

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

THIRD YEAR

B.A./B.SC. FIFTH SEMESTER (July – December) 2014

Mid-Semester Examination, September 2014

Date : 15/09/2014

COMPUTER SCIENCE (Honours)

Time : 2 pm – 4 pm

Paper : V

Full Marks : 50

[Use a separate answer book for each group]

Group – A

(Answer any two questions)

1. a) “ER-Model cannot represent relationship among relationship” —critically comment on it. How Aggregation is converted into database tables? [3+2]
b) Consider the following schema.
Salesman (Did, Sname, City, Grade)
Item (Item_id, Iname, price)
SP (Sid, Item_id, City)
Design a suitable Network model using the above schema. You can take appropriate records to design the model. [5]
2. a) What do you mean by superfluous attributes? [2]
b) Distinguish between Horizontal fragmentation & vertical fragmentation with respect to relational Algebra. [2]
c) Consider the following schema for a Book club :
Members (M_id, Name, Designation, Age)
Books (Bid, BAuthor, BPublisher, Bprice)
Reserves (M_id, Bid, Date)
Write the Relational Algebra expression for the following query.
[Note : you can use only basic relational algebra operations]
i) Find the names of members who have reserved all the books.
ii) Find the titles of books reserved by professors. [4+2]
3. a) Consider the relation R(A,B,C,D,E). Two sets of functional dependencies are given :
 $E = \{A \rightarrow B, AB \rightarrow C, D \rightarrow AC, D \rightarrow E\}$ & $F = \{A \rightarrow BC, D \rightarrow AE\}$.
Check whether E & F are equivalent or not. [3]
b) A set of FDs for the relation R(A,B,C,D,E,F) is $F = \{AB \rightarrow C, C \rightarrow A, BC \rightarrow D, ACD \rightarrow B, BE \rightarrow C, EC \rightarrow FA, CF \rightarrow BD, D \rightarrow E\}$. Find the minimum cover for F. [7]
4. a) Consider the following relation
Report (report_no, editor, dept_no, dept_name, dept_addr, author_id, author_name, author_addr)
along with following dependencies
 $F = \{report_no \rightarrow editor; editor \rightarrow dept_no; dept_no \rightarrow dept_name, dept_addr; author_id \rightarrow author_name, author_addr\}$
Normalize the above relation into highest normal form. [7]
b) What do you mean by Non-additive join? [3]

P.T.O →

Group – B

(Answer **any two** questions)

5. a) Draw and explain timing diagram of RST instruction. [6]
b) What is meant by bus idle machine cycle? [2]
c) What for HOLD and HLDA signals are used? [2]
6. a) Briefly explain various types of hardware interrupts of 8085 microprocessor. [7]
b) Describe the role of SIM in interrupt processing. [3]
7. a) Explain the concept of foldback memory. [5]
b) Explain "CALL" and "RETURN" with proper example. [5]

Group – C

(Answer **any one** question)

8. a) Explain Iterative Waterfall model of software development. [5]
b) Write about different types of views of a system captured by UML diagram. [5]
9. a) Draw a DFD of billing system that is run in an e-commerce. Consider any entity process that may be suitable for the above system. [7]
b) What are the different categories of softwares according to COCOMO? [3]

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