EASTERN INTERNATIONAL UNIVERSITY
SCHOOL OF COMPUTING
AND INFORMATION TECHNOLOGY

Practice test – Quarter 4, 2023-2024
Course Name: Database
Course Code: CSE 301
Duration: 120 minutes

EXAM CODE: 001

Student's Full Name: ..... **Student ID:**.....

Date: ..... **Room:** .....

There are two parts in the exam:
PART 1: Essay questions: (30 Points). The student answers right below the question.
Given a sales management database schema below:
CUSTOMERS (CUSTOMERS_CODE, FULL_NAME, ADDRESS, PHONE, BIRTH_DATE, QUANTITY_SELL, REGISTRATION_DATE)
Description: Customer relationship will store member customer information including attributes: customers code, full name, address, phone number, date of birth, registration date and quantity sell (total value of guests' bills this member row).
SALESMAN (SALESMAN_CODE, FULL_NAME, BEGINNING_DATE, PHONE)
Description: Each salesperson needs to write down their full name, date of beginning, contact phone, each salesman distinguishes each other by salesman code.
PRODUCTS (PRODUCT_CODE, PRODUCT_NAME, UNIT, MANUFACTURE_COUNTRY, PRICE)
Description: Each product has a code, name, unit, country of manufacture and a selling price.
INVOICE(INVOICE_CODE, PURCHASE_DATE, CUSTOMERS_CODE, SALESMAN_CODE, TOTAL_AMOUNT)
Description: When purchasing, each customer will receive an invoice, which will contain the invoice number, the date of purchase, which salesman sells, how much the invoice is worth and the customer's code if a member customer.
DETAILINVOICE (INVOICE_CODE, PRODUCT_CODE, QUANTITY)
Description: Explain in detail what products are included in each invoice and in what quantity.
QUESTION 1: (10 points) Find primary key and foreign key of sales management database schema

Name table	Primary Key	Foreign Key
CUSTOMERS		
SALESMAN		
PRODUCTS		
INVOICE		
DETAILINVOICE		

QUESTION 2: (20 points) Relational algebra

a) Find invoice code that purchased products "But bi" or " But chi".
b) Find invoice code for purchased products with the quantity from 10 to 20.
c) Find the salesman with name salesman and salesman code who sold the most products.
d) Find the customers (name, code) who bought products: “But long” and “But chi”.
e) Find information of all customers who purchased all products.
f) Find information of all customers who purchased in January 2023 or February 2023.

PART 2: Practical questions (70 points)

QUESTION 1: (20 points) Given the database schema managing a travel company described as follows:

A travel company specializes in organizing tours. Details about each tour include tour code to distinguish tours (TOUR_CODE), tour name (TOUR_NAME), transportation to go (TRANS_GO), return transportation (TRANS_RETURN), price for bookings of tourism (PRICE). Each tour is stored in detail in a table including the number of days (DAYS), number of nights (NIGHTS), each tour has multiple different tourist locations, and each tourist locations has multiple tours.

Each tourist attraction needs to have a tourist location code (LOCATION_CODE), tourist location name (LOCATION_NAME), and characteristic (CHARACTERISTIC) of this tourist location (only storing one main characteristic such as: 'Beach', 'Mountain climbing', 'Shopping', 'Sightseeing'...). This tourist location belongs to a province/city code (PROVINCE_CODE), and a province/city can have multiple tourist locations.

The company also needs to save information about provinces and cities throughout the country including province (or city) code (PROVINCE _CODE), province/city name (PROVINCE_NAME), and which region (REGION) it belongs to. Each tour belongs to a province/city, and a province/city can have multiple different tours.

Each tour will be managed by an employee, and employee information is stored with employee code (EMPLOYEE_CODE), employee name (EMPLOYEE_NAME), address (ADDRESS), phone (PHONE), and fax (FAX).

Requirements: Using draw.io to design an ER- Diagram and Identify Entities with attributes and the relationships between entities in the above schema management. (***Export image from draw.io then insert on file***)

QUESTION 2: Practice on My SQL Workbench (50 points)

1. **Create a database sales_management has detail of table below: (5 points)**

Name table: CUSTOMERS	**Attitude**	**Data type**	**Constraints**
1	CUSTOMERS_CODE	char(4)	primary key
2	FULL_NAME	varchar(40)	not null
3	ADDRESS	varchar(50)	
4	PHONE	char(10)	
5	BIRTH_DATE	date	
6	QUANTITY_SELL	decimal(15,2)	
7	REGISTRATION_DATE	date	

Name table: SALESMAN	**Attitude**	**Data type**	**Constraints**
1	SALESMAN_CODE	char(4)	primary key
2	FULL_NAME	varchar(40)	not null
3	BEGINNING_DATE	date	
4	PHONE	char(10)	

Name table: PRODUCTS	Attitude	Data type	Constraints
1	PRODUCT_CODE	char(4)	primary key
2	PRODUCT_NAME	varchar(40)	not null
3	UNIT	varchar(20)	
4	MANUFACTURE_COUNTRY	varchar(40)	not null
5	PRICE	decimal(15,2)	not null, check (PRICE <> 0)

Name table: INVOICE	Attitude	Data type	Constraints
1	INVOICE_CODE	char(4)	primary key
2	PURCHASE_DATE	date	not null
3	CUSTOMERS_CODE	char(4)	foreign key
4	SALESMAN_CODE	char(4)	foreign key
5	TOTAL_AMOUNT	decimal(15,2)	

Name table: DETAILINVOICE	Attitude	Data type	Constraints
1	INVOICE_CODE	char(4)	not null, foreign key
2	PRODUCT_CODE	char(4)	not null, foreign key
5	QUANTITY	int	not null

2. Insert data (5 points)

CUSTOMERS (CUSTOMERS_CODE, FULL_NAME, ADDRESS, PHONE, BIRTH_DATE, QUANTITY_SELL, REGISTRATION_DATE)

('KH01', 'Nguyen Van A', '731 Tran Hung Dao, Q5, TpHCM', '0809823451', STR_TO_DATE('22-10-1960', '%d-%m-%Y'), '13060000', STR_TO_DATE('22-07-2006', '%d-%m-%Y')),
('KH02', 'Tran Ngoc Han', '23/5 Nguyen Trai, Q5, TpHCM', '0908256478', STR_TO_DATE('03-04-1974', '%d-%m-%Y'), '280000', STR_TO_DATE('30-07-2006', '%d-%m-%Y')),
('KH03', 'Tran Ngoc Linh', '45 Nguyen Canh Chan, Q1, TpHCM', '0938776266', STR_TO_DATE('12-06-1980', '%d-%m-%Y'), '3860000', STR_TO_DATE('05-08-2006', '%d-%m-%Y')),
('KH04', 'Tran Minh Long', '50/34 Le Dai Hanh, Q10, TpHCM', '0917325476', STR_TO_DATE('09-03-1965', '%d-%m-%Y'), '250000', STR_TO_DATE('02-10-2006', '%d-%m-%Y')),
('KH05', 'Le Nhat Minh', '34 Truong Dinh, Q3, TpHCM', '0824645108', STR_TO_DATE('10-03-1950', '%d-%m-%Y'), '21000', STR_TO_DATE('28-10-2006', '%d-%m-%Y')),
('KH06', 'Le Hoai Thuong', '227 Nguyen Van Cu, Q5, TpHCM', '0863109738', STR_TO_DATE('31-12-1981', '%d-%m-%Y'), '915000', STR_TO_DATE('24-11-2006', '%d-%m-%Y')),
('KH07', 'Nguyen Van Tam', '32/3 Tran Binh Trong, Q5, TpHCM', '0916783565', STR_TO_DATE('06-04-1971', '%d-%m-%Y'), '12500', STR_TO_DATE('01-12-2006', '%d-%m-%Y')),
('KH08', 'Phan Thi Thanh', '45/2 An Duong Vuong, Q5, TpHCM', '0938435756', STR_TO_DATE('10-01-1971', '%d-%m-%Y'), '365000', STR_TO_DATE('13-12-2006', '%d-%m-%Y')),
('KH09', 'Le Ha Vinh', '873 Le Hong Phong, Q5, TpHCM', '0865674763', STR_TO_DATE('03-09-1979', '%d-%m-%Y'), '70000', STR_TO_DATE('14-01-2007', '%d-%m-%Y')),
('KH10', 'Ha Duy Lap', '34/34B Nguyen Trai, Q1, TpHCM', '0873468904', STR_TO_DATE('02-05-1983', '%d-%m-%Y'), '675000', STR_TO_DATE('16-01-2007', '%d-%m-%Y'));

SALESMAN (SALESMAN_CODE, FULL_NAME, BEGINNING_DATE, PHONE)
('NV01', 'Nguyen Nhu Nhut', STR_TO_DATE('13-04-2006', '%d-%m-%Y'), '0927345678'),
('NV02', 'Le Thi Phi Yen', STR_TO_DATE('21-04-2006', '%d-%m-%Y'), '0987567390'),
('NV03', 'Nguyen Van B', STR_TO_DATE('27-04-2006', '%d-%m-%Y'), '0997047382'),
('NV04', 'Ngo Thanh Tuan', STR_TO_DATE('24-06-2006', '%d-%m-%Y'), '0913758498'),
('NV05', 'Nguyen Thi Truc Thanh', STR_TO_DATE('20-07-2006', '%d-%m-%Y'), '0918590387');

PRODUCTS (PRODUCT_CODE, PRODUCT_NAME, UNIT, MANUFACTURE_COUNTRY, PRICE)
('BC01', 'But chi', 'cay', 'Singapore', '3000'),
('BC02', 'But chi', 'cay', 'Singapore', '5000'),
('BC03', 'But chi', 'cay', 'Viet Nam', '3500'),
('BC04', 'But chi', 'hop', 'Viet Nam', '30000'),
('BB01', 'But bi', 'cay', 'Viet Nam', '5000'),
('BB02', 'But bi', 'cay', 'Trung Quoc', '5000'),
('BB03', 'But bi', 'hop', 'Thai Lan', '100000'),
('TV01', 'Tap 100 giay mong', 'quyen', 'Trung Quoc', '2500'),
('TV02', 'Tap 200 giay mong', 'quyen', 'Trung Quoc', '4500'),
('TV03', 'Tap 100 giay tot', 'quyen', 'Viet Nam', '3000'),
('TV04', 'Tap 200 giay tot', 'quyen', 'Viet Nam', '5500'),
('TV05', 'Tap 100 trang', 'chuc', 'Viet Nam', '23000'),
('TV06', 'Tap 200 trang', 'chuc', 'Viet Nam', '53000'),
('TV07', 'Tap 100 trang', 'chuc', 'Trung Quoc', '34000'),
('ST01', 'So tay 500 trang', 'quyen', 'Trung Quoc', '40000'),
('ST02', 'So tay loai 1', 'quyen', 'Viet Nam', '55000'),
('ST03', 'So tay loai 2', 'quyen', 'Viet Nam', '51000'),
('ST04', 'So tay', 'quyen', 'Thai Lan', '55000'),
('ST05', 'So tay mong', 'quyen', 'Thai Lan', '20000'),
('ST06', 'Phan viet bang', 'hop', 'Viet Nam', '5000'),
('ST07', 'Phan khong bui', 'hop', 'Viet Nam', '7000'),
('ST08', 'Bong bang', 'cai', 'Viet Nam', '5000'),
('ST09', 'But long', 'cay', 'Viet Nam', '5000'),
('ST10', 'But long', 'cay', 'Trung Quoc', '7000');

INVOICE (INVOICE_CODE, PURCHASE_DATE, CUSTOMERS_CODE, SALESMAN_CODE, TOTAL_AMOUNT)
('1001', STR_TO_DATE('23-07-2006', '%d-%m-%Y'), 'KH01', 'NV01', 320000),
('1002', STR_TO_DATE('12-08-2006', '%d-%m-%Y'), 'KH01', 'NV02', 840000),
('1003', STR_TO_DATE('23-08-2006', '%d-%m-%Y'), 'KH02', 'NV01', 100000),
('1004', STR_TO_DATE('01-09-2006', '%d-%m-%Y'), 'KH02', 'NV01', 180000),
('1005', STR_TO_DATE('20-10-2006', '%d-%m-%Y'), 'KH01', 'NV02', 3800000),
('1006', STR_TO_DATE('16-10-2006', '%d-%m-%Y'), 'KH01', 'NV03', 2430000),
('1007', STR_TO_DATE('28-10-2006', '%d-%m-%Y'), 'KH03', 'NV03', 510000),
('1008', STR_TO_DATE('28-10-2006', '%d-%m-%Y'), 'KH01', 'NV03', 440000),
('1009', STR_TO_DATE('28-10-2006', '%d-%m-%Y'), 'KH03', 'NV04', 200000),
('1010', STR_TO_DATE('01-11-2006', '%d-%m-%Y'), 'KH01', 'NV01', 5200000),
('1011', STR_TO_DATE('04-11-2006', '%d-%m-%Y'), 'KH04', 'NV03', 250000),

('1012', STR_TO_DATE('30-11-2006', '%d-%m-%Y'), 'KH05', 'NV03', 21000),
('1013', STR_TO_DATE('12-12-2006', '%d-%m-%Y'), 'KH06', 'NV01', 5000),
('1014', STR_TO_DATE('31-12-2006', '%d-%m-%Y'), 'KH03', 'NV02', 3150000),
('1015', STR_TO_DATE('01-01-2007', '%d-%m-%Y'), 'KH06', 'NV02', 910000),
('1016', STR_TO_DATE('01-01-2007', '%d-%m-%Y'), 'KH07', 'NV02', 12500),
('1017', STR_TO_DATE('02-01-2007', '%d-%m-%Y'), 'KH08', 'NV03', 35000),
('1018', STR_TO_DATE('13-01-2007', '%d-%m-%Y'), 'KH01', 'NV03', 330000),
('1019', STR_TO_DATE('13-01-2007', '%d-%m-%Y'), 'KH01', 'NV03', 30000),
('1020', STR_TO_DATE('14-01-2007', '%d-%m-%Y'), 'KH09', 'NV04', 70000),
('1021', STR_TO_DATE('16-01-2007', '%d-%m-%Y'), 'KH10', 'NV03', 67500),
('1022', STR_TO_DATE('16-01-2007', '%d-%m-%Y'), NULL, 'NV03', 7000),
('1023', STR_TO_DATE('17-01-2007', '%d-%m-%Y'), NULL, 'NV01', 330000);

DETAILINVOICE (INVOICE_CODE, PRODUCT_CODE, QUANTITY)

('1001', 'TV02', '10'),	('1006', 'ST01', '30'),	('1014', 'BB01', '50'),
('1001', 'ST01', '5'),	('1006', 'ST02', '10'),	('1015', 'BB02', '30'),
('1001', 'BC01', '5'),	('1007', 'ST03', '10'),	('1015', 'BB03', '7'),
('1001', 'BC02', '10'),	('1008', 'ST04', '8'),	('1016', 'TV01', '5'),
('1001', 'ST08', '10'),	('1009', 'ST05', '10'),	('1017', 'TV02', '1'),
('1001', 'BC04', '20'),	('1010', 'TV07', '50'),	('1017', 'TV03', '1'),
('1002', 'BB01', '20'),	('1010', 'ST07', '50'),	('1017', 'TV04', '5'),
('1002', 'BB02', '20'),	('1010', 'ST08', '100'),	('1018', 'ST04', '6'),
('1003', 'BB03', '10'),	('1010', 'ST04', '50'),	('1019', 'ST05', '1'),
('1004', 'TV01', '20'),	('1010', 'TV03', '100'),	('1019', 'ST06', '2'),
('1004', 'TV02', '10'),	('1011', 'ST06', '50'),	('1020', 'ST07', '10'),
('1004', 'TV03', '10'),	('1012', 'ST07', '3'),	('1021', 'ST08', '5'),
('1004', 'TV04', '10'),	('1013', 'ST08', '5'),	('1021', 'TV01', '7'),
('1005', 'TV05', '50'),	('1014', 'BC02', '80'),	('1021', 'TV02', '10'),
('1005', 'TV06', '50'),	('1014', 'BB02', '100'),	('1022', 'ST07', '1'),
('1006', 'TV07', '20'),	('1014', 'BC04', '60'),	('1023', 'ST04', '6');

3. Creating Constraint for the tables in Database (10 points)

a) Creating constraint to check CUSTOMERS_CODE must start with ‘KH’.

b) Creating constraint to check Unit of products can only be in 'cay', 'hop', 'cai', 'quyen', 'chuc'.

c) Creating constraint to check Customer Phone Number can be 10 or 11.

4. Writing SQL query (40 points)

1. Print out a list of products (PRODUCT_CODE, PRODUCT_NAME) made by "Trung Quoc" that cost from 30,000 to 40,000.

2. Find invoice code sold by salesperson named 'Nguyen Nhu Nhut' and code order by decreasing.

3. Print product code and the sum of quantity per product.

4. Print out a list of invoices (PURCHASE_DATE, Revenue_Per_Day – total amount of a day) where the purchase date must have sales revenue higher than 1,000,000 and ordered by increasing revenue.

5. Find the customer's name and the product name has a total number of products sold greater than 50 that customer purchased. Then sort by number of products sold.
6. Print out a list of customers (CUSTOMERS_CODE, FULL_NAME, ADDRESS) live in District 5 and have the total amount of invoice higher than average amount of invoice.
7. Add 2 columns to DETAILINVOICE: price(decimal (15,2)), amount(decimal(15,2)). Then calculate product price and amount (price * quantity).
8. Update total_amount from INVOICE table with amount value from DETAILINVOICE table.
9. Create a store procedure to find customer information that have total amount more than average of all customers with input address of customer.
10. Create a stored procedure to find the N best-selling products with input N.

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