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

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E.
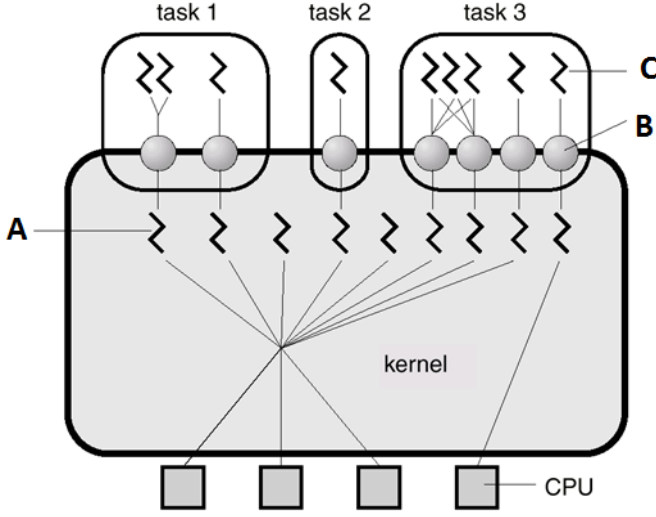Branch: Biotechnology
Course Code: 22BT4PCBCA
Course: Basics of Computer Applications

Semester: IV
Duration: 3 hrs.
Max Marks: 100

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	CO	PO	Marks
1	a)		What is a process? Describe the different states of a process with a diagram of process state.	CO1		**05**
	b)		What is a Thread? Analyze the diagram and suggest the type of type of threads helps in conditions labeled as A, B and C to increase CPU utilization and higher throughput to execute a process.	CO 1	PO3	**05**
	c)		Write a shell script to create a menu based on the items present in the list to execute the command.	CO1		**05**
	d)		Define process scheduling. Explain different types of schedulers with a shematic representation of process scheduling.	CO1		**05**
			UNIT - II			
2	a)		Create a Bank database with the entities customer and accounts having the following attributes: Customer (C_ID, name, dob, city, contact) Account (Acc_no, C_ID, Balance) Construct a SQL query for each of the following. a. Modify table add constraint primary key C_ID for customer table and Acc_no for Account table.	CO 2	PO1	**14**

			b. Add a constraint check to check the balance greater than 1000. c. Insert 4 records into both the tables. d. Modify table add constraint foreign key for C_ID for account table. e. Create a view for account table with Acc_no and Balance. f. Display the details of customer whose name starts with 'A' and except from city Delhi. g. Display the details of top 3 highest account balance of the customer. h. Modify the contact of the customer '9887548212' whose name is 'Namratha' i. Create a new table balance_details and insert the values from account table where balance between 50000-150000. j. Remove the foreign key constraint for C_ID in account table.			
		b)	Deduce an ER diagram for Indian premier league [IPL] database considering the following requirements list: a. The IPL has many teams. b. Each team has a unique name, state, a coach and players. c. Players' play for a team and each team is headed by a captain. d. Each player is identified by his name and skill set (bat, bowl, all-rounder). e. A log of injury records identified by ID and description is maintained for players. f. A match is played between two teams identified by unique ID, date and points.	CO3	PO2	06
			OR			
	3	a)	Design a Consumer database with the entities Customers and Orders having the following attributes: Customers (C_ID, name, DOB, city, contact) Orders (O_ID, C_ID, Order Item, Price, date) Construct a SQL query for each of the following. a. Insert 4 records into both the tables. b. Add a constraint not null to C_ID for customer table. c. Modify table add constraint primary key C_ID for customer table and O_ID for Order table. d. Add a constraint check to check the Price greater than 3800. e. Display the O_Id's for all orders where the Price is less than 5000. f. Display the details of top 3 highest price items ordered by a customer. g. Remove the details of DOB of customer from the customers table. h. Insert values into new table having C_ID and name as attributes from Customers table. i. List the name of customer if he has ordered any item between 1st Aug to 1st Sept 2019. j. Modify the contact of the customer to '9875441203' whose name is 'XYZ'.	CO 2	PO 1	14

		b)	Deduce an ER diagram for a health center considering the following requirements list: a. Doctors are identified by D-Id, name and specialization. b. Patients are identified by P-Id, name, insurance, date of admission and date of discharge. c. Tests are identified by T-Id, test-name, date, time and result. d. Each patient is associated with a log of the various tests and examinations conducted by doctors.	CO 3	PO 2	**06**
			UNIT - III			
4	a)		Write a Perl script to calculate reverse complementary of a DNA sequence.	C02	PO 1	**05**
	b)		Give an account on pattern matching operators with appropriate examples.	CO 2	PO 1	**05**
	c)		Write a Perl script and output for the following: i. Initialize an array of numbers 21,36,45,72. ii. Add an element '65', '87' after one element of the array and print the bases. iii. Remove the element at the beginning of array and insert at the end. iv. Remove the element at the end of array and insert in the beginning. v. Remove the element at the beginning of array and print the array in reverse.	CO 2	PO1	**10**
			OR			
5	a)		Write a Perl script and output for the following: i. Declare a hash variable with any 5 students names and their marks list. ii. Add a student's details to this list. iii. Check for the presence of a particular student details in it. iv. Delete a student's detail from it. v. Access an individual student's detail from the list.	CO 2	PO 1	**10**
	b)		Write a Perl script to read protein sequence in files and print sequence.	CO2	PO 1	**04**
	c)		How do you declare variables using various datatypes in Perl? Deliberate	CO 1		**06**
			UNIT - IV			
6	a)		Write a Python program for the following to create a model to predict outcome of the events for a random data set. i. Generate random data set. ii. Split the date into train and test and display them. iii. Create a model with the training data by fitting in a polynomial regression. iv. Test the model accuracy with the testing data. v. Predict the future value for an unknown sampling data.	CO 3	PO 2	**10**
	b)		Write a Python program to solve the quadratic equation $ax^2+bx+c=0$	CO 3	PO2	**05**

		c)	Write a Python program to generate a linear regression plot for the following data set. x = [5,7,8,7,2,17,2,9,4,11,12,9,6] y = [99,86,87,88,111,86,103,87,94,78,77,85,86]	*CO 3*	*PO 2*	**05**
			UNIT - V			

7	a)		Using Matlab Simbiology toolbox;
			    i. Construct a simple model with two species (A and B)
			    ii. Add a reaction that involves two species A and B, where A is converted to B.
			   iii. Add species A and B to the model.
			   iv. Set the initial amount of the first species (A) to 50.
			    v. Add a kinetic law object to the reaction.
			   vi. Set the parameter variable names property of the kinetic law.
			  vii. Define the kinetic law of the reaction to follow mass action kinetics.
			 viii. Add a rate constant parameter to the mass action kinetic law.
			   ix. Simulate the model and plot the simulation results.
				CO 3	*PO 2*	**10**

	b)		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.	*CO 3*	*PO2*	**05**
	c)		Create data points on a sine curve with x ranges from o to 4π with a differential of 0.1 and plot the data for sin(x) function against radians.	*CO 3*	*PO2*	**05**

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