Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110
(An Autonomous Institution, Affiliated to Anna University, Chennai)
Department of Computer Science and Engineering
Continuous Assessment Test – II
Question Paper

Degree & Branch	B.E Computer Science and Engineering				Semester	VI
Subject Code & Name	UCS1601 – Internet Programming				Regulation:	2018
Academic Year	2021-2022 (Even)	Batch	2019-2023	Date	29.04.2022	FN
Time: 90 Minutes 8:30 AM – 10:00 AM	Answer All Questions				Maximum: 50 Marks	

Part – A (6×2 = 12 Marks)

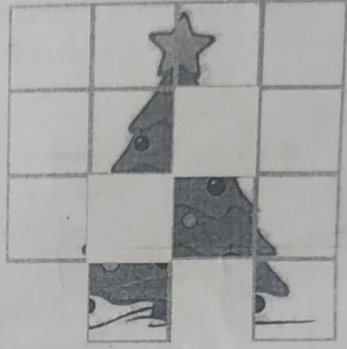|		
<K2>	1. Compare and contrast the Null and Undefined objects in Javascript	<CO2>
<K3>	2. Develop a javascript code that displays the given pre-initialized number array in ascending and descending order.	<CO2>
<K2>	3. Outline the responsibilities of web container.	<CO3>
<K2>	4. Show the directory structure to deploy a servlet.	<CO3>
<K2>	5. Is servlet handled by light weighted java threads or by heavy weighted operating system processes? Justify your answer.	<CO3>
<K2>	6. Illustrate how cookie is helpful in maintaining the state of the user.	<CO3>

Part – B (3×6 = 18 Marks)

<K3>	7. Develop a javascript code that shows the implementation of toggling the visibility of the password. On pressing the checkbox labeled "Display password", it should be visible. Else it should be invisible.	<CO2>
<K2>	8. Explain with a javascript code to find the difference between the two dates that are given as inputs. The output should be displayed in two formats. (i) No. of years. (ii). No. of days.	<CO2>
<K2>	9. Explain cookie-based session tracking mechanism with suitable code snippets.	<CO3>

Part – C (2×10 = 20 Marks)

<K4>	10. Construct a gaming application which solves the given puzzle. The original image is split into equal sized pieces. Those pieces are jumbled and stored in an array. The player is allowed to drag the pieces and place them appropriately to recreate the original image. Examine the technologies to be used to implement the application. Original Image Jumbled pieces	<CO2>

(OR)

<K4>	11. Develop a system for the "Raising Star" Tennis Academy. The system stores a set of international sports player images, in "Player_images" array. Their corresponding names are stored in "Player_names" array. When a button is clicked, the system randomly displays an image and the name of the player from the above-mentioned arrays. Examine the technologies and implement the application for the given scenario.	<CO2>

<K3>	12. Develop a web application using servlets for the Maruti Suzuki showroom. The showroom webpage displays a **TestDrive** form to read the customer's name, age, phone number and car model. On submitting the **TestDrive** form, the details are stored in a database. The admin should be able to retrieve the customer information who have taken the test drive by providing the phone number. On submitting the phone number, invoke another servlet to display the customer information.	3>

(OR)

<K3>	13. Develop a web application using servlets for the World Cube Association. The association is planning to conduct the Rubrik's cube competition. The webpage displays a registration form that reads the participant's name, age, phone number and cube size. On submitting the registration form, the details are stored in a database. Make use of HTTPSession to print the number of visitors of that webpage.	<CO2>

40x4 copies

Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Department of Computer Science and Engineering

Continuous Assessment Test – II

Question Paper

Degree & Branch	BE (CSE)				Semester	VI
Subject Code & Name	UCS1602 – Compiler Design				Regulation:	2018
Academic Year	2021-2022	Batch	2019-2023	Date	10-05-2022	FN
Time: 90 Minutes 8.30 – 10.00 am	Answer All Questions				Maximum: 50 Marks	

Part – A (6×2 = 12 Marks)

<KL1>	What is LR(k) parser?	<CO2>
<KL1>	How precedence and associativity are handled by YACC compiler?	<CO2>
<KL2>	Explain handle pruning with suitable example.	<CO2>
<KL2>	Show FIRST & FOLLOW for the grammar. $S \rightarrow ABBA$ $A \rightarrow a \mid \varepsilon$ $B \rightarrow b \mid \varepsilon$	<CO2>
<KL1>	What is rule for finding closure{I}, where I is the set of items ?	<CO2>
<KL2>	Explain the structure of LR parsing table.	<CO2>

Part – B (3×6 = 18 Marks)

<KL3>	7. Consider the grammar G for declaration statements. G: $S \rightarrow TL$; $T \rightarrow int \mid float$ $L \rightarrow L,id \mid id$ Develop a Syntax checker to recognize the following statements by writing suitable LEX & YACC specifications. int a,b,c; char e,f; float h	<CO2>
<KL2>	8. Explain error recovery in predictive parsing with suitable examples.	<CO2>
<KL2>	9. Write the LR parsing algorithm.	<CO2>

Part – C (2×10 = 20 Marks)

\<KL3\>	10. Construct CLR parsing table for the grammar. $E \rightarrow E + T \mid T$ $T \rightarrow TF \mid F$ $F \rightarrow F^* \mid a \mid b$	\<CO2\>
	(OR)	
\<KL3\>	11. Construct LALR parser for the grammar and show that the grammar is not LALR(1). $S \rightarrow Aa \mid bAc \mid Bc \mid bBa$ $A \rightarrow d$ $B \rightarrow d$	\<CO2\>
\<KL3\>	12. Construct Predictive parsing table for the given grammar and parse the sentence *(a,a)* $S \rightarrow a \mid \uparrow \mid (T)$ $T \rightarrow T , S \mid S$	\<CO2\>
	(OR)	
\<KL3\>	13. Construct SLR parser for the grammar G. Parse the string *int id,id* $G: S \rightarrow TL;$ $T \rightarrow int \mid float$ $L \rightarrow L,id \mid id$	\<CO2\>

Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110
(An Autonomous Institution, Affiliated to Anna University, Chennai)
Department of Computer Science and Engineering
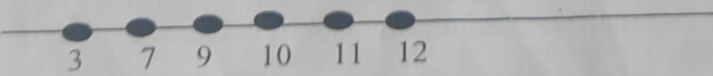### Continuous Assessment Test – II
Question Paper

Degree & Branch	B.E. & CSE				Semester	VI
Subject Code & Name	UCS1603 & INTRODUCTION TO MACHINE LEARNING				Regulation:	2018
Academic Year	2021-2022	Batch	2019-2023	Date	04.05.2022	FN
Time: 90 minutes (8.30-10.00 AM)		Answer All Questions			Maximum: 50 Marks	

Part – A (6×2 = 12 Marks)

<K1>	1. List any two applications of supervised learning using backpropagation algorithm.	<CO2>
<K1>	2. How the error is calculated from the misclassified samples in SVM?	<CO2>
<K3>	3. Assume X = [−3, −2, 0, 1, 3]. If X maps to higher dimension using quadratic function, then the X is	<CO2>
<K1>	4. What is the need of ensemble algorithm?	<CO3>
<K3>	5. Mr.Paul intends to buy a house in Chennai and he wants to analyze the price of the house. Can you help him by using suitable ML algorithm to predict the price? Justify your choice of the algorithm.	<CO2>
<K3>	6. Find the information gain of the following data set S={s1, s2, s3, s4} where s1=false, s2=true, s3=false, s4=true F={f1, f2} where f1={s1, s2} and f2={s3, s4} using appropriate formulas.	<CO3>

Part – B (3×6 = 18 Marks)

<K3>	7. Given a set of points as shown below. The data points 3 and 7 belong to class 1 and data point 12 belong to class 2. 3 7 9 10 11 12 Make use of SVM concept to find the value "x" at which the decision line crosses. And also find the values of "w" and "b" in the objective function.	<CO2>
<K3>	8. Solve the given problem using Linear Regression and find the Sum of Squared error with procedure and equations. X = [1, 2, 3, 4, 5] Y = [1, 3, 2, 3, 5]	<CO2>
<K2>	9. Compare the ensemble learning algorithms: Random forest versus Boosting.	<CO3>

Part – C (2×10 = 20 Marks)

<K2>	10. Explain the structure of MLP network with backpropagation algorithm by assuming the layers as I, H, O with weights as W_{ij} and V_{jk} between the layers.	<CO2>

(OR)

<K2>	11. Explain the objective functions of SVM (maximization, minimization) in primal form and derive the dual formulation using KKT conditions and Lagrangian multiplier for both objective functions.	<CO2>

<K3>	12. Construct the decision tree for the dataset given in the below table. Use the impurity functions: Entropy and Information gain to draw the first level tree representation.	<CO3>

Day	Outlook	Temp	Humidity	Wind	Play
1	Overcast	Hot	High	Weak	No
2	Sunny	Hot	High	Strong	No
3	Overcast	Hot	High	Weak	Yes
4	Rain	Mild	High	Weak	Yes
5	Rain	Cold	Normal	Weak	Yes
6	Rain	Cold	Normal	Strong	No
7	Overcast	Cold	Normal	Strong	Yes
8	Sunny	Mild	High	Weak	No
9	Sunny	Cold	Normal	Weak	Yes
10	Rain	Mild	Normal	Weak	Yes
11	Sunny	Mild	Normal	Strong	Yes
12	Overcast	Mild	High	Strong	Yes
13	Overcast	Hot	Normal	Weak	Yes
14	Rain	Mild	High	Strong	No

(OR)

<K3>	13. Construct the decision tree for the dataset given in the below table. Use the impurity function: Gini Index to draw the final decision tree and its corresponding rules in First Order Logic form.	<CO3>

Past Trend	Open Interest	Trading Volume	Return
Positive	Low	High	Up
Negative	High	Low	Down
Positive	Low	High	Up
Positive	High	High	Up
Negative	Low	High	Down
Positive	Low	Low	Down
Negative	High	High	Down
Negative	Low	High	Down
Positive	Low	Low	Down
Positive	High	High	Up

Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110
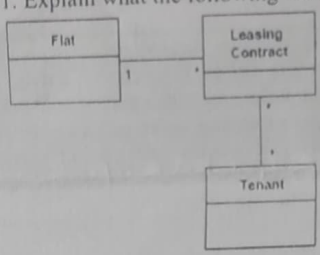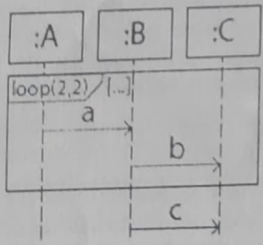(An Autonomous Institution, Affiliated to Anna University, Chennai)
Computer Science and Engineering
Continuous Assessment Test – II
Question Paper

Degree & Branch	B.E. CSE				Semester	6
Subject Code & Name	UCS1604 - Object Oriented Analysis and Design				Regulation:	2018
Academic Year	2021-2022	Batch	2019-2023	Date	5/5/2022	FN
Time: 90 Minutes	Answer All Questions				Maximum: 50 Marks	

Part – A (6×2 = 12 Marks)

<K2>	1. Explain what the following class diagram represents?	<CO2>
<K2>	2. Interpret the possible traces in the following sequence diagram.	<CO3>
<K1>	3. Define abstract conceptual classes.	<CO2>
<K2>	4. Outline the difference between sequence diagram and communication diagram.	<CO3>
<K1>	5. When should the Component and deployment diagrams be used?	<CO3>
<K2>	6. Illustrate the state machine diagram for the telephone conversation.	<CO3>

Part – B (3×6 = 18 Marks)

<K3>	7. Make use of the following diagram to evaluate the value of x after the occurrence of the event chain given below. Justify your solution.	<CO3>

\<K2\>	8. Explain the UML package diagram with a suitable example.	\<CO3\>
\<K2\>	9. Explain in detail the relationships used in class diagram with an example.	\<CO2\>

Part – C (2×10 = 20 Marks)

\<K3\>	10. Model a class diagram for the following scenario by identifying the classes and their associations: Demonstrate a student class with the following attributes: 1) Reg No. 2) Name of the student 3) Marks in subject1, subject2, subject3 4) Total Marks. The total of three subject marks must be calculated only when the student pass in all the subject. The pass marks for each subject is 50. If a candidate fails in any one of the subjects, his total marks must be declared as 0.	\<CO2\>

(OR)

\<K3\>	11. Identify the use cases to relate the sequence diagram for the following case study: Clients may take money from their accounts, deposit money or ask for their current balance. All these operations are accomplished using either automatic teller machines (ATM) or counter tellers. Transactions on an account may be done by cheque, standing order or using the teller machine and card. There are two kinds of account: savings accounts and current accounts. Savings accounts give interest and cannot be accessed by the automatic tellers. When a cheque is deposited it must be cleared before the funds can be used by the depositor.	\<CO2\>
\<K3\>	12. Model the activity diagram for the given scenario. The buyer finds a house and makes an offer. The seller may accept the offer or may make a counter offer. If the seller makes a counter offer, the buyer may accept the counter offer or make another counter offer. This repeats until either the buyer or seller rejects the counter offer or accepts the counter offer. After an offer or counter offer has been accepted, the buyer simultaneously applies for a loan and a home inspector inspects the home. If the loan is approved and if the inspections pass, the escrow officer conducts a title search. If the seller actually holds the deed, the escrow officer transfers the deed to the buyer and transfers the buyer's money to the seller.	\<CO3\>

(OR)

\<K3\>	13. Model an Interaction diagram for the following case study (for the main success scenario): The SEVLabs Institute has been recently setup to provide state-of-the-art research facilities in the field of Software Engineering. Apart from research scholars (students) and professors, it also includes quite a large number of employees who work on different projects undertaken by the institution. As the size and capacity of the institute is increasing with the time, it has been proposed to develop a Library Information System (LIS) for the benefit of students and employees of the institute. LIS will enable the members to borrow a book (or return it) with ease while sitting at his desk/chamber. The system also enables a member to extend the date of his borrowing if no other booking for that particular book has been made. For the library staff, this system aids them to easily handle day-today book transactions. The librarian, who has administrative privileges and complete control over the system, can enter a new record into the system when a new book has been purchased, or remove a record in case any book is taken off the shelf. Any non-member is free to use this system to browse/search books online. However, issuing or returning books is restricted to valid users (members) of LIS only.	\<CO3\>

Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110
(An Autonomous Institution, Affiliated to Anna University, Chennai)
Computer Science and Engineering
Continuous Assessment Test –II
Question Paper

Degree & Branch	B.E CSE				Semester	VI
Subject Code & Name	UCS1625 – Foundations of Data Science				Regulation:	2018
Academic Year	2021-2022	Batch	2019-2023	Date	06-05-2022	FN
Time: 08:30 AM to 10: 00 AM	Answer All Questions				Maximum: 50 Marks	

Part – A (6×2 = 12 Marks)

KL1	1. When does "*mean*" becomes equal to "*median*"?	CO2
KL1	2. Outline the importance of mean.	CO2
KL3	3. The scores for the survey are 9, 7, 10, 8, 9, 7, 8, and 9. Apply the steps for computing the standard deviation for the given data.	CO2
KL2	4. Distinguish deterministic and systematic sampling.	CO2
KL2	5. Explain the least square method for the regression line.	CO2
KL2	6. Compare soft with hard margin SVM.	CO3

Part – B (3×6 = 18 Marks)

KL2	7. What is bootstrap sampling? Explain bootstrap sampling and prove that "the results of resampling is close to the results of population" with your own example.	CO2
KL4	8. Consider 13,825 flights as population. Draw random samples with replacement for the feature flight delays. Analyze whether the empirical distribution of a random sample resembles the distribution of the population from which the sample was drawn. Sample flight data is given below.	CO2

Date	Flight Number	Destination	Delay(minutes)
6/1/15	73	HNL	257
6/1/15	217	EWR	28
6/1/15	237	STL	-3
6/1/15	250	SAN	0
6/1/15	267	PHL	64

KL3	9. The table contains the following variables for mother-baby pairs: the baby's birth weight in ounces, the number of gestational days, the mother's age in completed years, the mother's height in inches, pregnancy weight in pounds, and whether the mother smoked during pregnancy.	CO2

Birth Weight	Gestational Days	Maternal Age	Maternal Height	Maternal Pregnancy Weight	Maternal Smoker
120	284	27	62	100	False
113	282	33	64	135	False
128	279	28	64	115	True
108	282	23	67	125	True
136	286	25	62	93	False
138	244	33	62	178	False
132	245	23	65	140	False
120	289	25	62	125	False
143	299	30	66	136	True
140	351	27	68	120	False

Consider the feature Gestational Days as predictor variable and estimate the birth weight for the given 10 records in the baby table. Apply the prediction model to fit a straight line when there is linear association between number of gestational days and the birth weight.

Part – C (2×10 = 20 Marks)

KL2	10. What is the need for kernel function? Explain different kernel functions and its usage in classification of non-linear data with Support Vector Machine. [10]	CO3

(OR)

KL2	11. Explain Perceptron Learning Algorithm (PLA) for classification and regression problem.	CO3
KL3	12. Gregor Mendel the founder of the modern field of genetics, performed careful and large-scale experiments on plants to come up with fundamental laws of genetics. Many of his experiments were on varieties of pea plants. He formulated sets of assumptions about each variety; these are known as models. He then tested the validity of his models by growing the plants and gathering data. In a particular variety, each plant has either purple flowers or white. The color in each plant is unaffected by the colors in other plants. Mendel hypothesized that the plants should bear purple or white flowers at random, in the ratio 3:1. For every plant, there is a 75% chance that it will have purple flowers, and a 25% chance that the flowers will be white, regardless of the colors in all the other plants. To see whether his model was valid, Mendel grew 929 pea plants of this variety. Among these 929 plants, 705 had purple flowers. Use these data to perform a test of hypotheses and see if Mendel's model looks good.	CO2

(OR)

KL3	13. Hodgkin's disease is a cancer that typically affects young people. The disease is curable, but the treatment can be very harsh. The purpose of the trial was to come up with dosage that would cure the cancer but minimize the adverse effects on the patients.	CO2

The following table contains data on the effect that the treatment had on the lungs of 10 patients.

Height	Rad	Chemo	base	Month_15
164	679	180	160.57	87.77
168	311	180	98.24	67.62
173	388	239	129.04	133.33
157	370	168	85.41	51.28
160	468	151	67.94	79.26
170	341	96	150.51	80.97
163	453	134	129.88	69.24
175	529	264	87.45	56.48
185	392	240	149.84	106.99
178	479	216	92.24	73.43

The columns are:
- Height in cm
- A measure of radiation to the mantle (neck, chest, under arms)
- A measure of chemotherapy
- A score of the health of the lungs at baseline, that is, at the start of the treatment; higher scores correspond to more healthy lungs
- The same score of the health of the lungs, 15 months after treatment.

At a glance, you can see that the 15-month scores tend to be lower than the baseline scores – the sampled patients' lungs seem to be doing worse, 15 months after the treatment. Compute the drop in lung capacity by subtracting "months15" from "base" columns.

Apply Hypothesis Testing and prove / disapprove that the average drop is 0 in the entire population using bootstrap and 95% confidence interval.

****************ALL THE BEST************

Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam – 603 110

(An Autonomous Institution, Affiliated to Anna University, Chennai)
Department of Information Technology
Continuous Assessment Test – II
Question Paper

Degree & Branch	B. E - Common to CSE & ECE branches	Semester	VI
Subject Code & Name	UIT1042 – User Interface Design (Open Elective)		
Time: 90 Minutes Date: 09.05.2022 - FN	Answer All Questions	Maximum: 50 Marks	

(K1 – Remembering, K2- Understanding, K3- Applying, K4- Analyzing, K5- Evaluating, K6 – Creating)

CO1	Analyze and model requirements and constraints for the purpose of designing and implementing user interfaces for software applications		
CO2	Design and implement a user interface based on modelling or requirements specification		
CO3	Participate in a team to design and implement a user interface based on modelling or requirements specification.		

Part – A (5 × 2 = 10 Marks)

		K	CO	
1	Differentiate between tooltip from balloon tips.	K2	CO1	1.3.1
2	Write the different ways of selecting menu choices.	K1	CO1	2.2.1
3	Mention the possible screen distractions that can pave way for a bad UI design.	K1	CO2	1.4.2
4	Differentiate cascading and unfolding window design with an example.	K2	CO2	1.3.1
5	Give the usage of What's This? Button.	K2	CO1	1.4.2
6	List the mutually exclusive and non-exclusive choice controls.	K1	CO1	2.2.1

Part – B (3 × 6 = 18 Marks)

7	List the different types of list boxes and explain it with respect to online food ordering application.	K3	CO2	2.1.1
8	Elaborate on the guidelines to be followed in phrasing of menus during the development of system menus.	K1	CO1	2.2.1
9	Explain the Combination Entry/Selection control with diagram for a course registration application.	K3	CO2	2.1.1

Part – C (2 × 10 = 20 Marks)

10	Elaborate on different menu structures, functions of menus, content of menus, formatting options and phrasing the menu by considering a case study of a criminal record management system.	K3	CO2	2.1.1
	OR			
11	A UI team is assigned for designing the user interface of a new version of Indian government web facility that is used by taxpayers to make their income tax returns online. Mention the different types of graphical controls used for performing the task.	K3	CO3	2.1.1
12	"A customer wants to develop a portal for his shop to encourage their customers for online shopping. His customer can vary from young age to old age. He does not want to unsatisfy his customer to move between many pages and to type more. He needs a portal in such a way that it can also be accessed through keyboard also." Design a screen prototype to satisfy the customer's requirements and justify the components used.	K3	CO2	2.1.1
	OR			
13	What are the characteristics of windows and mention the ways to select the proper window style by choosing a case study. Also justify how to meet the window characteristics and the necessary components of windows for your case study.	K3	CO2	2.1.1