U.S.N.

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E.   Semester: III
Branch: Biotechnology   Duration: 3 hrs.
Course Code: 19BT3DCBCA   Max Marks: 100
Course: Basics of Computer Applications   Date: 23.09.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
                   2. Missing data, if any, may be suitably assumed.

UNIT - I

1   a)   Write a shell script to create a food menu using Case….esac control structure.   **06**

    b)   What is a Thread? Analyze the diagram and suggest the type of threads helps   **06**
         in conditions labeled as A, B and C to increase CPU utilization and higher
         throughput to execute a process.
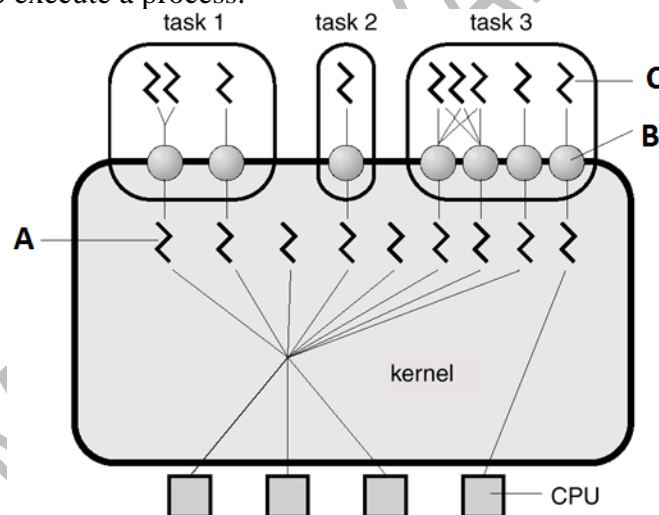
    c)   Mention different types of system components. Explain any two   **08**

UNIT - II

2   a)   A University database contains information about professors (identified by   **10**
         social security number, or SSN) and courses (identified by course_id).
         Professors teach courses; each of the following situations concerns the
         Teaches relationship set.
         For each situation, design an individual ER model that describes it (assuming
         that no further constraints hold).
         a) Professors can teach the same course in several semesters, and each
            offering must be recorded.
         b) Professors can teach the same course in several semesters, and only the
            most recent such offering needs to be recorded. (Assume this condition
            applies in all subsequent questions.)
         c) Every professor must teach some course.
         d) Every professor teaches exactly one course (no more, no less), and every
            course must be taught by some professor.

e) Now suppose that certain courses can be taught by a team of professors jointly, but it is possible that no one professor in a team can teach the course individually. Model this situation, introducing additional entity sets and relationship sets if necessary.

b) Create a Corporation database with the entity Employee and Company having the following attibutes: **10**

Employee(E_Id, Name, Joining date,designation,city)

Corporation (E_Id, C_name, salary)

Construct a SQL query for each of the following.

   a. Display the list of all the employees whose designation is manager and salary more than 50000, or designation is officer and salary more than 50000

   b. Find the names, designation and cities for all employees whose joining date is before 01st Jan 2001 and earn more than 2,00,000.

   c. Add a constraint default city is 'Delhi'

   d. Modify the salary of employee into 50000 whose name is 'Anusha'.

   e. Display the lowest salary of the employee.

   f. Display the unique values of designation from Employee table.

   g. Remove the details of employee whose joining date is before 31st July 1980.

OR

3 a) Create a bank database with the entities customer and accounts having the following attibutes: **14**

Customer (C_ID,name,dob,city, contact)

Account (Accno,C_ID,Balance)

Construct a SQL query for each of the following and write the output also.

   a. Modify table add constraint primary key C_ID for customer table and Accno for Account table.

   b. Add a constraint check to check the balance greater than 1000.

   c. Insert 4 records into both the tables.

   d. Create a view for account table with Accno and Balance.

   e. List the details of all the customers whose city having pattern 'ng' in it.

   f. Display the account numbers for all accounts where the balance is less than 2000.

   g. Display the details of all customers who are having an account.

   h. Display the details of all the customers whose city in Kolkata, Bangalore, and Chennai and balance between 1000 to 14200

   i. Display the details of all customers whose name ends with 'i'

   j. Create a new table having C_ID and name as attributes from customer table.

b) Deduce an ER diagram for a hospital management database considering the following requirements list: **06**

   a. Patients are identified by P_Id, name, diagnosis and address.

   b. Doctors' works in hospital are identified by D-Id, specialisation, name and salary.

   c. Each patient has a medical record identified by R_ID, medical issue and date of examination.

   d. Patients are admitted to hospital identified by H_ID, name address and city.

UNIT - III

4	a)	Write a Perl script for transcription from DNA to RNA.	**04**
	b)	Give an account on pattern matching operators with appropriate examples.	**06**
	c)	Write a Perl script and output for the following:	**10**

     i. Initialize an array of bases A, T, G, C, X.
    ii. Remove the element at the end of array and insert in the beginning and print the elements.
   iii. Add an element 'U', 'Y' after third element of the array and print the elements.
   iv. Remove the element at the beginning of array and insert at the end and print the elements.
    v. Remove two elements after 2rd element of array then print the array in reverse and find the remaining length of the array.

OR

5	a)	Write a Perl script to store a DNA sequence and to count the number of bases and errors present in it.	**05**
	b)	Write a Perl script to calculate the reverse complementary of a sequence	**05**
	c)	Write a Perl script to translate a DNA sequence to PROTEIN Sequence.	**10**

UNIT - IV

6	a)	Create a simple calculator using python program.	**10**
	b)	Write a Python program to calculate the BMI of a person and print whether the person is underweight or over weight based on BMI value.	**05**
	c)	Describe the typical exceptions in python and how to handle them.	**05**

UNIT - V

7	a)	Using Matlab Symbiology toolbox, simulate the glucose insulin response for normal subject and for a type-2 diabetic patient considering a single meal dose of 85grams of glucose.	**10**
	b)	Describe with suitable example any five commands to work with matrix and arrays in Matlab.	**05**
	c)	Plot the sine(x) function where x ranges from 0 to 2π with a differential of $\pi/20$ over three different ranges like x, x- $\pi/2$ and x- π using different line styles, colours, and markers.	**05**

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