
Max. Marks: 35

Instructions: Answer all questions. You may answer the questions in any order. However, all parts of the same question must be answered together. Clearly state any reasonable assumption you make.

1. Consider the following lattice of views along with a representation of the number of rows in each view where **a** is the base cuboid. You have to choose 2 other views to materialize apart from the base cuboid.

- (a) Suggest a greedy algorithm to solve the problem.
- (b) Using the greedy algorithm, show step by step which of the views you would choose.
- (c) What is the optimal choice of views to materialize for this lattice?

Assume that the cost of running a query is linearly proportional to the number of rows in the view from which it is run. [5+5+5=15]



2. A university plans to build a data warehouse that would help them in analyzing the performance of the students in various courses in different academic sessions. They want to analyze if there is any relation between the average grade of a course and the number of students attending it. They would also like to know if there were some courses offered but did not have any students registered for them. Relative performance among boys and girls and average grades of students from various states and cities of the country for each course must be analyzed for each course and also overall CGPA.

- (a) Design a star schema for such a data warehouse clearly identifying the fact table(s) and dimension table(s), their primary key(s) and foreign key(s). Your schema should at least be able to satisfy the above mentioned analysis requirements. You may consider other suitable attributes for the dimension table(s).
- (b) Write an SQL query that runs on your schema and returns the average SGPA of boys from the state of Karnataka for each spring semester during the years 2002-2005.

[15+5=20]