

University of Engineering and Technology Lahore, New Campus

Mid Term Examination

Course Title: Technical Writing and Presentation Skills

Course Code: 221

Total Marks: 30

Time allowed: 1 hour &45 mins

Student Name: M.Ammar Yasir

Registration Number: 604

Answer the following questions. All questions carry equal marks.

Q1. Explain the writing process of technical communication and provides its stages in detail. (10)	CLO1
Q2. Write a Memo calling a meeting. Provide an agenda. (10)	CLO2
Q3. You are the director of a software house. A delegation from Microsoft is visiting your office in the coming week. Write an email to your office manager informing him about the visit of foreign delegation and asking him to do the necessary arrangements. (10)	CLO2



EXAMINATION: Mid Term (Fall 2020) Department of computer science

SUBJECT:	MA-256 Probability and statistical processes	Time Limit: 90 mins	Total Marks: 30
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NOTE: Attempt all the questions

Q. No.	QUESTIONS	CLOs Mapping /marks																				
1.	<p>a) The area sown in <i>Rabi Crop</i> is as follows: Prepare a Pie-chart.</p> <table border="1"> <tr> <td>Wheat</td> <td>106</td> <td>lakh acres</td> </tr> <tr> <td>Gram</td> <td>30</td> <td>lakh acres</td> </tr> <tr> <td>Barley</td> <td>15</td> <td>lakh acres</td> </tr> <tr> <td>Pulses</td> <td>10</td> <td>lakh acres</td> </tr> <tr> <td>Fodder</td> <td>25</td> <td>lakh acres</td> </tr> <tr> <td>Other crops</td> <td>14</td> <td>lakh acres</td> </tr> </table> <p>b) Calculate the per cent contribution of each crop to the total <i>Rabi</i> crops.</p>	Wheat	106	lakh acres	Gram	30	lakh acres	Barley	15	lakh acres	Pulses	10	lakh acres	Fodder	25	lakh acres	Other crops	14	lakh acres	CLO1 (10)		
Wheat	106	lakh acres																				
Gram	30	lakh acres																				
Barley	15	lakh acres																				
Pulses	10	lakh acres																				
Fodder	25	lakh acres																				
Other crops	14	lakh acres																				
2.	<p>The weight of the 40 male students at a university are given in the following frequency table:</p> <table border="1"> <tr> <td>Weight</td> <td>118-126</td> <td>127-135</td> <td>136-144</td> <td>145-153</td> <td>154-162</td> <td>163-171</td> <td>172-180</td> </tr> <tr> <td>Frequency</td> <td>3</td> <td>5</td> <td>9</td> <td>12</td> <td>5</td> <td>4</td> <td>2</td> </tr> </table> <p>Calculate Median, Mean Deviation, 67th Percentile, 2nd Quartile and Coefficient of Variance.</p>	Weight	118-126	127-135	136-144	145-153	154-162	163-171	172-180	Frequency	3	5	9	12	5	4	2	CLO1 (10)				
Weight	118-126	127-135	136-144	145-153	154-162	163-171	172-180															
Frequency	3	5	9	12	5	4	2															
3.	<p>Calculate b_1 and b_2 from the following data and interpret it according to the findings.</p> <table border="1"> <tr> <td><i>x</i></td> <td>10-12</td> <td>12-14</td> <td>14-16</td> <td>16-18</td> <td>18-20</td> <td>20-22</td> <td>22-24</td> <td>24-26</td> <td>26-28</td> </tr> <tr> <td><i>f</i></td> <td>3</td> <td>30</td> <td>110</td> <td>218</td> <td>275</td> <td>222</td> <td>108</td> <td>32</td> <td>2</td> </tr> </table>	<i>x</i>	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	<i>f</i>	3	30	110	218	275	222	108	32	2	CLO1 (10)
<i>x</i>	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28													
<i>f</i>	3	30	110	218	275	222	108	32	2													



EXAMINATION: Final Term (Fall 2020) Department of Computer Science

SUBJECT: MA-256 Probability and
statistical processes | Time Limit: 120 mins | Total Marks: 50

NOTE: Attempt all the questions

2019-CS-604

Q. no.	QUESTIONS	Marks																				
1.	<p>In a firm, 20 percent of the employees have accounting background, while 5 percent of the employees are executives and have accounting background. If an employee has an accounting background, what is the probability that the employee is an executive?</p>	(10)																				
2. ✓	<p>The incidence of defective items in 200 samples of 6 is shown in the following table:</p> <table border="1"> <thead> <tr> <th>No. of defectives per sample</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>No. of samples</td> <td>36</td> <td>70</td> <td>61</td> <td>25</td> <td>7</td> <td>1</td> <td>0</td> <td>200</td> </tr> </tbody> </table> <p>Assuming these results follow a binomial distribution, compute the theoretical binomial probabilities and frequencies.</p>	No. of defectives per sample	0	1	2	3	4	5	6	Total	No. of samples	36	70	61	25	7	1	0	200	(10)		
No. of defectives per sample	0	1	2	3	4	5	6	Total														
No. of samples	36	70	61	25	7	1	0	200														
3. a	<p>Assume that the probability of being killed in an accident in a coal mine during a year is $\frac{1}{1400}P$</p> $q = 1 - p$ <p>calculate the probability that in the mine employing 350 miners, there will be at least one fatal accident in a year.</p>	(10)																				
3. b	<p>A soft drink machine is regulated so that it discharges an average of 200 milliliters per cup. If the amount of drink is normally distributed with a standard deviation equal to 15 millimeters.</p> <p>a) what fraction of the cups will contain more than 240 milliliters?</p> <p>b) what is the probability that a cup contains between 191 and 209 milliliters?</p> <p>c) how many cups will likely overflow if 230 milliliters cups are used for the next 1000 drinks?</p> <p>d) below what value do we get the smallest 25% of the drinks?</p>	(10)																				
4. ✓	<p>Find coefficient of correlation and obtain regression line of accident rate on traffic density from the following data:</p> <table border="1"> <thead> <tr> <th>Traffic Density</th> <th>30</th> <th>35</th> <th>40</th> <th>45</th> <th>50</th> <th>60</th> <th>70</th> <th>80</th> <th>90</th> </tr> </thead> <tbody> <tr> <th>Accident Rate</th> <td>2</td> <td>4</td> <td>5</td> <td>5</td> <td>8</td> <td>15</td> <td>24</td> <td>30</td> <td>32</td> </tr> </tbody> </table>	Traffic Density	30	35	40	45	50	60	70	80	90	Accident Rate	2	4	5	5	8	15	24	30	32	(10)
Traffic Density	30	35	40	45	50	60	70	80	90													
Accident Rate	2	4	5	5	8	15	24	30	32													
5. ✓	<p>Fit a curve $Y = aX^b$ to the following data:</p> <table border="1"> <thead> <tr> <th>X</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr> <th>Y</th> <td>1200</td> <td>900</td> <td>600</td> <td>200</td> <td>110</td> <td>50</td> </tr> </tbody> </table>	X	1	2	3	4	5	6	Y	1200	900	600	200	110	50	(10)						
X	1	2	3	4	5	6																
Y	1200	900	600	200	110	50																

Final Term Examination FALL 2020

Course Title: Technical Writing and Presentation Skills

Course Code: 221

Total Marks: 30

2019-CS-604

Time allowed: 90 Mins

Answer the following questions. All questions carry equal marks.

<p>Q1. What is the purpose of a proposal? Explain the typical components or criteria for proposals.</p>	CLO3
<p>Q2. Write short answers to the following questions.</p> <p>1) What is a report? List the basic components/criteria of a report. 2) What are purposes of a report? 3) When do you write a progress report? 4) Explain the difference between 'formal' and 'informal' reports. 5) When do you write a lab report?</p>	CLO3
<p>Q3. What is a research report? Explain the unique aspects of reports in detail.</p>	CLO3



Department of Computer Science (New Campus)
University of Engineering & Technology, Lahore

Subject: Computer Organization (3rd Semester, 2019 Session) Final Term
and Assembly Language

Date: 19-03-2021

Time Allowed: 2 hours

Total Marks: 50

2019-CS-604

Q. No.	Question	Marks	CLO
1	<p>Explain the following instructions of the assembly language. In each case, give one example of usage.</p> <p>a. MUL b. IMUL c. CBW d. ADC e. SBB f. AAA g. DAS h. MOVS B i. CMPS W j. REP</p>	15	3
2	<p>A. What is recursion? Explain your answer by writing a program that recursively sums the integers 1 to n where n is an input parameter passed in ECX.</p> <p>B. Write a program using STACK that finds the last EVEN number in a doubleword array. For example, if the array is {2, 5, 8, 7, 1, 6, 9, 3} the program should return 6.</p>	7 8	2
3	<p>A. Write a program to count the Vowels (A, E, I, O, U) in a string. Assume that the given string contains uppercase letters only.</p> <p>B. Define a structure Point with two fields X and Y of type doubleword. Declare and initialize two variables of type Point. Now, declare a third point and initialize its X and Y by summing the Xs and, Ys of the two points, respectively.</p> <p>C. Write INLINE assembly code to calculate the cube of an integer. The integer value is passed to a C function.</p>	7 7 6	3



Department of Computer Science (New Campus)
University of Engineering & Technology, Lahore

Subject: Computer Organization (3rd Semester, 2019 Session) Mid Term
and Assembly Language

Date: 24-02-2021

Time Allowed: 90 minutes

Total Marks: 40

Student's Name: M.Ammar Yasin Reg: Number: 2019-CS-604

CLOs	Question	Marks
1	1. a) What are the basic components of a computer system? Briefly describe their functionality. b) What are CPU registers? Briefly describe the registers of x86-16 processor.	5+5
1	2. State whether the following statements are true or false? Explain your answer. a) An identifier cannot begin with a numeric digit. <u>F</u> b) Assembly language directives execute at runtime. <u>T</u> c) The RET instruction pops the top of the stack into the instruction pointer. <u>T</u> d) An Object file is produced by the Linker. <u>T</u> e) JMP is a conditional transfer instruction. <u>F</u> f) The LOOP instruction repeats a block of statements a specific number of times. <u>T</u> g) Stack Pointer register contains the address of the top element of the stack. <u>T</u> h) The TYPE operator returns a value of 4 for doubleword operands. <u>T</u> i) The PUSH instruction cannot have an immediate operand. <u>T</u> j) A nested procedure call occurs when a called procedure calls another procedure before the first procedure returns. <u>T</u>	10
2	3. Write the assembly language programs as instructed below. a) Write a program that calculates the following expression using 16-bit registers: $A = (A + B) - (C + D)$ b) Write a program with a loop and indexed addressing that calculates the sum of all the gaps between successive array elements. The array elements are doublewords, sequenced in increasing order. So, for example, the array {0, 2, 5, 9, 10} has gaps of 2, 3, 4, and 1, whose sum equals 10.	4+6
2	4. Write the assembly language program as instructed below. a) Write a program that finds the max number in an array of ten integers (16-bit). b) Write a procedure to find the factorial of an integer (16-bit) passed to it. In the main procedure, prompt the user to enter the integer. (Hint: Factorial of n is calculated as $n! = n * (n-1) * (n-2) * \dots * 1$)	5+5

EXAMINATION:

Quiz 1: 3rd Semester Computer Science Department Fall 2020

SUBJECT:

CS-212L: Data Structures and Algorithms Lab

Time Limit: 120

minutes

Total Marks:

Mapping CLOs:

CLO1, CLO2

Marks Obtain

1. Write a recursive C++ function to count the number of nodes in the linked list.
2. Design, Develop and Implement a Program in C++ for the following Operations on Singly Linked List (SLL) with header nodes (Section A)
 Operations on Doubly Linked List (DLL) with header nodes (Section A)
 a. Represent and Evaluate a Polynomial of single variable $p(x) = 6x^3 + 7x^2 + 9x + 9$
 b. Find the sum of two polynomials and store the result.
 Support the program with appropriate functions for each of the above operations

Skeleton code:

//set public and private members and you can add/modify the constructors and destructors
 class term {

```
    double coeff;
    int expo;
    term* next_term; // for SLL // for DLL
    term* prev_term; // for DLL
    term(){}
    term(double coeff=1, int expo=0) {
        this->coeff =coeff;
        this->expo = expo;
    }
};
```

```
term* first_term;
polynomial() {}
polynomial() {first_term=NULL;}
polynomial add(polynomial p) {// TO DO}
void main{
// using add function
p1.add(p2);
p3= p1.add(p2);
}
```

Sample Sorting function:

```
void sort() {
    int j;
    term *check_ptr;
    int count = getCount();
    term **arr = new term*[count];
    check_ptr = first_term;
    for(j=0; j<count; j++) {
        arr[j] = check_ptr;
        check_ptr = check_ptr->next_term;
    }
}
```

```

for(int i=0; i<count-1; ++i) {
    for(j=i+1; j<count; ++j) {
        if(arr[i]->expo == arr[j]->expo) {
            arr[i]->coeff+=arr[j]->coeff;
            delete arr[j];
            arr[j] = arr[count-1];
            --count; } } }
}

for(j=1; j<count; j++) {
    check_ptr = arr[j];
    int i = j-1;
    while(i>=0 && arr[i]->expo < check_ptr->expo) {

        arr[i+1] = arr[i];
        i--;
        arr[i+1] = check_ptr; }
    first_term = arr[0];
    for(j=0; j<count-1; j++) {
        arr[j]->next_term = arr[j+1];
        arr[j]->next_term=NULL;
        delete [] arr; } }

```

Sample Display function:

```

void display()
{
    term *current_term = first_term;
    while(current_term!=NULL)
    {
        if(current_term->expo==0)
            cout<<" " <<current_term->coeff<<"x^0" <<current_term->expo;
        else
        {
            cout<<" " <<current_term->coeff<<"x^"<<current_term->expo;
            current_term = current_term->next_term;
        }
    }
}

```



Department of Computer Science (New Campus) University of Engineering & Technology, Lahore

Subject: Introduction to Data Science
(6th Semester, 2019 Session)

Student's Name: Ammar Yasir

Mid Term

Total Marks: 30

Time Allowed: 75 Minutes

Reg. Number: 2019-CS-604

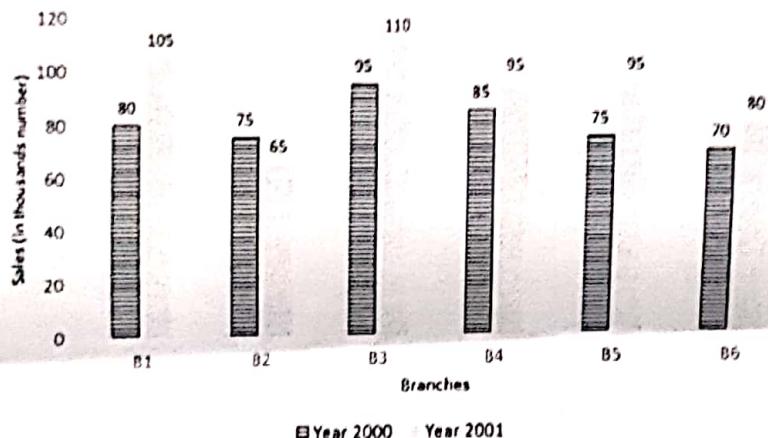
CLO-2

Question # 1

Describe the plots in Figure 1 and 2 below. Figure 1 shows the data of a departmental store where Figure 2 shows the data of music sale in a city.

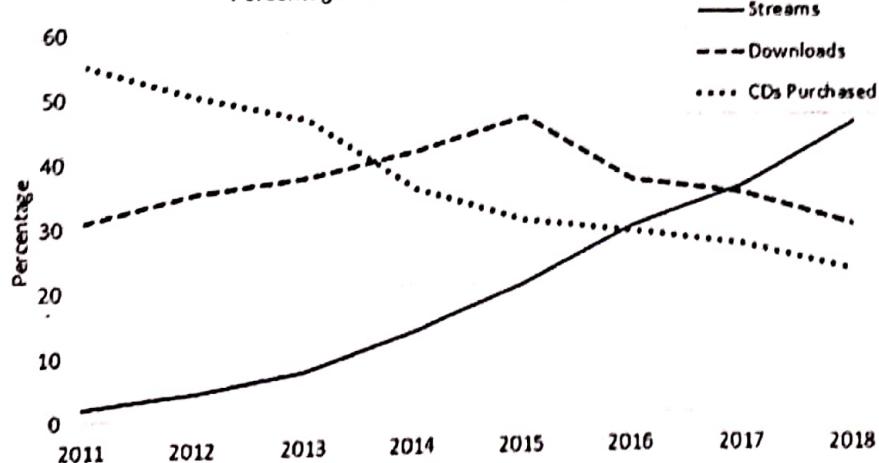
5+5
Marks

Sales of a Departmental Store in Year 2000 and 2001 in its Six Branches



(Figure 1)

Percentage of Total Music Sales by Method



(Figure 2)

CLO-1	<p>Question # 2</p> <p>a) A class scored 96, 20, 20, 45, 40, 32, 97, 100, 98, 45, 90, 35 and 91 in an exam. Comment on the skewness of this dataset.</p> <p>b) A student achieved 46, 69, 32, 60, 52, 41 marks in 6 subjects. Find the standard deviation of his marks.</p> <p>c) Two four-sided dice numbered 1, 2, 3, 4 were rolled and their faces were added to create a dataset of discrete random variable X as shown below. Find the probability distribution of X and draw its plot.</p> <table border="1"> <thead> <tr> <th>+</th><th>1</th><th>2</th><th>3</th><th>4</th></tr> </thead> <tbody> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr> <td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr> <tr> <td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr> <td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr> </tbody> </table>	+	1	2	3	4	1	2	3	4	5	2	3	4	5	6	3	4	5	6	7	4	5	6	7	8	3+3+4 Marks
+	1	2	3	4																							
1	2	3	4	5																							
2	3	4	5	6																							
3	4	5	6	7																							
4	5	6	7	8																							
CLO-1	<p>Question # 3</p> <p>a) Describe the difference between Univariate, Bivariate and Multivariate data analysis? What type of plots are used to present the results of these analysis?</p> <p>b) Differentiate between descriptive and inferential statistics. What are different measures of central tendency, and dispersion in descriptive statistics?</p>	5 + 5 Marks																									



2019 - CS - 604

Mid-Term Exam
Introduction to Human Computer Interaction (CS-302)

Term: Fall 2021

Time: 1.5 Hours

Date: November 8, 2021

Answer the following Questions

No.		CLO	Pts
Short Answers			
1 ✓	Identify any five different interaction style used to accommodate the dialog between user and computer and describe some paradigm shifts for interaction.	1	5
2 ✓	What is a conceptual model and how it is built up in a user's mind	1	5
A modern hotel has installed a sandwich making robot to supply room service sandwiches at any hour of the day. The hotel also has an automated delivery system that will take the completed sandwich to a specified room. You have been asked to program a software agent interface that guests can phone to order sandwiches.			
3 ✓	Write a short scenario describing how a guest would order a sandwich using your interface.	2	5
4 ✓	Provide a hierarchical task description of the sandwich ordering process. Note particularly where there might be choice points or alternative methods. Also explain your criteria for the level of decomposition used.	2	5
By default the Android Twitter app shows users notifications about all sorts of things like if they were mentioned in a tweet, if someone likes their tweet, if they get a new follower, ect. Some users like these notifications but others find them annoying. Figure 1 shows the sequence of screens necessary to disable notifications for "Mentions, replies, and photo tags". Answer the following questions about this sequence of screenshots:			
5	Use Heuristic Evaluation with 10 Heuristics to identify two positive and three negative aspects of this interaction sequence.	2	10



Department of Computer Science, New Campus
**UNIVERSITY OF ENGINEERING
AND TECHNOLOGY, LAHORE**



a) Home screen showing a post by Privacy Matters (@PrivacyMatters) and a post by MuleSoft (@MuleSoft). The Privacy Matters post discusses the TalkTalk hack and security differences between teenagers and hackers. The MuleSoft post is about SOA evolution.

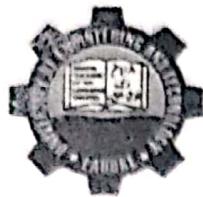
b) Profile screen showing a profile picture of Kam Vohra and a bio.

c) Settings screen showing various account and general settings options.

d) Notifications screen showing notification filters like 'Only people you follow' and 'Quality Filter'.

e) Mobile notifications screen showing notification types for Tweets, Mentions, Retweets, Likes, Polls, New followers, and Direct messages.

f) A modal dialog for 'Mentions, replies, and photo tags' with three options: 'Tailored for you' (selected), 'From anyone', and 'Off'. A 'CANCEL' button is at the bottom right.



Roll: 2019-CS-604

MIDTERM (FALL 2021)

Programming Languages

Time: 60 minutes

Marks: 45

Question 1:

(3+3+3+3)

Short Questions:

- i) Write variable name rules for high level programming languages ? [CLO-1]
- ii) Define Language. Differentiate between word and invalid string ? [CLO-1]
- iii) Programming languages rules defined by what methodology? [CLO-2]]
- iv) One instruction in programming languages composed of multiple rules. Justify it with example [CLO-2]

Question 2:

(8)

Design DFA of all string starting with 000 or ending with 00

[CLO-1]

Question 3:

[4*5+5]

Design a Programming Language comprised of given rules.

[CLO-2]

- A) Alphanumeric Identifier starting or ending with A or B.
- B) Floating numbers greater than 20
- C) Numbers greater than 310
- D) Operators {+=, -=, ==, =, /, *, ++, +, -}
- E) Space. {tab}

Write any two instruction of this language.



**Final Exam
Introduction to Human Computer Interaction (CS-302/)**

Term: Fall 2021

Time: 100 minutes

Date: December 29, 2021

Answer the following Questions

No.		CLO	Pts
	Short Answers		
1 ✓	What are the benefits of paper prototypes over computer prototypes?	3	6
2 ✓	Explain CRAP rules in Graphic Screen Design	3	6
3 ✓	What are different types of user testing approaches to evaluate an interface. Explain each	4	6
	You have been contacted by InDriver rider app to design and run an experiment to determine if InDriver app gives better performance than Uber rider app. Based on this scenario answer the following		
4	Design an experiment that will compare and contrast this new InDriver app with the Uber app. Provide details about the experimental design including hypothesis, Independent variables, dependent variable, study design, subjects, tasks etc.	4	6
5	Would you use a between subject or within subject design and why? Using hypothetical data, approve or disapprove the hypothesis for both cases.	4	6
	Figure 1 shows the sequence of screens necessary to disable notifications for "Mentions, replies, and photo tags". Answer the following questions about this sequence of screenshots:		
6	Analyze this sequence of interactions using GOMS to achieve the goal to disable notifications for "Mentions, replies and photo tags".	3	5
7	List out all the necessary actions and use them to construct the formula that would calculate the amount of time necessary to complete the actions in Figure 1. Assume the following variable names represent the time required to do each action. Please treat the person's finger pressing the screen the same way you would handle a mouse. <ul style="list-style-type: none">• p - point to an area on the screen• b - press a button (physical or virtual)• h - home the hand on a position on the screen• d - draw a straight line on the screen using a finger• k - type one character on the screen• m - mentally preparing for executing physical actions	3	5



University of Engineering and Technology, Lahore (New Campus)
Final Term Exam (Fall 2021)



Course Title:CS-411 Compiler Construction

Time: 1:30 Hrs

Total Marks: 35

Q No.	Description	CLO	Marks
1	Answer the given questions. a. Explain the error recovery techniques with the help of examples. b. What kind of conflicts occurred using shift-reduce parsing explain it with example and how it can be resolved? c. What is difference in LR(0), SLR and LR(1) parse table? d. What is the role of symbol table manager in compiler?	3	10
2	Write the three address code for the following c++ code. <pre>int fun(int x, int y) { int pow=1; for (int i=; i<=y; i++) { pow=pow*x; } return pow; }</pre>	2	5
3	Optimize the following code. <pre>int main() { int a,b,c,d; a=0; b=1; c=4; int x,y; for (int i=0; i<=c; i++) { d= (i+b) * (i+b) * (i+b) + (c*b); } return 0; }</pre>	2	5
4	Write the context free grammar for the given syntax specification of mini Language. $\Sigma = \{ \text{start}, \text{begin}, \text{end}, \text{num}, [,], \text{show}, (), +, *, =, \text{loop}, <, >, ==, \text{id}, \text{digit} \}$	3	5

Note: Use id to represent variable name and digit to represent value.

	Syntax Specification	Example		
	Program Block	start() begin end		
	Declaration Statement Only array declaration is allowed of num datatype of given size.	num a[2];		
	Assignment Statement Only two operators are allowed. Operator that can be used are (+, *, =)	a[1]=10; a[2]=a[1]*5; a[1]=3+2; a[2]=a[1]*a[2]		
	Display Statement Single value or multiple values.	show(a[0]); show(a[1],a[2]);		
	Repetition Structure	loop(boxexp) begin End		
	bolexp Only compare array values with operators (>, <, ==)			
	Sample program of mini language	start() begin num a[2]; loop(a[1] < a[2]) begin show(a[1]); a[1]=a[1]+1; end end		
5	Show that the grammar is LR(1). $S \rightarrow Aa \mid bAc \mid Bc \mid bBa$ $A \rightarrow a$ $B \rightarrow b$		3	5
6	Consider a context free grammar of signed fractional binary number used to represent the fraction part of given binary number. $N \rightarrow S \ 0 \cdot \ L$ $S \rightarrow - \mid +$ $L \rightarrow B \ L \mid B$ $B \rightarrow 0 \mid 1$ Define the semantic rule for the attributes to compute the fraction number into decimal value. i.e. given - 0.1101 will produce - 0.8125		2	5



Department of Computer Science, New Campus
**UNIVERSITY OF ENGINEERING
AND TECHNOLOGY, LAHORE**



MARKS: 50

FINAL TERM - PL

TIME: 1 hour 30 minutes

6*4 marks

Question 1: Short Questions

- I) ✓ Describe briefly the process of designing a custom programming language. [CLO-3]
II) ✓ Design parse tree for given expression which returns and assign 21 to n. [CLO-3]
- $n = m^*(5-2)$ $m = 7$
- III) ✓ Differentiate between scripting and high level languages. State two examples also. [CLO-4]
IV) How do frameworks effect processing time of high level language. [CLO-4]
V) ✓ Differentiate between interpretation and translation.
VI) On what parameters two different High level languages get compared ?

Question 2:

Computer Science Department is designing two softwares named learning management system and staff management system. Department needs staff management system at earliest with interactive UI for attendance, monitoring and management of staff. Learning management is a system which will be being consumed by thousands of students and everyone will looking for their respective data quickly. Which language/framework you will be choosing to develop each of the systems. Justify your answers.

7 marks. [CLO-3]

Question 3:

A language L1 consisting of identifiers and numbers and operators wants to provide following types of expressions and blocks. Design grammar for them and evaluate/validate any two of such expressions and blocks.

14 marks [CLO-4]

- a) Multiplication
- b) Summation
- c) Subtraction
- d) Division
- e) Precedence with parenthesis
- f) Modulus
- g) Assignment
- h) If and else blocks.
- i) Any valid combination of a to g.

Question 4:

Design PDA for $\{ a^{2n}b^{3n} \mid n \geq 0 \}$

5 marks [CLO-3]

2019-CS-604



University of Engineering and Technology, Lahore (New Campus)
Mid Term Exam (Fall 2021)



Course Title: CS-411 Compiler Construction

Time: 1:30 Hrs

Total Marks: 25

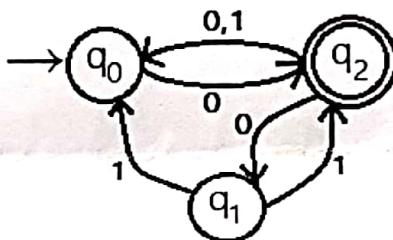
Obtained Marks:

Name:

Roll Number:

Section:

Q No.	Description	CLO	Marks																
1	a) Write down the phases of single pass compiler. b) What does mean by multi-pass compiler and what are its advantages.	1	4																
2	Convert the given NFA to DFA by using subset construction method. Show the complete process. $\Sigma = \{a, b\}$.	1	4																
3	<p>The lexical specification for TINY language is given below. Draw the transition diagram, transition table and tokenize the sample code <lexical unit, lexeme>.</p> <p>$\Sigma = \{a, b, c, \dots, z, 0, 1, +, =, ;, \text{newline}, \text{space}\}$</p> <table border="1"> <thead> <tr> <th>Lexical unit</th> <th>Pattern</th> <th>Sample code</th> </tr> </thead> <tbody> <tr> <td>Identifiers</td> <td>Three or more letters</td> <td rowspan="6">numa=100; var=11 +numb cout var;</td> </tr> <tr> <td>Keywords</td> <td>cout</td> </tr> <tr> <td>Numbers</td> <td>More than one digits</td> </tr> <tr> <td>Operators</td> <td>=, +</td> </tr> <tr> <td>Punctuations</td> <td>;</td> </tr> <tr> <td>Delimiter</td> <td>Space, newline</td> </tr> </tbody> </table>	Lexical unit	Pattern	Sample code	Identifiers	Three or more letters	numa=100; var=11 +numb cout var;	Keywords	cout	Numbers	More than one digits	Operators	=, +	Punctuations	;	Delimiter	Space, newline	1	5
Lexical unit	Pattern	Sample code																	
Identifiers	Three or more letters	numa=100; var=11 +numb cout var;																	
Keywords	cout																		
Numbers	More than one digits																		
Operators	=, +																		
Punctuations	;																		
Delimiter	Space, newline																		



4	Remove the ambiguity from the given grammar.	3	4
	$S \rightarrow aAd \mid aB$ $\underline{\underline{C}} \quad \underline{\underline{A}}$ $A \rightarrow Ac \mid Aad \mid d$ $B \rightarrow BA \mid a$ $\underline{\underline{C}} \quad \underline{\underline{B}}$		
5	Consider the following context free grammar $\text{Start} \rightarrow \text{Val}$ $\text{Val} \rightarrow \text{num} \mid (\text{Expr})$ $\text{Expr} \rightarrow + \text{Val Val} \mid * \text{Values}$ $\text{Values} \rightarrow \text{Val Values} \mid \lambda$ a) Compute the First and Follow Set. b) Construct the LL(1) parse table. c) Parse the input “* (+ num num)” by using LL(1) parse table.	3	8



Department of Computer Science, New Campus
**UNIVERSITY OF ENGINEERING
AND TECHNOLOGY, LAHORE**



Paper: Final Term

Semester: Fall 2021

Time Allowed: 120 Minutes

Total Marks: 40

Subject: CS-381 Software Engineering

Section: A & B

Roll #: 2079-CS-604

Name: Ammar Yasil

Instructions: Please read me carefully

- All questions are compulsory.
- Be Specific to the question.
- Return the Question Paper with the answer sheet.

Sr. No.	QUESTIONS	MARKS	(CLOs)
I	To give an exam, an instructor first notifies the students of the exam date and the material to be covered. He then prepares the exam paper (with sample solutions), gets it copied to produce enough copies for the class, and hands it out to students at the designated time and location. The students write their answers to exam questions and hand in their papers to the instructor. The instructor then gives the exam papers to the TAs and sample solutions to each question and gets them to mark them. He then records all marks and returns the papers to the students. Draw a <u>sequence diagram</u> that represents this process. Make sure to show when each actor is participating in the process. Also, show the operation that is carried out during each interaction and what its arguments are.	8	(CLO2)
II	Consider the world of libraries. A <u>library</u> has <u>books</u> , <u>videos</u> , and <u>CDs</u> that it loans to its users. All library material has an <u>id#</u> and a <u>title</u> . In addition, books have one or more <u>authors</u> , videos have one <u>producer</u> and one or more <u>actors</u> , while CDs have one or more <u>entertainers</u> . The library maintains one or more copies of each library item (book, video, or CD). <u>Copies</u> of all library material can be loaned to users. Reference-only material is loaned for <u>2hrs</u> and can't be removed from the library. Other material can be loaned for two weeks. The library <u>records</u> the user, the loan date and time, and the return date and time for every loan. The library maintains its name, address, and phone number for users. Draw a <u>class diagram</u> for the above-shared description.	8	(CLO2)
III	The Pizza Ordering System allows the user of a web browser to order pizza for home delivery. To place an order, a shopper	4+4	(CLO2)

	searches to find items to purchase adds items one at a time to a shopping cart and possibly searches again for more items. When all items have been chosen, the shopper provides a delivery address. If not paying with cash, the shopper also provides credit card information. The system has an option for shoppers to register with the pizza shop. They can then save their name and address information so that they do not have to enter this information every time that they place an order. Draw a <u>use case</u> and <u>activity diagram</u> for Pizza Ordering System.		
IV✓	Discuss the types of functional and non-functional testing in detail.	8+8	(CLO3)

😊 Wish you all the best 😊

$$f(x) = -x^3 + x^2 - x - 100$$
$$f'(x) = -3x^2 + 2x - 1$$

MID TERM EXAMINATION

Class: B.Sc Computer Science

Semester: 6th

Course Title: Numerical Methods

Time: 60 minutes

Reg NO: 2019-CS-604

Maximum Marks: 30

Note: Attempt all questions.

(a): Calculate one real root of $-x^3 + x^2 - x - 100 = 0$, using Newton Raphson method with initial approximation $x_0 = -4.2$, continue iteration process, till the absolute error between two consecutive iterations is correct to 4 decimal places, also write relation of convergence rate of Newton Raphson method with Bisection method. [CLO1] (12+13)

(b): Solve the following system by Gauss Seidal iterative method, correct to 4 decimal places

$$8x - 3y + 2z = 20$$

$$4x + 11y - z = 33$$

$$6x + 3y + 12z = 35$$

Q2: Drive relation $\mu^2 = 1 + \frac{\delta^2}{4}$, here ' μ ' represents average operator and ' δ ' represents central difference operator. [CLO2] (5)

Final-Term Exam : Database Systems (CS-363)

Total Pts: 40

Term: Spring 2021

Date: August 04, 2021

Duration: 2 Hours

Student Name: M. Ammar Yasir

Student ID: 2019-CS-604

Question No 1: (10 pts)

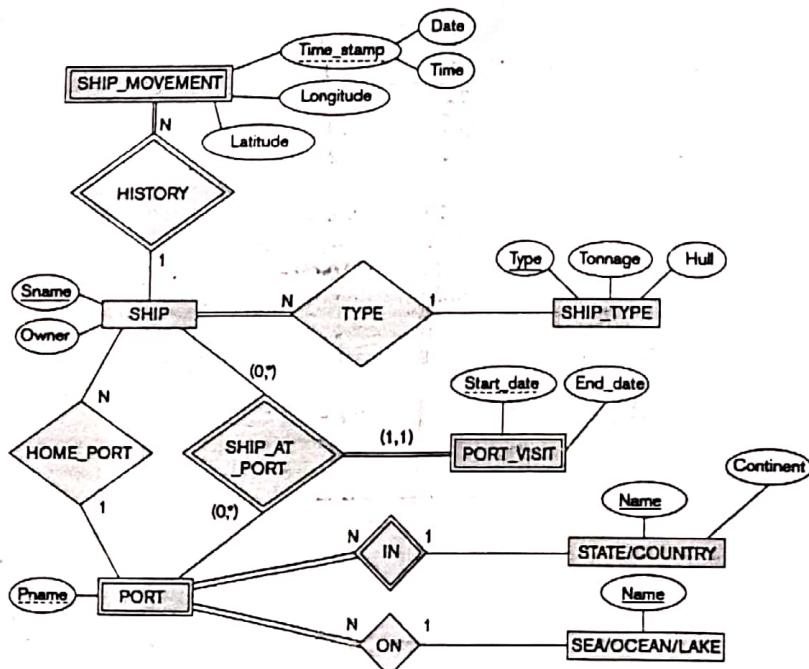
- (a) Design an enhanced entity-relationship diagram for the grade book database described below

GRADE_BOOK database help instructors record points earned by individual students in their classes.

The data requirements are summarized as follows:

- Each student is identified by a unique identifier, first and last name, and an e-mail address.
- Each instructor teaches certain courses each term. Each course is identified by a course number, a section number, and the term in which it is taught. For each course he or she teaches, the instructor specifies the minimum number of points required in order to earn letter grades A, B, C, D, and F. For example, 90 points for an A, 80 points for a B, 70 points for a C, and so forth.
- Students are enrolled in each course taught by the instructor.
- Each course has a number of grading components (such as midterm exam, final exam, project, and so forth). Each grading component has a maximum number of points (such as 100 or 50) and a weight (such as 20% or 10%). The weights of all the grading components of a course usually total 100.
- Finally, the instructor records the points earned by each student in each of the grading components in each of the courses. For example, student 1234 earns 84 points for the midterm exam grading component of the section 2 course CSc2310 in the fall term of 2009. The midterm exam grading component may have been defined to have a maximum of 100 points and a weight of 20% of the course grade.

- (b) The below figure shows an ER schema for a database that can be used to keep track of transport ships and their locations for maritime authorities. Map this schema into a relational schema(table structure) and specify all primary keys and foreign keys.



Question No 2: (10 pts)

(a) Consider the following relation:

CAR_SALE(Car#, Date_sold, Salesperson#, Commission%, Discount_amt).

Assume that a car may be sold by multiple salespeople, and hence {Car#, Salesperson#} is the primary key. Additional dependencies are

Date_sold → Discount_amt and Salesperson# → Commission%

Based on the given primary key, is this relation in 1NF, 2NF, or 3NF? Why or why not? How would you successively normalize it completely?

(b) Consider the following relation:

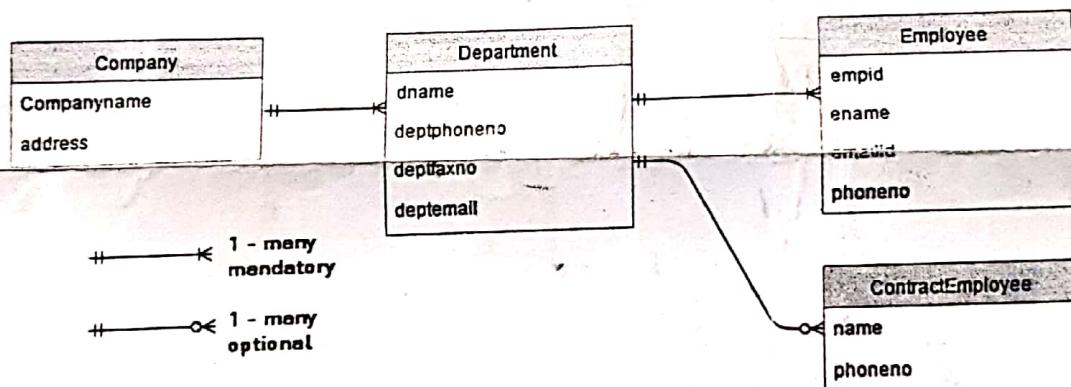
R (Doctor#, Patient#, Date, Diagnosis, Treat_code, Charge)

In the above relation, a tuple describes a visit of a patient to a doctor along with a treatment code and daily charge. Assume that diagnosis is determined (uniquely) for each patient by a doctor. Assume that each treatment code has a fixed charge (regardless of patient).

- Discuss which functional dependencies exist in this table.
- Is this relation in 3NF? Justify your answer and decompose if necessary.

Question No 3: (10 pts)

(a) Generate XML from the below diagram



(b) List down similarities and differences between XML and JSON.

Question No 4: (10 pts)

(a) Create a trigger that will cause an error when an update occurs that would result in a salary increase greater than ten percent of the current salary.

(b) What benefits NoSQL databases provide over relational databases.



Department of Computer Science (New Campus)
University of Engineering & Technology, Lahore

Subject: Machine Learning
(7th Semester, 2018 Session)

Student's Name: _____

Mid Term

Reg. Number: _____

Total Marks: 30
Time Allowed: 75 Minutes

CLO-1	<p>Question # 1</p> <p>a) Define Machine Learning in terms of experience E, task T and performance measure P. How would you differentiate traditional programming from Machine Learning? b) Identify <u>at least three</u> applications of Machine Learning in practice and briefly describe each of them.</p>	5 + 5 marks															
CLO-2	<p>Question # 2</p> <p>Interpret whether the star should belong to the circles or rectangles by applying Bayes Theorem. Provide all the calculations. (See Figure 1).</p> <p style="text-align: center;">(Figure 1)</p>	10 marks															
CLO-3	<p>Question # 3</p> <p>Calculate the values of weights, learning rate and the threshold value of the Sigmoid activation function when you implement the following function in a Single Layer Perceptron. Perform all the steps to achieve the output Y for all the combinations of inputs X_1 and X_2 as given in the table below.</p> <table border="1" style="margin-left: auto; margin-right: auto;"><thead><tr><th>X_1</th><th>X_2</th><th>Y</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr></tbody></table>	X_1	X_2	Y	0	0	0	0	1	1	1	0	1	1	1	1	10 marks
X_1	X_2	Y															
0	0	0															
0	1	1															
1	0	1															
1	1	1															



Department of Computer Science, New Campus
**UNIVERSITY OF ENGINEERING
AND TECHNOLOGY, LAHORE**



Paper: MID Term

Time Allowed: 90 Minutes

Subject: CS-441 Mobile Application Development

Instructor: Usman Ahmed Raza

Roll #: 2019-CS-604

Semester: Fall 2021

Total Marks: 30

Section: A, B

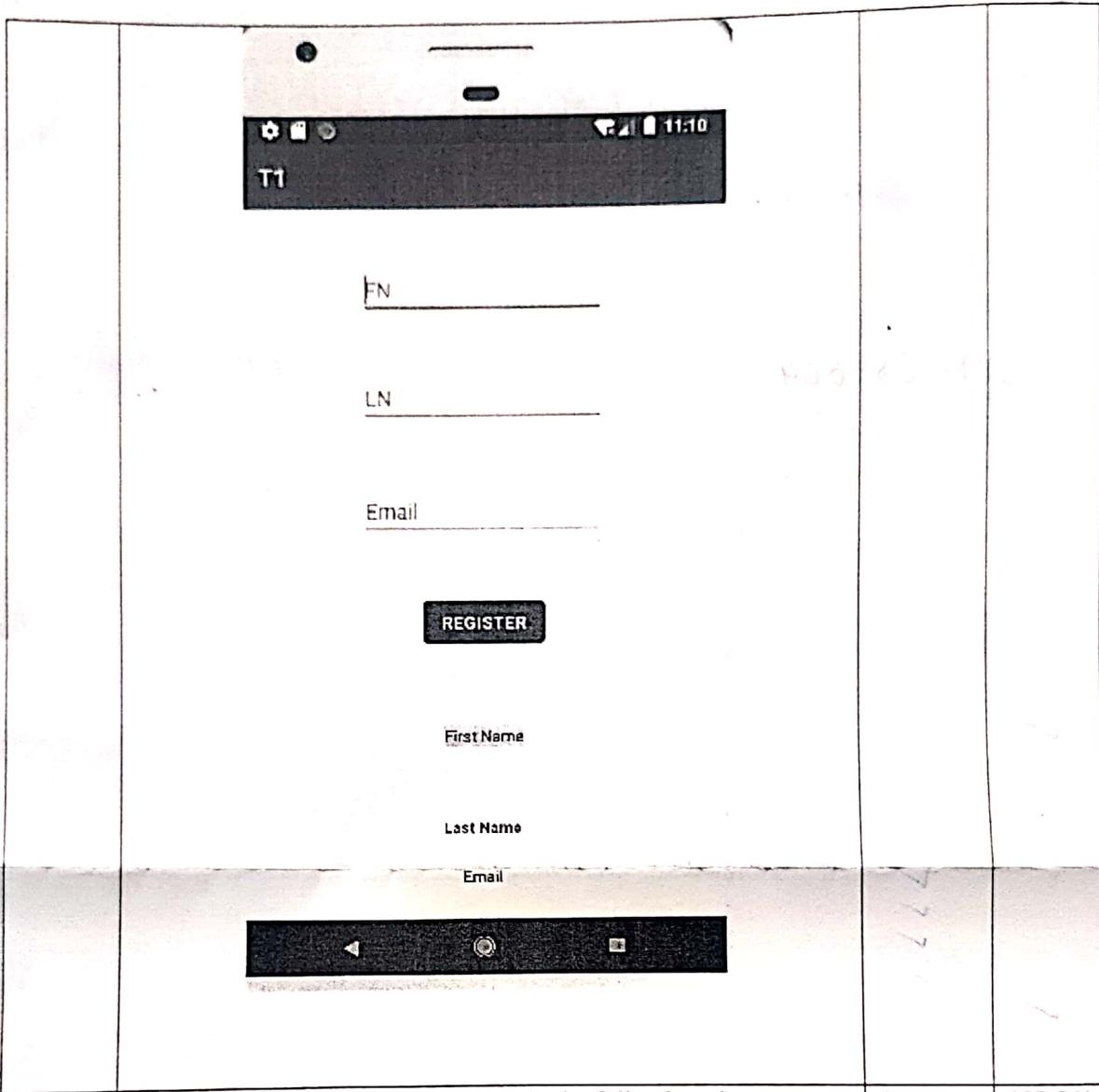
Date: 10-03-2022

Name: Ammar Yousaf

Instructions: Please read me carefully

- All questions are compulsory.
- Be Specific to the question.
- Return the Question Paper with the answer sheet.

Sr. No.	QUESTIONS	MARKS	(CLOs)
I ✓	The android architecture contains a different number of components to support any android device needs. Discuss the main components of architecture with a diagram.	6	(CLO1)
II ✓	Discuss the following terms: •✓Ubiquitous Computing •✓Mobile Computing •✓Examples of the Position sensor ✓Examples of Environmental sensor	4	(CLO1)
III ✓	Each day, thousands of mobile apps are published to the Google Play and Apple App Stores. Some of these mobile apps are games, others are social networks, and many are e-commerce apps. All of these apps, if professionally built, should follow a mobile app development process. Each app is different, and our methodologies are always evolving, but there is a fairly standard process when developing mobile apps. Kindly discuss the standard process from ideas generation to launch.	10	(CLO1)
IV	Explain the below-given figure and make an interactive app with 2 buttons, 2 edit text, and 2 text views, and write a java method to access the functionality.	6	(CLO2)



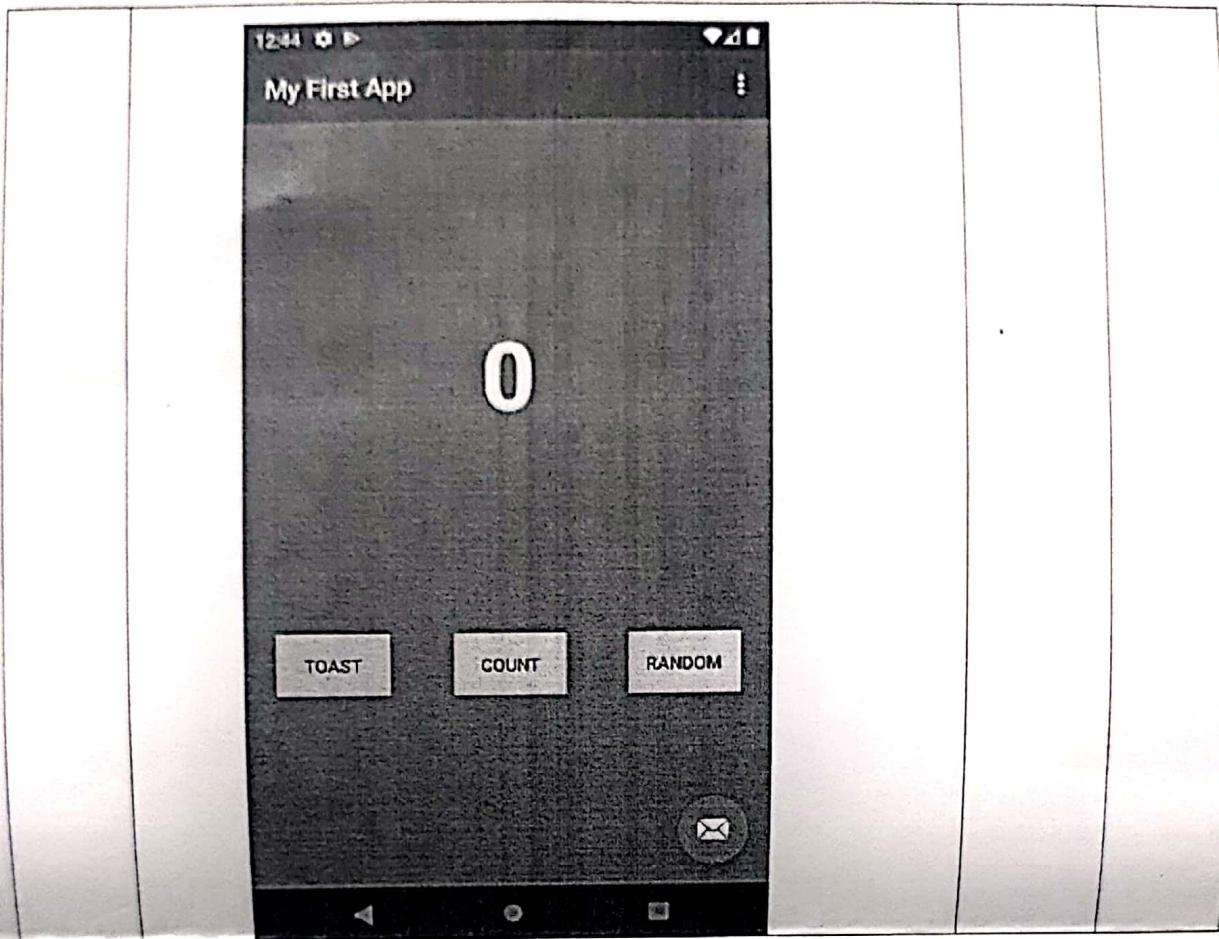
V	Find the below-given figure and apply the following changes: <ul style="list-style-type: none"> Change the name of buttons to "Ok", "Good", "Best" respectively Color of the button to Red The background color of the layout to yellow Show the toast Message "15" 	4	(CLO2)
---	--	---	--------

@Override

Public Void OnClick (View View)

```

{ Toast toast = Toast.makeText
  (getActivity) = "15", toast.LENGTH_SHORT;
  toast.show();
}
  
```



☺ Wish you all the best ☺

FINAL TERM EXAMINATION

Class: B.Sc Computer Science

Semester: 6th

Course Title: Numerical Methods

Time: 90 minutes

Reg NO: 2019-CS-604

Maximum Marks: 40

Note: Attempt all questions.

1(a): Given data

[CLO2] (12+13)

t (sec)	2	5	8	11
A (grams)	94.8	87.9	81.3	75.1

Construct a polynomial by Newton backward difference interpolation that satisfies given data.

1(b): Data is given in the following table; solve the integral $\int_0^{10} f(x) dx$, using the appropriate Simpson rule. *Simpson 1/3 rule.*

x	0	2.5	5.0	7.5	10
f(x)	0	18.25	75.0	168.75	300

Q2: Solve initial value problem $\frac{dy}{dx} = x + y$, $y(0) = 1$, $h = 0.1$, using RK-4, calculate $y(0.2)$, the exact solution of the problem is $y(x) = 2e^x - x - 1$, compute the absolute error between RK-4 and the exact solution and further sketch their graphs with proper legend. [CLO3] (15)

7 decimal places



Department of Computer Science, New Campus
**UNIVERSITY OF ENGINEERING
AND TECHNOLOGY, LAHORE**



Paper: Final Term

Semester: Spring 2022

Time Allowed: 120 minutes

Total Marks: 40

Subject: CS-441 Mobile Application Development

Section: A, B

Instructor: Usman Ahmed Raza

Weightage: 75%

Roll #: 2019-CS-604

Name: Ammal Yasir

Instructions: Please read me carefully

- All questions are compulsory.
- Be Specific to the question.
- Return the Question Paper with the answer sheet.

Sr. No.	QUESTIONS	MARKS	(CLOs)
I	Discuss the following terms: <ul style="list-style-type: none">• Web View• Constraints layout• Relative layout• Container• Splash Screen	10	(CLO2)
II	What is google firebase and why should you use it? ✓	5	(CLO3)
III	The demand for a <u>cross-platform</u> app development framework has reached a new height. The prime reason behind this increased demand is that cross-platform apps have a wider reach as compared to native apps because of which they allow businesses to reach a wide number of people making it a 'one-of-a-kind technology'. One of your friends Altaf needs your suggestion about the best cross-platform so that he can develop an application to raise funds for cholistan. Recommend two best cross-platforms with reasons and which deployment model of cloud will be suitable for him and why? Take any necessary assumptions, if required.	10	(CLO3)
IV	Explain the below-given code functionality a) <pre>LatLng sydney = new LatLng(-33.8644107035632, -74.24800617241); mMap.addMarker(new MarkerOptions().position(sydney).title("Marker in BET XIX")); mMap.moveCamera(CameraUpdateFactory.newLatLng(sydney));</pre> b)	5	(CLO2)

	<pre> public boolean onOptionsItemSelected(MenuItem item) { switch (item.getItemId()) { case R.id.normal_map: mMap.setMapType(GoogleMap.MAP_TYPE_NORMAL); return true; case R.id.hybrid_map: mMap.setMapType(GoogleMap.MAP_TYPE_HYBRID); return true; case R.id.satellite_map: mMap.setMapType(GoogleMap.MAP_TYPE_SATELLITE); return true; case R.id.terrain_map: mMap.setMapType(GoogleMap.MAP_TYPE_TERRAIN); return true; default: return super.onOptionsItemSelected(item); } } </pre>		
V a)	<p>Write the XML part of the below-given figures</p>	8+2	(CLO2)
b)	<p>What will be the output of the following program? Give an answer with a reason.</p> <pre> public class MyFirst { public static void main(String[] args) { MyFirst obj = new MyFirst(n); } } </pre>		

```
}

static int a = 10;
static int n;
int b = 5;
int c;
public MyFirst(int m) {
    System.out.println(a + ", " + b + ", " + c + ", " + n + ", "
    " + m);
}
// Instance Block
{
    b = 30;
    n = 20;
}
// Static Block
static
{
    a = 60;
}
```

😊 Wish you all the best 😊



Department of Computer Science (New Campus)
University of Engineering & Technology, Lahore

Subject: Introduction to Data Science
(6th Semester, 2019 Session)

Student's Name: Amna Yasir

Final Term

Total Marks: 40

Time Allowed: 120 Minutes

Reg. Number: 2019-CS-604

CLO-3 Question # 1

The data of a student shows that his mood is highly influenced by three factors: the **Weather** (**W**), his **Result** (**R**) and whether he has his favorite **Food** (**F**) to eat or not. The table below shows this data

Weather (W)	Result (R)	Food (F)	Mood (M)
Bad	Fail	Yes	Angry
Good	Fail	No	Angry
Good	Fail	No	Angry
Good	Fail	No	Angry
Bad	Pass	Yes	Angry
Bad	Pass	Yes	Happy
Bad	Pass	Yes	Happy
Good	Pass	No	Happy

5 + 5
Marks

a) On a new day when **W** = Good, **R** = Pass, and **F** = Yes, how would you predict his mood using Naïve Bayes classifier? Show all the calculations.

b) On another day when **W** = Bad, **R** = Fail, and **F** = No, how would you predict his mood using Naïve Bayes classifier? Show all the calculations.

CLO-3 Question # 2

a) The output of a machine learning classifier is given below in the form of actual and predicted data. Draw the Confusion Matrix of this classifier and calculate its accuracy.

Actual	Dog	Dog	Cat	Dog	Cat	Cat	Cat	Dog	Dog	Cat
Predicted	Cat	Dog	Cat	Dog	Dog	Cat	Cat	Dog	Cat	Cat

5 + 5
Marks

b) The output of a machine learning classifier is given below in the form of actual and predicted data. Draw the Confusion Matrix of this classifier and calculate the precision for each class.

Actual	Cat	Cat	Cat	Cat	Dog	Dog	Dog	Bird	Bird	Bird
Predicted	Cat	Cat	Cat	Cat	Dog	Dog	Cat	Dog	Bird	Cat

$$\frac{TP}{TP+FP}$$

CLO-3

Question # 3

- A random sample of 400 people were surveyed, and each person was asked to report the highest education level s/he has obtained. The data that resulted from the survey is summarized in the table below:

	Matriculation	Bachelors	Masters	Ph. D.	Total
Female	60	54	48	42	204
Male	40	45	54	57	196
Total	100	99	102	99	400

The NULL hypothesis states that the education level and gender are independent.
Apply Chi-Square test to accept or reject this NULL hypothesis.

Note: The critical value of Chi-Square with 3 degree of freedom at 5% level of significance is **7.815**

- b) Given the three documents below, calculate the cosine similarity between them to find which two documents are more similar?

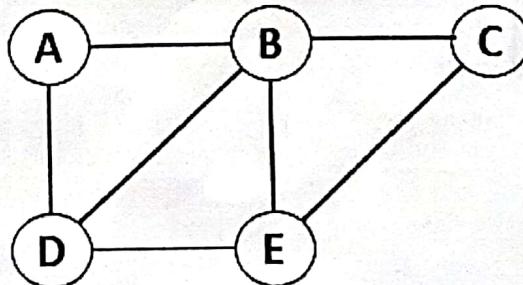
D1	We ate pizza at home.
D2	We ate pizza at cafeteria.
D3	We ate pizza together.

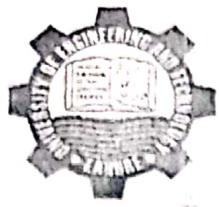
LO-2

Question # 4

- a) Describe different centrality measures used in social network analysis to find the importance of a node in a graph.

- b) Find the average clustering coefficient of the graph in Figure 1.

**Figure 1**5+5
Marks



Subject: Introduction to Data Science
(6th Semester, 2019 Session, Sec-A)

Student's Name: Ammar Yasir

QUIZ # 1

Total Marks: 10

Time Allowed: 20 Minutes

Reg. Number: 2019-CS-604

CLO-1	Question # 1	Marks																						
	<p>A store manager believes that there is a linear relationship between the income from sales of goods (Y) and the amount spent on advertising (X), both in thousands of dollars.</p> <table border="1"> <thead> <tr> <th>Advertising spending</th> <th>Income from sales</th> </tr> </thead> <tbody> <tr><td>5.3</td><td>21</td></tr> <tr><td>3.8</td><td>16</td></tr> <tr><td>3.1</td><td>13</td></tr> <tr><td>2.9</td><td>12</td></tr> <tr><td>4.4</td><td>23</td></tr> <tr><td>4.9</td><td>20</td></tr> <tr><td>5.1</td><td>23</td></tr> <tr><td>5.4</td><td>24</td></tr> <tr><td>3.2</td><td>14</td></tr> <tr><td>5.1</td><td>19</td></tr> </tbody> </table> <p>Please note:</p> $\begin{array}{r rrr} X & Y & Y - \bar{Y} & Y - \bar{Y} \\ \hline 22.5 & 1.5 & 2.5 & 2.5 \\ 16.8 & -0.4 & -2.5 & -2.5 \\ 13.5 & -0.5 & -5.5 & -5.5 \\ 12.67 & -0.7 & -6.5 & -6.5 \\ 18.8 & 1.2 & 4.5 & 4.5 \\ 20.89 & 0.9 & 1.5 & 1.5 \\ 21.7 & 1.3 & 4.5 & 4.5 \\ 22.9 & 0.1 & 5.5 & 5.5 \\ 13.9 & -2.7 & -4.5 & -4.5 \\ 21.7 & 0.7 & 0.5 & 0.5 \\ \hline \sum(Y - \bar{Y}) & 0 & 2 & 2 \\ \hline n & 0 & 3 & 3 \end{array}$ <p>Given the equation of Linear Regression is $\hat{y}_i = b_0 + b_1 x_i$</p> <p>a) Calculate the linear regression coefficients b_0 and b_1 for this data. b) Comment on the 'goodness-of-fit' of the regression line. c) Estimate the income from sales if an amount of 4.5 (in thousand dollars) is spent. d) Calculate the Root Mean Square Error for this data.</p>	Advertising spending	Income from sales	5.3	21	3.8	16	3.1	13	2.9	12	4.4	23	4.9	20	5.1	23	5.4	24	3.2	14	5.1	19	
Advertising spending	Income from sales																							
5.3	21																							
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4.4	23																							
4.9	20																							
5.1	23																							
5.4	24																							
3.2	14																							
5.1	19																							

(a)

$$b_0 = \frac{\sum y - b_1 \sum x}{n}$$

$$= \frac{185 - (4.107)(43.2)}{10}$$

$$= \frac{185 - 177.44}{10}$$

$$= \frac{7.561}{10} \Rightarrow 0.7561$$

$$b_1 = \frac{n \sum (xy) - (\sum x)(\sum y)}{n \sum x^2 - (\sum x)^2}$$

$$= \frac{10(835) - (43.2)(185)}{(10)(195.34) - (43.2)^2}$$

$$= \frac{8350 - 7992}{1953.4 - 1866.24}$$

$$= \frac{358}{87.16} \Rightarrow 4.107$$

Goodness-of-fit:

(b)

It means that the actual point values are closer to the experimented or predicted point values i.e. the regression line will be its goodness-of-fit. More the points near to regression line more