Daffodil International University
Faculty of Science & Information Technology
Final Examination, Fall 2022
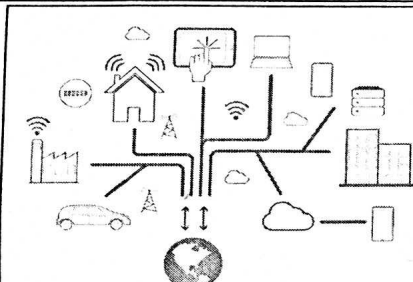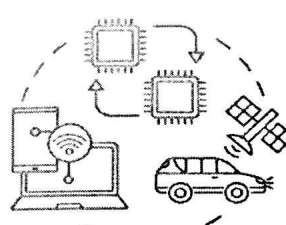**Course Code: CSE412   Course Title: Big Data and IoT**
Sections & Teachers: All   Batch: 53, 54

Time: 2:00 Hrs   **Marks: 40**

Answer ALL Questions
[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	**Illustrate** the life cycle of Big Data Analytics.	[5]	CO1
2.	a)	**Analyze** the MapReduce wordcount process to the following input: "The deepest night burning bright bright and night"	[5]	CO2
	b)	Let's say that, DIU administration requires 2500TB of space. But for performing this task they have a JBOD of 25 disks and each disk can store 9TB of data. In this case I. **Show** the number of data nodes required to store 2500TB of data. II. **Interpret** which communication protocol will be used for communicating with Name Node.	[5]	
3.	a)	 **Compare** the two systems A & B after identifying them.	[5]	CO3
	b)	Suppose, you have created a youtube channel. Here you post different types of educational video for the user. But there are very few subscribers. As a result, when you post a video, no one gets notification without the subscriber. I. **Determine** which IoT communication model is presenting the above scenario. II. **Justify** your answer with proper explanation and architecture.	[5]	
4.	a)	Consider package monitoring in a distribution system. The movements that occur to the package are reviewed here. If they exceed the threshold, an alarm is triggered. To detect these movements, the IoT system has gyroscope and	[10]	CO4

accelerometer sensors. The controller service uses Websocket API to send real-time data to the cloud, which is useful in real-time applications due to its low overhead. A cloud-based WebSocket-based service retrieves real-time data from IoT devices and stores it in a database. It retrieves it as required for analysis. The data is voluminous, i.e. large data, in this case. So data analysis is not possible locally, and control actions are activated using a mobile app or a web app based on the results of the analysis. Now answer the following questions.

I.	**Choose** the required IoT level for the above scenario.
II.	**Justify** Why you choose the IoT level (that you have mentioned in the Question **I**)
III.	**Explain** the architecture of your selected IoT level.

b)	**Explain** the different types of components used in IoT?	[5]	

Daffodil International University
Faculty of Science and Information Technology
Department of CSE
Final Examination, Semester: Fall 2022
Course Code: CSE 411   Course Title: Computer Architecture & Organization
Section: All

Time: 02:00H   Full marks: 40
Answer All the Questions. Figure in the right-side margin indicate full marks

1.	a.	Multiply the given unsigned binary numbers **1101*1010** and **demonstrate** the **AND** array for this multiplier.	[4]	CO2
	b.	Calculating exponentiation and trigonometric functions are harder to implement. **Illustrate** the technique which is used to solve this problem and show its working procedure in the pipeline processing where the input capacity is **4 words**.	[4]	
2.	a.	**Construct** the Pipeline for a situation where **instruction 4** is a conditional branch to **instruction 10**. Mention till when the **branch cannot be determined** and in which time unit **no instructions are completed** in the pipeline.	[4]	CO3
	b.	**Identify** the **Hazard** which will occur in the given instruction with Hazard Diagram: I_1: ADD R1, R2, R3 I_2: SUB R4, R1, R2	[4]	
	c.	Suppose you have **11 instructions** to process with **no-branch**. Assume that the instruction cycle time without pipeline is **7 milliseconds**. Now **identify** the **total time** required for a pipeline with **4 stages** to execute all the instructions and find out the **speedup factor**.	[2]	
3.	a.	**Discover** the performance factors with the memory hierarchy. State the Cache Read Operation with flowchart.	[4]	CO4
	b.	**Assume** you have a **Main Memory** which is size of **128 Byte** and a **Cache Memory** size of **16 Byte**. Each line of cache memory can hold **a block of 32 bits** at a time and each block **contain 4 data**. Now sketch the **Associative Mapping** from Cache to Main Memory with example of **Address Structure**. Also mention two **advantages and disadvantages** of Set-Associative Mapping.	[8]	
4.	a.	**Discover** the necessity of virtual memory and prepare the Address Translation technique of virtual memory with proper figures.	[4]	CO4
	b.	**Construct** transfer of a Paged Memory to Contiguous Disk Space (Swap in/out) with figure.	[4]	
	c.	**Analyze** the sharing process of virtual memory with proper diagrams.	[2]	

Daffodil International University
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination, Fall 2022
Course Code: CSE 412 , Course Title: Big Data and IoT
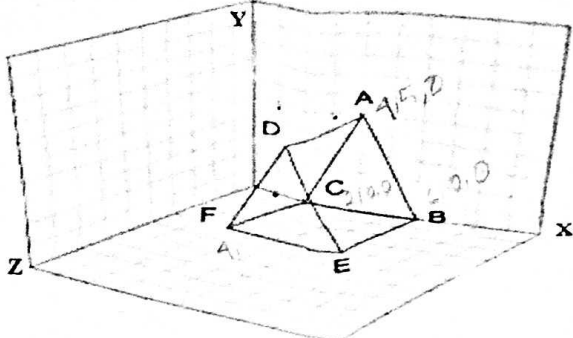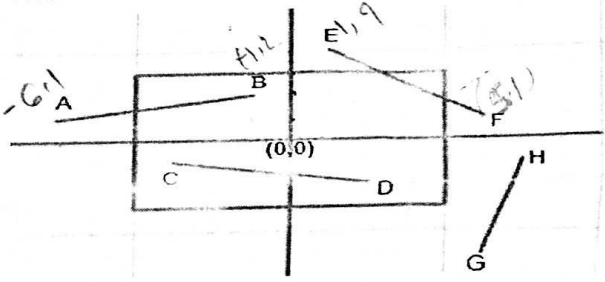Level: 4   Term: 1, 2   Batch: 54, 53

Time: 01:30 Hrs   Marks: 25

Answer ALL Questions [Optional]
[The figures in the right margin indicate the full marks and corresponding
course outcomes. All portions of each question must be answered sequentially.]

1.	a)	Illustrate the major components of a Pig execution environment?	[4]	CO1
	b)	Compare between Apache Sqoop and Flume.	[4]	
	c)	Explain how Apache Pig is different from MapReduce?	[4]	
2.	a)	Assume, you want to store a file "BIG.txt" in Hadoop cluster. The size of that file is 2GB. Now, answer the following questions: 1. How many input splits would HDFS create? 2. What would be the size of each input split? 3. What will be the minimum and maximum number of blocks Hadoop can create?	[5]	CO2
	b)	Classify core components of Hadoop and the various Hadoop daemons with their roles in a Hadoop cluster.	[4]	
	c)	Inspect how YARN allocates resources to an application with the help of its architecture.	[4]	

Daffodil International University
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Examination, Fall 2022
Course Code: CSE421, Course Title: Computer Graphics
Level: 4   Term: 1, 2   Batch: 53, 54
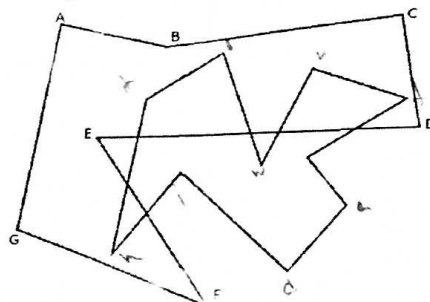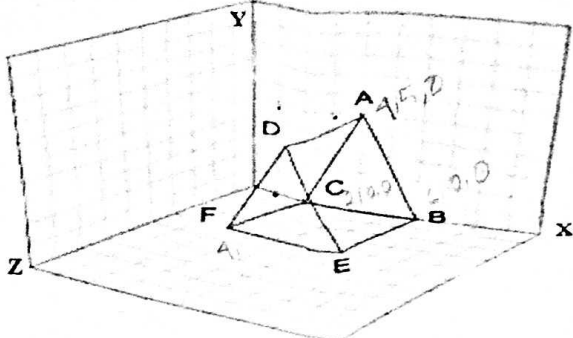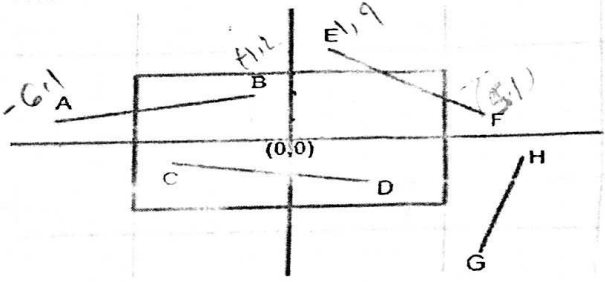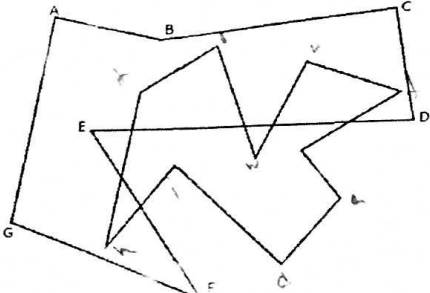
Time: 02:00 Hours

Marks: 40

Answer ALL Questions
[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a) **Explain** visual defects occur in Figure-A. **How** can you remove this jagged image in the context of Computer Graphics?	[5]	CO1
	Figure- A		
	b) Rubel wants to be a graphics designer. Recently, He opened a profile in an online platform freelancer.com. One of the clients requests him to design a logo for his new company. Now, Rubel worries about the uses of different colors. Can you interpret Rubel to select **which** color model is appropriate for electronic display and why?	[5]	
2.	a) **Analyze** the following figure-B, the right-side pentagon is the original object whereas the left one is the output after applying two dimensional transformations on it. Now, discover which transformations have been applied on it and properties of those transformations.		CO2
	Figure-B		

	b) From the following figure- C i. **Identify** the coordinates of each point. ii. **Discover** new object after rotate the cube 55 degrees along the Z axis. Fig- C	**7**	
3.	Now, I. **Identify** the type of each of the lines using 4-bit code. II. **Apply** the proper clipping algorithm for each of the clipping candidates. 	**10**	**CO3**
4.	In the following figure, **ABCDEFG** is the clipping window where the other polygon is the clipping object. Now, **Construct** the clipped polygon using the best fit algorithm according to your opinion and justify your answer. **Instructions:** * Perform an anticlockwise direction whose ID is EVEN and clockwise direction whose ID is ODD. ** Here, Vertices of clipping polygon will be your name of small Letter. Do not use the same character. [Example: If your name is **"tarekul adnan"** then Vertices of clipping polygon will be **tarekuldn** *** Add Digits (1,2,3, …..) or delete if the number of vertices of polygon did not match with your name's character. 	**10**	**CO3**

		7	

b) From the following figure- C
i. **Identify** the coordinates of each point.
ii. **Discover** new object after rotate the cube 55 degrees along the Z axis.

Fig- C

3.	Now,	10	CO3

I.   **Identify** the type of each of the lines using 4-bit code.

II. **Apply** the proper clipping algorithm for each of the clipping candidates.

4.	In the following figure, **ABCDEFG** is the clipping window where the other polygon is the clipping object. Now, **Construct** the clipped polygon using the best fit algorithm according to your opinion and justify your answer.	10	CO3

Instructions:
* Perform an anticlockwise direction whose ID is EVEN and clockwise direction whose ID is ODD.
** Here, Vertices of clipping polygon will be your name of small Letter. Do not use the same character.
[Example: If your name is **"tarekul adnan"** then Vertices of clipping polygon will be **tarekuldn**
*** Add Digits (1,2,3, …..) or delete if the number of vertices of polygon did not match with your name's character.

Daffodil International University
Faculty of Science & Information Technology
Final Examination, Fall 2022
Course Code: CSE331 Course Title: Compiler Design
Sections & Teachers: L3T2 L4T1 Batch-56 Batch-54

Time: 2:00 Hrs   Marks: 40

Answer ALL Questions [Optional]
[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	Produce LR (0) automation and Canonical table for the following grammar. $A \rightarrow A*BA \mid xC\#y$ $B \rightarrow z,BC \mid CuA$ $C \rightarrow BvA \mid *zD$ $D \rightarrow xy,$	[6]	CO2
	b)	Apply Left Factoring on the following: $E \rightarrow education \mid educational \mid educationist \mid edu.bd \mid edu \mid A$ $A \rightarrow a \mid b \mid \varepsilon$	[4]	
2.	a)	If you find a Left recursion problem, Explain why? And convert it into the right form. $EDU \rightarrow BRN$ $BRN \rightarrow a\ KNG \mid a\ MEM \mid a\ UND \mid BRN\ c$ $KNG \rightarrow b\ KNG\ MEM \mid f$ $MEM \rightarrow g \mid \varepsilon$ $UND \rightarrow d \mid \varepsilon$	[4]	CO3
	b)	Construct LL(1) Parsing Table from the given grammar in 2 (a)	[6]	
3.	a)	Consider the following expression: $z = (b\wedge c/d) + (b\wedge c*t/f) * b - (b+b+b) \wedge (c-d)$ i. Write the three address code for the expression. ii. Write the quadruple for the expression iii. Write the triple for the expression.	[6]	CO4
	b)	Draw the **Directed Acyclic Graph (DAG)** for the 3(a).	[4]	

4.	a)	Write short notes on the following topics	[4]	
		i. YACC		
		ii. Dead Code Elimination		
		iii. Copy Propagation		

	b)	Consider the following three address codes and answer the questions.	[6]	

1. i=a*n
2. n
3. t1=4/n
4. goto(2)
5. t4=4*j
6. t5=a[t4]
7. t2=4*i
8. t3=a[t2]
9. if t3<v goto (7)
10. goto (13)
11. v=a[t1]
12. i=i+1
13. if t5>v goto(9)
14. if i>=j goto(26)
15. t6=4*i
16. x=a[t6]
17. t7=4*i
18. if j=1; goto (27)
19. t9=a[18]
20. a[t7]= t9
21. t10=4*j; goto (24)
22. a[t10]=x
23. goto(2)
24. t11=4*i
25. x=a[t11]
26. t12=4*i
27. goto(2)
28. t12=4*i
29. t17=4*i
30. goto (24)
31. t19=a[t18]
32. a[t17]=t19
33. t20=4*j
34. t11=4*n goto (33)
35. goto(12)
36. if t3<v goto (2)
37. goto (24)
38. v=a[t21]
39. i=i+1
40. t22=4*i
41. t23=a[t2]
42. if t5>v goto (9)
43. if i>=j goto (39)
44. j=a*m
45. goto (24)
46. goto (15)

CO5

i. Which lines of the above code are leader instructions by the leader selection rule 2? (Write down the numbers only)

ii. Which lines of the above code are leader instructions by the leader selection rule 3? (Write down the numbers only)

iii. How many basic blocks are present in the above code?

iv. Is there any instruction lines which are selected as leader more than 3 times?

Daffodil International University
Faculty of Science & Information Technology
Final Examination, Fall 2022
Course Code: CSE414: Course Title: Web Engineering
Sections & Teachers: All

Time: 2:00 Hrs   Marks: 40

Answer ALL Questions
[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	Utilize the PHP code that would be saved in the database to process the order form. The user can order two categories products at a time. You should display the ordered products list. Your code should also compute the total cost of the order and shipping cost added to the order .The user can search from the webpages to the order. If the order is done, also print a "Thank you for your order!" message at the bottom of your output. (Note: Don't forget to design a user-friendly form for this particular scenario).	15	CO4
	b)	Utilize the JavaScript code to add behavior to the following page that has a user interface for a basic vocabulary quiz. The quiz data comes from user. When the user clicks a button to guess the definition, display an alert message of either "You are correct" or "You are incorrect", and then once the alert box is closed, start a new quiz by fetching a new word and displaying it to the user. The relevant HTML design page is the following: User Input : [ ] Display : [ ] [Click]	15	
2.	a)	What are the three components of MVC? How do MVC Frameworks work? Explain with an example.	05	CO1
	b)	What is Project Management process and what is the most crucial factor in Project Management?	05	

Best Wishes!