National Institute of Technology Calicut

Department of Computer Science and Engineering

CS3095D DATABASE MANAGEMENT SYSTEMS LABORATORY

B.Tech. - 28.10.2022

Time: 30 minutes **3 Marks**

Set A

1. Consider a relation schema R(A, B, C, D, E) with the following three functional dependencies. AB → C ; BC → D ; C →E; The number of superkeys in the relation R is _____. Justify.

(0.5 + 0.5 marks)

2. A database of research articles in a journal uses the following schema.
(VOLUME, NUMBER, STARTPAGE, ENDPAGE, TITLE, YEAR, PRICE)
The primary key is (VOLUME, NUMBER, STARTPAGE, ENDPAGE) and the following functional dependencies exist in the schema.
(VOLUME, NUMBER, STARTPAGE, ENDPAGE) → TITLE
(VOLUME, NUMBER) → YEAR
(VOLUME, NUMBER, STARTPAGE, ENDPAGE) → PRICE
The database is redesigned to use the following schemas.
(VOLUME, NUMBER, STARTPAGE, ENDPAGE, TITLE, PRICE)
(VOLUME, NUMBER, YEAR)
Which is the weakest normal form that the new database satisfies but the old one does not? Justify your answer. **(0.5 + 0.5 marks)**

3. Consider the relation schema R=(E, F, G, H, I, J, K, L, M, N) and the set of functional dependencies {{E, F}→{G}, {F} →{I,J}, {E, H}→{K,L}, {K} →{M}, {L} →{N}} on R. What is the key for R? **(0.5 Marks)**

4. Consider a relation scheme R = (A, B, C, D, E, H) on which the following functional dependencies hold: {A–>B, BC–>D, E–>C, D–>A}. What are the candidate keys of R? **(0.5 Marks)**

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