U.S.N.										

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

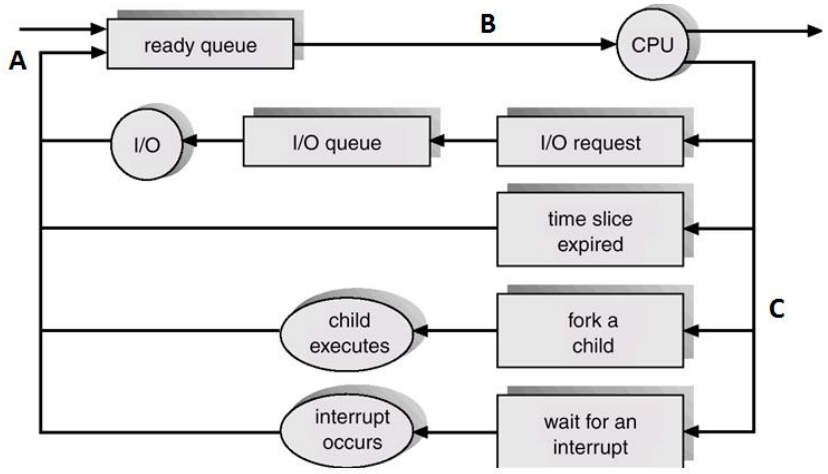
Autonomous Institute Affiliated to VTU

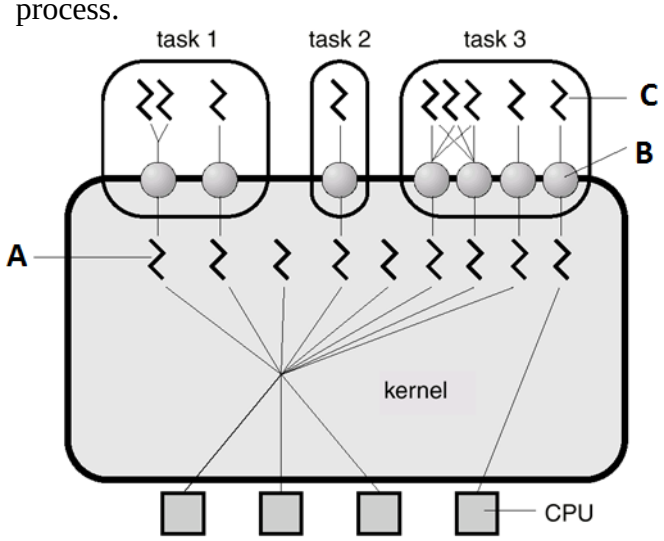
February 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 23BT4PCBCA / 22BT4PCBCA **Max Marks: 100**
Course: BASICS OF COMPUTER APPLICATIONS

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

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Analyze the diagram and suggest and interpret the type of scheduler is used in conditions labeled as A, B and C to increase CPU utilization and higher throughput. 	CO1	PO	05
	b)	Write a shell script to create a menu based on the items present in the list to execute the command.	CO1	PO	05
	c)	Discuss the various services provided by the operating system.	CO1	PO	05
	d)	Interpret the following file permission in linux and demonstrate on changing file permissions. **-rwxrw-r--**	CO1	PO	05
		OR			
2	a)	What is a process? Describe the different states of a process with a diagram of process state.	CO1	PO	06
	b)	Describe with suitable example any eight Linux commands.	CO1	PO	08

		c)	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.  	*CO1*	*PO*	**06**
			UNIT – II			
	3	a)	Deduce an ER diagram for National Hockey League [NHL] database considering the following requirements list: a. The NHL has many teams. b. Each team has a name, a city, a coach, a captain, and a set of 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 (left wing or goal keeper). 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 score.	*CO3*	*PO2*	**06**

		b)	Create a Insurance database with the entity customer and company having the following attibutes: Customer (C_id, name, email, contact, DOB, city) Company(ID, C_id, IC_name, policy_type, cost, claim_amount) Construct a SQL query for each of the following and write the output also. a. Create Insurance database b. Create table Customer and Company with given attributes. c. Insert 4 records into both the tables. d. Modify the table customer and add a column named Address, with data type VARCHAR(250) e. Add a constraint foreign key to the column C_ID for company table. f. Modify the table customer change the data type of contact to bigint. g. Add a constraint not null for DOB. h. Display the details of the customer who has claimed an amount less than 200000. i. Find the names, designation and cities for all customer whose name second letter is 'n' and having a term insurance policy. j. Modify the policy cost of customer into 100000 whose insurance id is '7842125'. k. Insert values into new table having C_ID and name as attributes from Customers table. l. Remove the policy details of employee whose policy cost is between 30000 and 800000.	***CO2***	***PO1***	**14**
			OR			
	4	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. Create Consumer database. b. Create Customers and Orders table with the given attributes. c. Insert 4 records into both the tables. d. Add a constraint not null to C_ID for customer table. e. Modify table add constraint primary key C_ID for customer table and O_ID for Order table. f. Add a constraint check to check the Price greater than 8000. g. List the details of all the Customers whose city name having 'ang'. h. Display the O_Id's for all orders where the Price is less than 50000.	***CO2***	***PO1***	**10**

		b)	Considering the above database (refer 3a.); Construct a SQL query for each of the following. a. Modify the table to include the email Id of customer into the Customers table. b. List the name of customer if he has ordered any item between 1st Aug to 1st Sept 2019. c. Modify the contact of the customer to '9875441203' whose name is 'Anirudh'. d. Display the count of orders made between 25th April 2019 to 30th April 2019. e. Display the unique values of city from customer table. f. Create a view for Orders table with O_ID, Price. g. Display the details of all the customers whose city in Kolkata, Bangalore, and Chennai and order Price between 12000 to 25000. h. Display the details of top 3 highest price items ordered by a customer. i. Remove the details of DOB of customer from the customers table. j. Insert values into new table having C_ID and name as attributes from Customers table.	***CO2***	***PO1***	**10**
			UNIT – III			
	5	a)	Explicate on how do you declare variables using various datatypes in Perl.	***CO1***	***PO***	**05**
		b)	Write a Perl script to store and read a protein sequence.	***CO2***	***PO1***	**05**
		c)	Write a Perl script and output for the following: i. Declare a hash variable for any 5 items and their price. ii. Add an item with its price to this list. iii. Check for the presence of a particular item in it. iv. Delete an item details from the item list. v. Access an individual item present in the list.	***CO2***	***PO1***	**10**
			OR			
	6	a)	Write a Perl script to translate a DNA sequence to PROTEIN Sequence.	***CO2***	***PO1***	**10**
		b)	Write a Perl script and output for the following: i. to store a DNA sequence bases and to count the number of bases and errors present in it. ii. Calculate reverse complementary of a RNA sequence.	***CO2***	***PO1***	**10**
			UNIT – IV			
	7	a)	Write a python program to calculate the BMI and check whether the person is Obese or underweight.	***CO3***	***PO2***	**05**
		b)	Develop a model of an epidemic as it spreads in a susceptible population, and use it to evaluate the effectiveness of possible interventions a. Model Equations. b. Implementation of Model. c. Update function to take the current state of a system. d. Running the simulation. e. Collecting the Results. f. Plotting the results.	***CO3***	***PO2***	**10**
		c)	Write a Python program to solve the quadratic equation $ax^2+bx+c=0$	***CO3***	***PO2***	**05**

			OR			
	8	a)	Create a simple calculator using python program.	***CO3***	***PO2***	**10**
		b)	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]	***CO3***	***PO2***	**05**
		c)	Write a Python program to check whether a string is palindrome or not.	***CO3***	***PO2***	**05**
			UNIT – V			
	9	a)	A group of individuals took a journey by train at Rs. 3 per kid and Rs. 3.2 per adult for a sum of Rs. 118.4. On their return trip, they took a bus back at Rs. 3.5 per kid and Rs. 3.6 per adult for a sum of Rs. 135.20. Compute how may kids and adults were there in the group.	***CO3***	***PO2***	**05**
		b)	Plot for the function sin(x) and Cos(x) in the same graph where x ranges from 0 to 1 with a differential of 0.01 and mark the legends for both functions.	***CO3***	***PO2***	**05**
		c)	Using Matlab Simbiology toolbox, simulate the glucose insulin response for normal subject and for a type-2 diabetic patient considering a single meal dose of 50grams of glucose.	***CO3***	***PO2***	**10**
			OR			
	10	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. x. Plot the simulation results.	***CO3***	***PO2***	**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.	***CO3***	***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.	***CO3***	***PO2***	**05**

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