Name:_____

CALIFORNIA STATE UNIVERSITY, SACRAMENTO
School of Business Administration

MIS 114 - Database Management Systems for Business

Exam 3

PART I (closed books and notes)

1.   (8 points) List four integrity constraints for a database and give an example for each one.

2.   (12 points) Describe three techniques for controlling concurrency processing.

3.   (12 points) Discuss the three factors to design a distributed relational database.

4.   (10 points) List the concepts used in an object oriented database design and/or programming.

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PART II (open books and notes)

5. Given the following relations:

Staff (**Staff_no**, name, dept, skill_code)
Skill (**Skill_code**, description, charge_rate)
Project (**Project_no**, start_date, end_date, budget, project_manager)
Booking (**Staff_no**, **project_no**, date_work_on, time_worked_on)

where

Staff	contains staff details; and staff_no is the key.
	Skill contains descriptions of skill codes (e.g. programmer, analyst, etc) and the charge_rate per hour for that skill; and the key is skill_code.
Project	contains project details; project_manager contains the staff_no of the project manager; and project_no is the key.
Booking	contains details of the date and the number of hours that a member of staff worked on a project; and the key is staff_no and project no.

(a) (5 points) List all skills with a charge rate greater than $100 per hour, in alphabetical order of description.

(b) (5 points) List all staff with the skill description "Programmer" who work in the "Special Project" department.

(c)   (5 points) How many staff have the skill "programmer"?

(d)   (5 points) List all projects that have at least two staff booking to it.

(e)   (5 points) List all staff with a charge rate greater than the average charge rate.

(f)   (5 points) For all projects that are active in May 1997, list the staff name, project number and the data and number of hours worked on the project, ordered by staff name, within staff name by the project number and within project number by date.

6. (15 points) Normalize the following table to Boyce-Codd normal form. Identify the primary key(s) with single underline and foreign key(s) with double underline. State your assumption(s) which has to be logical and realistic.

Order (order_number, order_date, customer_number, customer_name, customer_address, product_number, product_name, product_quantity_ordered, product_price, product_total_dollar, order_total_dollar)

Where product_number, product_name, product_quantity_ordered, product_price, and product_total_dollar are repeating group.

7. (5 points) Assume that 2000 payroll records, each 100 bytes long, are to be stored on a magnetic disk having a 2000-byte per block capacity. What is the target block using division/remainder method for the payroll record having a key that is equal to 2000? (5 points)

8.   (8 points) Create a B+ tree for the following records: 24, 53, 42, 65, 34, 98, 45, and 86. let order (degree) = 3.