VIT
Vellore Institute of Technology

Slot :A2

School of Information Technology and Engineering

Winter Semester 2022-2023 (Freshers)

Continuous Assessment Test – II

Programme Name & Branch M.C.A & Computer Application

Course Name & code:ITA5004 & Object Oriented Programming using JAVA

Class Number (s): VL2022230500239, VL2022230500268, VL2022230500294

Faculty Name (s): Bimal Kumar Ray(10134), Shynu P G(12340), Thanga Mariappan L(19709)

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s):

Q.No.	Question	Max Marks
1.	Illustrate how to address the sorts of problems that can arise when you try to synchronize threads, let's consider a simple application in which several threads use a shared resource. You're familiar with those take-a-number devices that are used in bakeries to manage a waiting line. Customers take a number when they arrive, and the clerk announces who's next by looking at the device. As customers are called, the clerk increments the "next customer" counter by one. There are some obvious potential coordination problems here. The device must keep proper count and can't skip customers. Nor can it give the same number to two different customers. Nor can it allow the clerk to serve nonexistent customers. Our task is to build a multithreaded simulation that uses a model of a take-a-number device to coordinate the behavior of customers and a (single) clerk in a bakery waiting line. To help illustrate the various issues involved in trying to coordinate threads, develop the program based on the problem statement.	10
2.	Write a Software Phone App using Java Swing . The user enters the phone number it need to display in the number box and pushes the "CALL" button to start a phone call. Once the call is started, the label of the "CALL" button it will display a message box that call initiated and also changes to "HANG UP". When the user hangs up, the display is cleared. The user clicking the end button a message box to show the call termination message. When the user press clear button it need to deletes the last entered number.	10
3.	Create an ATM program for representing ATM transaction. In the ATM program, First the user needs to do login by setting the password with a condition that the following must be eight characters minimum out of which atleast one Capital letter, special character, numbers while typing the password it need to display as "*" instead of characters in the password field, then after verifying login the user has to select an option from the menu displayed on the screen. The options are related to withdraw the money, deposit the money, check the balance, and exit. Initially set a balance amount as Rs1,25,000/- To withdraw the money, we simply get the withdrawal amount from the user and remove that amount from the total balance and print the successful message.	10

	To deposit the money, we simply get the deposit amount from the user, add it to the total balance and print the successful message. To check balance, we simply print the total balance of the user. Display messagebox for each menu.	
4.	Write a program in Java named Copy to copy one file into another. The program should prompt the user for two file names, filename1 and filename2. Both filename1 and filename2 must exist or the program should throw a FileNotFoundException. Although filename1 must be the name of a file (not a directory), filename2 may be either a file or a directory. If filename2 is a file, then the program should copy filename1 to filename2. If filename2 is a directory, then the program should simply copy filename1 into filename2. That is, it should create a new file with the name filename1 inside the filename2 directory, copy the old file to the new file, and then delete the old file.	10
5.	Define a data-manipulation application for the books database. The user should be able to edit existing data and add new data to the database. Allow the user to edit the database in the following ways with statements supporting dynamic parameter: a) Add a new author. b) Edit the existing information for an author. c) Add a new title for an author. (Remember that the book must have an entry in the AuthorISBN table.). d) Add a new entry in the AuthorISBN table to link authors with titles. e) Return the resultset f) count number of updates performed in the Database	10

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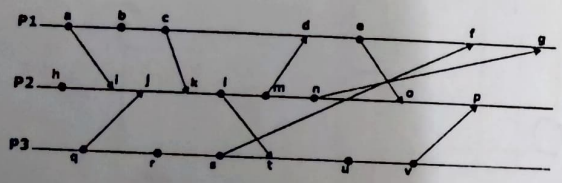
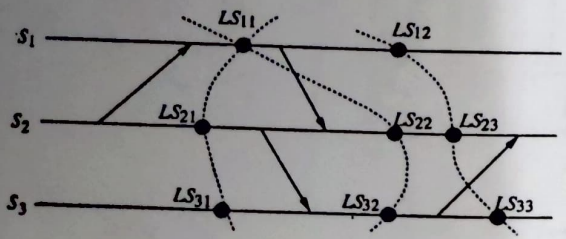
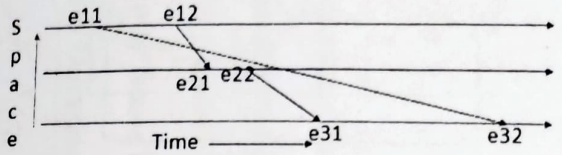
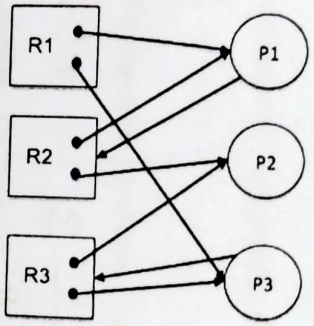
			SLOT : B2
School of Information Technology and Engineering			
Winter Semester 2022-2023			Continuous Assessment Test – II
Programme Name & Branch		MCA	
Course	ITA5006	Course	Distributed Operating Systems
Class	VL2022230500270 , VL2022230500524, VL2022230500243		
Faculty	Dr.M.RAJKUMAR, Dr.T.SENTHIL KUMAR, Dr.D.KARTHIKEYAN		

Exam Duration: 90 Min. **Maximum Marks: 50**

General Instruction(s): Answer ALL Questions.

Q.No.	Question	Max Marks
1.	 1. For the event diagram above, label all events with vector clocks. Assume that the vector elements are all set to zero at the beginning. (6 marks) 2. Apply the vector timestamp rules to determine whether the following event pairs are concurrent events or not? Explain why. (4 marks) a) Is g ∥ q? b) Is e ∥ u?	10
2.	 Analyze the above space -time diagram and identify whether the global state events are consistent or in- consistent or strongly consistent paths. Examine with Lamport's Chandy global state recording algorithm with marker rule.	10

3.	Consider the below space -time diagram  (i) Trace SES protocol to ensure the ordering of messages in above scenario. (5) (ii) Discuss BSS protocol for causal ordering of messages for the above diagram. In what way this algorithm is different from SES protocol? (5)	10
4.	Consider the following resource allocation graph:  a) Does the above allocation graph contain a deadlock? Justify your answer. (3 marks) b) Assume now that P2 also demands resource R1. Does this allocation graph contain a deadlock? Explain your answer. (3 marks) c) Assume the allocation graph at point b), and, in addition, assume that R2 has now three instances. Does this allocation graph contain a deadlock? Justify your answer. (4 marks).	10
5.	Consider the below global state transition diagram, a) construct the WFG and detect the deadlock cycle if any. (3 marks) b) Using Chandy-Misra-Hass's algorithm evaluate the probe values at each process and justify how it detects the deadlocks in distributed systems. (7 marks)	10

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School of Information Technology and Engineering

Winter Semester 2022-2023

Continuous Assessment Test – II

Programme Name: MCA

Course Name & code: Data Mining and Business Intelligence - ITA5007

Class Number (s): 0528, 0296, 0530 **Slot: C2+TC2**

Faculty Name (s) (Dr. E.P.Ephzibah, Dr.Harshita Patel and Dr.S.Jagadeesan)

Exam Duration: 90 Min. **Maximum Marks: 50**

Answers all the Questions (5*10=50 Marks)

1. Use ID3 algorithm to construct a decision tree from the given data. Age, Competition, and Type are the input attributes. The Class is the output attribute with class labels Up and Down. Draw the generated decision tree with appropriate labels and node information.**(10)**

S.No	Age	Competition	Type	Class(Profit)
1	Old	Yes	Software	Down
2	Old	No	Software	Down
3	Old	No	Hardware	Down
4	Mid	Yes	Software	Down
5	Mid	Yes	Hardware	Down
6	Mid	No	Hardware	Up
7	Mid	No	Software	Up
8	New	Yes	Software	Up
9	New	No	Hardware	Up
10	New	No	Software	Up

2. The table given below has five weeks' sales data in Rupees (thousands) that deals with one dependent (y) and one independent variable (x). Implement a linear regression model on the data to find the line of regression. Predict the 7th and 12th week sales. **(10)**

S.No	Week(x)	Sales in Rupees (thousands) (y)
1	1	1.2
2	2	1.8
3	3	2.6
4	4	3.2
5	5	3.8

3. The table given below lists the training instances. Each training instance has two input attributes x1, x2, and one output attribute with class labels 1 and 0. Classify the new incoming instance t1= (3, 7), with k=3 using K-Nearest Neighbour algorithm. Give your observations for assigning an even number to the parameter k. **(10)**

Training Instance	X1	X2	Output
I1	7	7	0
I2	7	4	0
I3	3	4	1
I4	1	4	1

4. Consider the training samples in the dataset given below. Let the test instance be X= (Slow, Rarely, No). Find the most appropriate class label for the given record, X using the Naive Bayes classifier. **(10)**

Swim	Fly	Crawl	Class label
Fast	No	No	Fish
Fast	No	Yes	Animal
Slow	No	No	Animal
Fast	No	No	Animal
No	Short	No	Bird
No	Short	No	Bird
No	Rarely	No	Animal
Slow	No	Yes	Animal
Slow	No	Yes	Fish
Slow	No	Yes	Fish
No	Long	No	Bird
Fast	No	No	Bird

5. The following table shows six transactions by customers at grocery store. Let minimum support is 33.34% and minimum confidence is 60%. Find all frequent item sets and the generated strong rules using the Apriori algorithm.**(10)**

Transaction Id	Items
T1	HotDogs,Buns,Ketchup
T2	Hotdogs, Buns
T3	HotDogs,Coke,Chips
T4	Chips,Coke
T5	Chips,Ketchup
T6	HotDogs,Coke,Chips

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Slot: E2+TE2

School of Information Technology and Engineering

Winter Semester 2022-2023 (Freshers)

Continuous Assessment Test – II

Programme Name & Branch: M.C.A & Computer Application

Course Name & code: ITA6009 & Cloud Computing

Class Number (s): VL2022230500278, VL2022230500486, VL2022230500534

Faculty Name (s): Benjula Anbu Malar M B (10728), Krishnamoorthy N (19622), Arun Kumar A (19707)

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s):

Q.No.	Question	Max Marks
1.	Assume that a resources are provided under peak demands. Illustrate how intergrid gateway is used to allocate the Virtual machines from a local cluster to interact with the public cloud provider to achieve the scalability in performance by dynamic resource deployment.	10
2.	A private owned Transportation enterprise having different zones for transportation and integrated a various department like workshop, online ticket, job scheduler, accounting, route allocation, purchasing and maintenance. The existing package is deployed in user premises. Now they planned to migrate to own cloud services, In this case help them out in provisioning server model, database model in a multi-tenant deployment model.	10
3.	Let us consider leading organization is providing the cloud services. Now the organization wishes to extend their services. They require your advice to state the differences in cloud perspectives of provider, vendors and users. Explain the extended services of the cloud and elaborate on their providers.	10
4.	Consider that a Amazon EC2 instances works over a 8 weeks timeline has a total uptime of 800 hours and a total downtime of 205 hours with 4 failures in this timeline. a) Calculate the computing availability b) Calculate the failure rate (λ) for the above different scenarios.	 6 4
5.	Explain the step by step mapreduce working model for the counting number of words for the following tongue twister. Input1: How much wood would a woodchuck chuck, if a woodchuck could chuck wood? Input 2: He would chuck, he would, as much as he could, and chuck as much wood as a woodchuck would. If a woodchuck could chuck wood.	10

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Slot: F2

School of Information Technology and Engineering

Winter Semester 2022-2023 (Freshers)

Continuous Assessment Test – II

Programme Name & Branch: MCA

Course Name & code: Python Programming (ITA6017)

Class Numbers: VL2022230500538, VL2022230500489, VL2022230500251

Faculty Names: Nivedhitha M, Balasubramani M, Arun Kumar A

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s): Read the questions carefully and answer.

Q.No.	Question	Max Marks
1.	Government of India has appointed two separate teams with three members each for investigating a case. After forming the two teams with three members each, as a cost-cutting measure, the government decides to merge the two teams in to a single team with five members, by eliminating the member with the least experience among all the six members from the two teams. Use dictionaries to store the two teams and form a new team by concatenating the two teams. The chairperson of the new team is the person with the maximum experience. Write a python code to store the members of the two teams as dictionaries, print the new (concatenated) dictionary with the names in an increasing order of experience, to check whether a given name is present in the new dictionary or not and to print the name of the chairperson of the new team. Note: Assume that there is only one person with least experience in the two dictionaries.	10
2.	pneumonoultramicroscopicsilicovolcanoconiosis' is the longest word in a dictionary with 45 characters. Given the value of 'i' and the value of 'k', write a Python code to output five letters which are in position that are the first five multiples of 2*i+k. If the multiple greater than the length of the string then continue the counting from the beginning of the string. For example, if the value of i = 5 and k = 2 then the letters are 'r', 'c', 'n', 'e', and 'i'. The longest string is stored in a variable named as 's' in the precode, used it for coding.	10
3.	John's mother will take him to the doctor's clinic for a check-up. She asks the time by which John has to book a taxi. His	10

	mother has some works: going to the dry-cleaners in the mall, have lunch in the restaurant, buy some dog food at the pet-shop, take money in the bank, to be done on the way, It takes 'x' minutes to drive to the mall and park the vehicle, and 'y' minutes to get the clothes dry cleaned, 'z' minutes for lunch, 'a' minutes to get dog food, 'b' minutes to get money at the bank and 'c' minutes to drive to the doctor's office from the mall. Given the values for 'x', 'y', 'z', 'a' and 'b' and the time of appointment as 'h' hour 'm' minutes, write a Python code to determine when John should leave home. For example if x is 20, y is 10, z is 45, a is 10, b is 10, c is 20 and h is 14 and m is 0, then John has to start from home by 12 hour 05 minutes (assuming it as the current time). Write appropriate functions for accomplishing the task.	
4.	Write a python code for interactive calculator along with a flowchart. User input is assumed to be a formula that consist of a number, an operator (at least + and -), and another number, separated by white space (e.g. 1 + 1). Split user input using str.split(), and check whether the resulting list is valid: • If the input does not consist of 3 elements, raise a FormulaError, which is a custom Exception. • Try to convert the first and third input to a float (like so: float_value = float(str_value)). Catch any ValueError that occurs, and instead raise a FormulaError • If the second input is not '+' or '-', again raise a FormulaError If the input is valid, perform the calculation and print out the result. The user is then prompted to provide new input, and so on, until the user enters quit	10
5.	a) Write a REGEX to validate the pin code of India Test Cases: 1. It can be only six digits. 2. It should not start with zero. 3. First digit of the pin code must be from 1 to 9. 4. Next five digits of the pin code may range from 0 to 9. 5. It should allow only one white space, but after three digits, although this is optional. b) Write a REGEX to validate Identifier Test Cases: 1. It must start with either lower case alphabet[a-z] or upper case alphabet[A-Z] or underscore(_). 2. It should be a single word, the white spaces are not allowed. 3. It should not start with digits.	5+5

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			SLOT: A1
School of Information Technology and Engineering			
Winter Semester 2022-2023			Continuous Assessment Test – II
Programme Name & Branch		MASTER OF COMPUTER APPLICATION	
Course Code:	**MAT 5010**	Course Title:	**Foundations of Data science**
Class Number(s)	VL2022230500506		
Faculty Name(s)	Dr Shashikiran Venkatesha		

Open Book Examination.

Exam Duration: 90 Min. **Maximum Marks: 50**

1. A die is thrown 9000 times and a throw of 3 or 4 occurred 3240 times. Is the die unbiased? Find the confidence limits for the probability of getting of 3 or 4.

2. The following data are got from an investigation.

	No of cases	Mean wages	SD of the wage
Sample 1	400	47.4 rupees	3.1 rupees
Sample 2	900	50.3 rupees	3.3 rupees

Find out the two mean wages differ significantly.

3. Obtain the regression lines for the following data. Also determine the co-efficient of correlation.

X	22	26	29	30	31	31	34	35
Y	20	20	21	29	27	24	27	31

4. From the following data, obtain the partial correlation co-efficient $r_{AB.C}$ and $r_{BC.A}$

A	20 15 25 26 28 40 38
B	12 13 16 15 23 15 28
C	13 15 12 16 14 18 14

5. Find the multiple correlation co-efficient $R_{1.23}$ for the following.

1: 50 54 50 56 50 55 52 50 52 51

2: 42 46 45 44 40 45 43 42 41 42,

3: 72 71 73 70 72 72 70 71 75 71

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Winter Semester 2022-2023

Continuous Assessment Test – II

Programme Name & Branch	:	**MCA**
Course Name & code	:	**ITA6007 & Network and Information Security**
Class Number	:	**VL2022230500249 & VL2022230500274**
Slot	:	**D2+TD2**
Faculty Name (s)	:	**Dr.C. NAVANEETHAN** **Dr.A. ANBARASA KUMAR**

Exam Duration: 90 Min. **Maximum Marks: 50**

Q.No.	Question	Max Marks
1.	Users A and B use the Diffie-Hellman key exchange technique with a common prime q = 71 and a primitive root α = 7. a) If user A has private key of 5, evaluate is A's public key Y_A? b) If user B has private key of 12, estimate B's public key Y_B? c) What is the shared secret key?	10
2.	a) Find private key'd' for RSA algorithm where public key <e,n> is given by n = 11363 and e = 211. Factorize 'n' to find the random numbers 'p' and 'q'. (5 Marks) b) In RSA algorithm if p= 5, q = 11 and e =13 then what will be the value for d? (5 Marks) i. Calculate the value of n = p x q, where p and q are prime numbers ii. Calculate φ (n) = (p-1) x (q-1) iii. Consider d as public key such that φ (n) and d has no common factors iv. Consider e as private key such that (e x d) mod φ (n) = 1 v. Cipher text c = message i.e. m^d mod n vi. Message m = cipher text i.e. c^e mod n	10
3.	Evaluate and verify the signature using Digital signature algorithm for the following inputs. p = 11, q = 5, w = 20, h = 2, x = 3, k = 3	10
4.	Explain the password controls in place for Banking Transaction Management and access to critical applications. Examine the factors influencing the transaction failures and the approach to enhance the success rate of transaction by reducing the illegal activities carried out during the transaction management.	10
5.	Consider the threat of "theft/breach of proprietary or confidential information held in key data files on the system." One method by which such a breach might occur is the accidental/deliberate e-mailing of information to a user outside to the organization. A possible countermeasure to this is to require all external e-mail to be given a sensitivity tag in its subject and for external email to have the lowest sensitivity tag. Identify the components and architecture that would be need to do this?	10