

1. What are the possible advantages of using distributive processing in a database system environment? [06]
2. What are the problems that can be experienced from having non-normalized files in a DBS? [08]
3. Relation R {A, B, C, . . . K} is in 1NF only. The following FDs hold:
 - a) Primary key is (ABC)
 - b) $A \rightarrow D$
 - c) $B \rightarrow E$
 - d) $F \rightarrow G, H, I$
 - e) $J \rightarrow B$
 - f) $K \rightarrow C$
 - g) $(AF) \twoheadrightarrow J/K$

By repeatedly using Heath's or Fagin's theorems, decompose R into a set of 5NF relations. Show how the new relations will be keyed. [15]

4. The following atomic data elements were taken from the data dictionary of an inventory management system:

Item Number [ITM#]	Item Name [ITMNAME]
Item Last Price [ITMLP]	Item On Hand Quantity [ITMQOH]
Item Average Price [ITMAP]	Item Category Code [ITMCTG]
Category Description [CTGDES]	Item Supplier [ITMSPLR]
Order# [ORD#]	Order Date [ORDDATE]
Item Ordered [ORDITM]	Quantity Ordered [ORDQTY]
Order Status [ORDSTS]	Invoice Number [INV#]
Receipt Date [RCVDATE]	Item Received [RCVITM#]
Quantity Received [RCVQTY]	Invoice's Related Order [INVORD#]
Requisition Date [RQSDATE]	Requisition Number [RQS#]
Department Requesting [RQSDEPT]	Issuance Date [ISSDATE]
Requisition Honor Date [RQSHDATE]	Quantity Issued [ISSQTY]
Issuance Number [ISS#]	Item Issued [ISSITM]
Item Issue Price [ISSPRC]	Department Receiving the Issue [ISSDPT]

Group the attributes into related entities. Then for each entity, identify the FDs, and then normalize it. Grade will be assigned as follows:

- 4.1 Identification of all possible FDs. [11]
- 4.2 Putting the elements into normalized relations. You may introduce elements as required with appropriate explanation. [44]
- 4.3 Construct an ERD representing the case with its normalized relations. [30]

Total Possible Points: 114