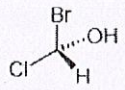
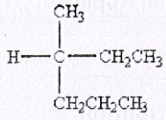
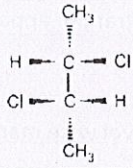
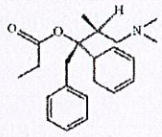
Exam Feb 2023

Exam Code-1221

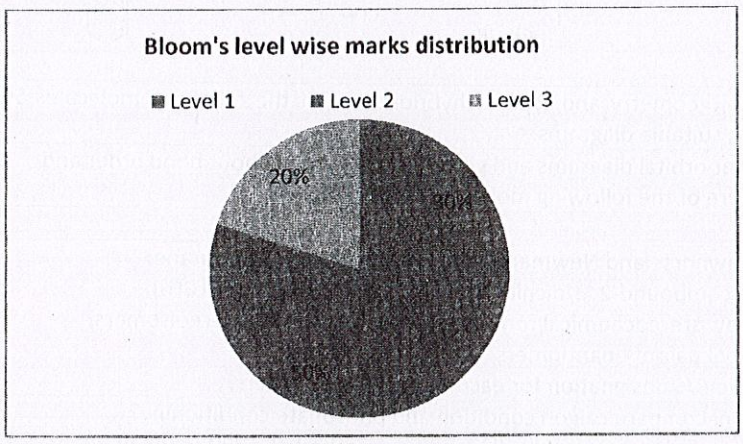
Subject Code- CH10516 (CHEMISTRY)

Time: 3 hrs. MM: 70

S. No		Questions	Marks	CO	BL	PI
Q1	(a)	Write any four principles of green chemistry.	2	5	1	7.1.2
	(b)	Assign absolute configuration to the chiral carbon present in the following molecules a  b  c  d 	2	1	2,3	1.2.1
	(c)	Identify shape, geometry and type of hybridisation of the following molecules SF_4, SO_3, PO_4^{2-} with suitable diagrams.	3	1	1,3	1.2.1
	(d)	Draw molecular orbital diagrams and give the information about bond order and magnetic nature of the following molecule: N_2, NO, F_2, HCl.	7	1	1,3	1.2.1
		OR				
	(e)	I. Draw Sawhorse and Newman projections of ethane and butane. II. For the compound-2, 3-dichloropentane ($CH_3CH_2CHCLCHCLCH_3$), a) Draw stereochemical formulas for all the possible stereoisomers, b) Label pair of enantiomers, c) Give R/S designation for each of the stereoisomers.	4+3	1	2,3	1.2.1
Q2	(a)	Giving reaction, compare calgon condition and phosphate conditioning?	2	2	2	1.2.1
	(b)	Presenting chemical reaction, describe any one method of disinfection of water.	2	2	1	1.2.1
	(c)	Draw the chemical structure of the following: I. Metal-EDTA complex II. Eriochrome black –T (EBT) indicator III. Methyl orange Indicator	3	2	1	1.2.1
	(d)	A water sample contains the following salts: $Ca(HCO_3)_2$ = 203 mg/L, $Mg(HCO_3)_2$ = 95 mg/L, $CaSO_4$ = 136 mg/L, $MgCl_2$ = 95 mg/L, $CaCl_2$ = 111 mg/L, KCl = 100 mg/L Calculate the temporary and permanent hardness of water in ppm.	7	2	2,3	1.2.1
		OR				
	(e)	Describe Lime-Soda method of softening of water under following head: (i) Principle (ii) Chemical reactions (iii) Labelled diagram (iv) Advantages	7	2	2	1.2.1
Q3	(a)	Write definition and significance of Drop Point of semi solid lubricants.	2	3	1	1.2.1
	(b)	Giving example, explain principle involved in bimetallic corrosion.	2	3	2	1.2.1
	(c)	Illustrating various examples, write an informative note on Solid Lubricants	3	3	1	1.2.1
	(d)	I. Enlisting various types, write the functions of Greases. II. A lubricating oil of unknown viscosity-index has the Saybolt Universal Viscosity of 60 seconds at 210°F and of 400 seconds at 100°F. The standard pennysylvanian oil has Saybolt Universal Viscosity of 60 seconds at 210°F and 300 seconds at 100°F. The standard gulf oil has a Saybolt Universal Viscosity of 60 seconds at 210°F and 800 seconds at 100°F. Calculate the viscosity-index of oil.	4+3	3	2,3	1.2.1
		OR				
	(e)	Explain, How the nature of metal and environment influencing rate of corrosion?	7	3	2	1.2.1
Q4	(a)	Giving example of each, discuss the classification of nano materials.	2	3	1	1.2.1
	(b)	Giving example of each, define Thermoplastics and Thermosettings.	2	3	1	1.2.1
	(c)	Differentiate between Addition and condensation polymerization.	3	3	2	1.2.1
	(d)	What are Smart Materials? Giving principle of each discuss applications of any five smart materials.	7	3	2	1.2.1
		OR				
	(e)	Taking suitable example, explain how the Cationic and Anionic mechanism of polymerization carried out.	7	3	2	1.2.1

P.T.O

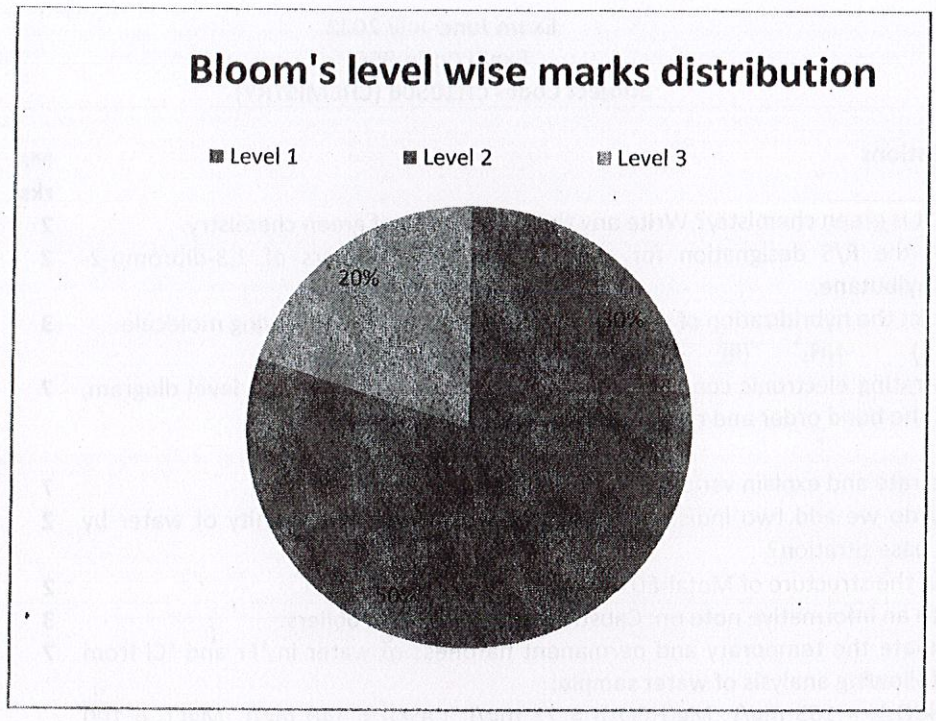
Q5	(a)	Draw and define: Electromagnetic Spectrum.	2	4	2	1.2.1
	(b)	Discuss various absorption and intensity shifts observed in UV-visible spectrum.	2	4	2	1.2.1
	(c)	Predict the no. of fundamental vibrational modes in the following molecules: (i) CO_2 (ii) H_2S (iii) C_2H_2	3	4	2	1.2.1
	(d)	Write the principle of IR spectroscopy and describe various molecular vibrations involved in the technique.	7	4	3	1.2.1
		OR				
	(e)	Discuss Gas-Liquid Chromatography under following heads: (i) Principle involved (ii) Schematic diagram of apparatus (iii) Applications	7	4	2	1.2.1



Exam June-July 2022
Exam Code-956
Subject Code- CH10506 (CHEMISTRY)

Time: 3 hrs. **MM: 70**

S. No		Questions	Marks	CO	BL	PI
Q1	(a)	What is green chemistry? Write any three principles of green chemistry.	2	1	1	7.1.2
	(b)	Give the R/S designation for each of the stereoisomers of 1,3-dibromo-2-methylbutane.	2	1	2,3	1.1.1
	(c)	Predict the hybridization of central atom and shape of the following molecule: (i) NH_4^+ (ii) H_2O (iii) $SnCl_2$	3	1	1,3	1.2.1
	(d)	Illustrating electronic configuration and molecular orbital energy level diagram, find the bond order and magnetic behaviour of NO.	7	1	1,3	1.2.1
		OR				
	(e)	Illustrate and explain various conformational isomers of *n*-butane.	7	1	2,3	1.2.1
Q2	(a)	Why do we add two indicators during determination of alkalinity of water by acid base titration?	2	1,2	2	1.2.1
	(b)	Draw the structure of Metal-EDTA complex and Indicator EBT.	2	1,2	1	1.2.1
	(c)	Write an informative note on: Caustic Embrittlement in boilers.	3	1,2	1	1.2.1
	(d)	Calculate the temporary and permanent hardness of water in °Fr and °Cl from the following analysis of water sample: $Ca(HCO_3)_2$ = 165 mg/L, $Mg(HCO_3)_2$ = 73 mg/L, $CaSO_4$ = 140 mg/L, $MgCl_2$ = 100 mg/L, $MgSO_4$ = 50 mg/L, $CaCl_2$ = 139 mg/L, KCl = 100 mg/L	7	2	2,3	1.1.1
		OR				
	(e)	Describe ion exchange method of softening of water under following head: (i) Principle involved (ii) structure of resins and chemical reactions (iii) labelled diagram (iv) Advantages and disadvantages.	7	1,2	2	1.2.1
Q3	(a)	Giving significance, define Flash point of an oil.	2	3	1	1.2.1
	(b)	Write an informative note on waterline corrosion.	2	1,3	1	1.2.1
	(c)	Give reason why Steel bolts should not be used in Copper equipments?	3	1,3	2	1.2.1
	(d)	I. Explain, types and significance of Cutting fluids. II. A lubricating oil of unknown viscosity-index has the Saybolt Universal Viscosity of 60 seconds at 210°F and of 60 seconds at 100°F. The standard pennysylvanian oil has Saybolt Universal Viscosity of 60 seconds at 210°F and 500 seconds at 100°F. The standard gulf oil has a Saybolt Universal Viscosity of 60 seconds at 210°F and 800 seconds at 100°F. Calculate the viscosity-index of oil.	3+4	1,3	2,3	1.1.1
		OR				
	(e)	Taking suitable example, explain electrochemical theory of wet corrosion in detail.	7	1,3	2	1.2.1
Q4	(a)	Giving chemical structure of Polyester, discuss its uses.	2	1,3	1	1.2.1
	(b)	Giving function of each, discuss any two types of smart material.	2	3	1	1.2.1
	(c)	Differentiate between Thermoplastics and Thermosettings.	3	1,3	2	1.2.1
	(d)	Enlisting various applications, discuss any two methods of synthesis of nano material.	7	1,3	2	1.2.1
		OR				
	(e)	Taking suitable example, explain Addition and condensation polymerization.	7	1,3	2	1.2.1
Q5	(a)	Find out the number of fundamental vibrations for C_6H_6, H_2S, C_2H_2 and N_2O.	2	1,4	2	1.1.1
	(b)	Discuss fundamental principles involved in chromatographic separation.	2	1,4	2	1.2.1
	(c)	Discuss various electronic transitions involved in UV-visible region.	3	1,4	2	1.2.1
	(d)	Calculate the approximate stretching frequency and wave no of C–H single bond. Force constant $=5.0\times10^5$ gm sec^{-2}	7	1,4	3	1.1.1
		OR				
	(e)	Discuss Atomic Absorption Spectroscopy under following heads: (i) Principle involved (ii) Schematic diagram of apparatus (iii) Applications	7	1,4	2	1.2.1


Bloom's level wise marks distribution
Level 1
Level 2
Level 3
20%
30%
50%

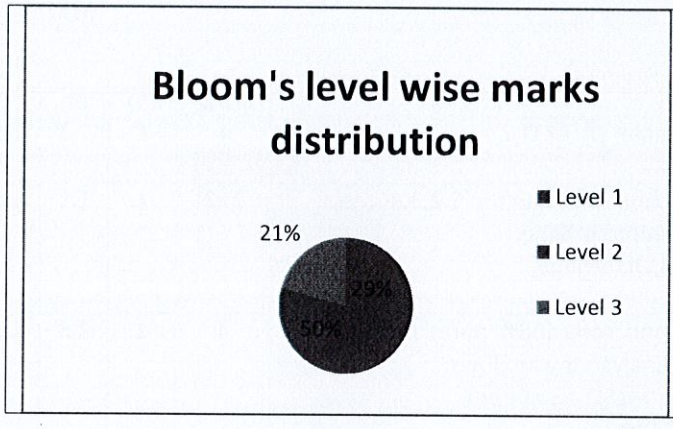
ONLINE FEB 2022 EXAMINATION
Exam Code-2236
Subject Code- CH10506 (CHEMISTRY)

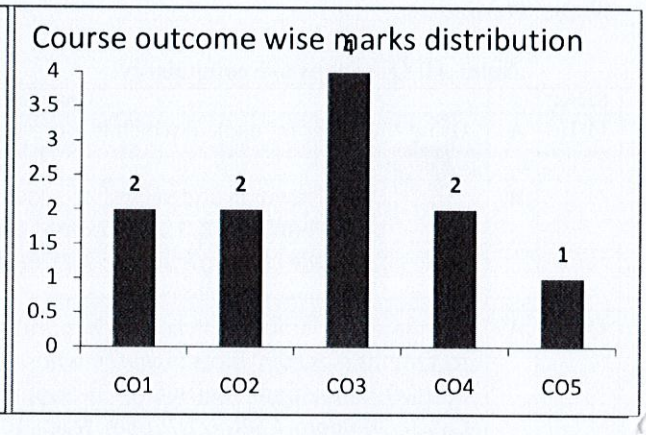
Time: 90 Minutes **MM: 40**

Note: All Questions are compulsory.

S. No.		Questions	Marks	CO	BL	PI
Q.1	A	Using MO diagram explain which is more stable: O_2^+ or O_2?	4	1	1,2	1.5.1
	B	i. Draw Newman and Sawhorse projection formulae for 1,2,3,4- tetra bromobutane **OR** 1,2- di bromo 1-chloro ethane. ii. Draw the structure of 2(E), 4(Z), 6(E)-Octatriene.	2+2	1	1,2	1.5.1
Q.2	A	Calculate the amount of lime(92% pure) and soda (98% pure) required for treatment of 30,000 litres of water, whose analysis is as follows: $Ca(HCO_3)_2$=40.5ppm, $Mg(HCO_3)_2$=36.55ppm, $MgSO_4$=30.0ppm, $CaSO_4$=34.0ppm, $CaCl_2$=27.75ppm, NaCl=10.0ppm	4	2	2,3	1.2.1
	B	Giving reaction of each, explain the function of the following in water treatment (a) Bleaching powder (b) Calgon (c) Sodium aluminate (d) Chloramine	4	2,5	1,2	1.5.1
Q.3	A	Explain, how Corrosion can be minimised by using the following techniques? (a) Using inhibitors (b) by design and material selection.	4	3	1	1.5.1
	B	Calculate the viscosity-index of oil when it has the Saybolt universal viscosity of 86 seconds at 210 ℉ and of 600 seconds at 100 ℉. The high viscosity-index standard Pennsylvanian oil has Saybolt universal viscosity of 86 seconds at 98.9 ℉ and 400 seconds at 100 ℉. The low viscosity-index standard gulf oil has a Saybolt universal viscosity of 86 seconds at 210 ℉ and 800 seconds at 100 ℉.	4	3	3,4	1.2.1
Q.4	A	Giving suitable examples of each, explain Addition and Condensation methods of polymerization.	4	3	1,2	1.5.1
	B	Explain the bottom up and top down approaches for syntheses of nanomaterials. Enlist advantages and disadvantages of each method.	4	3	2,3	1.5.1
Q.5	A	Enlist types of fundamental vibrations that a molecule exhibit. Find out the number of fundamental vibrations for Chloroform and Methanol.	2+2	4	1,2	1.2.1
	B	Draw the schematic diagram of a GLC apparatus. Discuss the principle of column chromatography and suggest how will you separate a compound from a given mixture?	2+2	4	1,4	1.5.1

Bllom's Taxonomy Chart





FEB-2023 EXAMINATION 1114

EC10508 /EC-1058 Basic Electronics

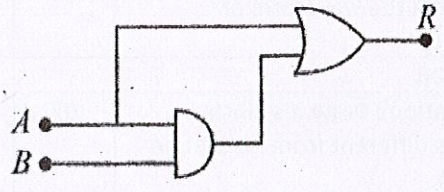
I B.E./B.TECH EXAMINATION

Time 3 hrs. Max Marks:70

Min Marks: 22

NOTE: Attempt all the questions. All carry equal marks.All abbreviations carry their usual meanings.

TOTAL QUESTIONS - 05

Q. No		Question	Marks	CO	BL	PI
1	a	Explain the formation of Depletion layer in a PN junction.	02	1	1	1.4.1
	b	Sketch the V – I characteristics of a P N junction Diode.	02	1	1	1.4.1
	c	How does Zener Diode regulate the voltage? Explain.	03	1	2	1.4.1
	d	What is the difference between Half wave and Full wave rectifier? Draw the circuit diagram of Bridge Rectifier with labelled input and output waveform.	07	1	2	1.4.1
		OR				
	e	Explain the working of NPN CE transistor amplifier. Also draw its input and output characteristics and indicate different regions of importance.	07	1	2	1.4.1
2	a	Explain the working of Depletion type MOSFET.	02	2	1	1.4.1
	b	Explain the Virtual Ground Concept in an Operational Amplifier.	02	2	2	1.4.1
	c	Bringout a pointwise comparison between JFET and MOSFET.	03	2	2	1.4.2
	d	Explain with the help of neat diagrams, the structure of an N channel FET and it's volt-ampere characteristics.	07	2	3	1.4.1
		OR				
	e	What are characteristics of an OP-Amp? Also draw circuit diagram of OP-Amp as an Adder and Integrator.	07	2	3	1.4.1
3	a	A combinational circuit of logic gate is shown in circuit below, if A is at 3V and B is at 0V, then what will be potential at R ? 	02	3	2	1.4.1
	b	State true or false for statements given below	02	3	1	1.4.1

		i. OR gate can be implemented using three NOR gates. ii. NAND gate give output 1, when any input is 1.				
	c	Solve the following i. Convert $(478.39)_{10}$ into octal ii. $(11000101101)_{Gray}$ into Binary iii. Prove (X+Y)(X+Z)= X+YZ	03	3	2	1.4.1
	d	What are combinational circuits? Describe, how a 3-bit adder can be implemented along with its circuit diagram and corresponding equations.	07	3	3	1.4.1
		OR				
	e	Simplify the expressions given below using K-map & implement the circuit diagrams for simplified expressions. i. F = A'B'C' + A'B'C + A'BC + AB'C + ABC' ii. F (A, B, C) = ∑m(0,1,5,6,7)	07	3	2	1.4.2
4	a	What is Flip Flop? Write its applications?	02	4	1	1.4.1
	b	State the "Invalid state" of RS flip-flop. Give reason, why is it generated?	02	4	2	1.4.1
	c	Draw the circuit diagram of 4-bit binary weighted resistor DAC for input data 1010 and find output voltage?	03	4	2	1.4.1
	d	Realize J-K flip-flop with circuit diagram & characteristics table. Deduce its characteristics equation. Illustrate working in detail.	07	4	3	1.4.1
		OR				
	e	What is the significance of ADC & DAC? Using appropriate diagram, explain any one type of analog to digital converter in detail.	07	4	3	1.4.1
5	a	Define Modulation. Why is it needed?	02	5	1	1.4.1
	b	How DSO is advantageous over CRO?	02	5	1	1.4.1
	c	Differentiate between Sensors and Transducers.	03	5	2	1.4.1
	d	Draw and explain block diagram of Communication System. Also sketch and label the waveform of Amplitude modulated wave.	07	5	3	1.4.1
		OR				
	e	What is Pulse Code Modulation? Draw it's block diagram and show how it is different from Amplitude and Frequency Modulation.	07	5	3	1.4.3

FEB 2023 EXAMINATION
I B.Tech. (4YDC) EXAMINATION
CO10504/ CO10507: PROGRAMMING FOR PRPBLEM SOLVING

Time: 3 Hrs.] **[Max. Marks: 70**

TOTAL NO. OF QUESTIONS IN THIS PAPER: 5

NOTE: 1) Answer to the point and make assumptions wherever required and clearly state them.
2) Attempt all parts of same question at one place and each question carries five sub parts a, b, c, d, e. Part a, b, c is compulsory and attempt any one from d and e.

Question No.			Question	Marks	CO	BT	PI
Q.1	(a)		Differentiate between: i) Source code file and executable code file ii) Keywords and Identifiers	02	CO1	BT1	1.7.1
	(b)		Identify the most appropriate answer of the following : i) _____command is used to rename a file in linux environment. ii) Computers use the _____ language to process data. iii) Scanner and Mouse are examples of ____ types of devices. iv) Internet Explorer is an example of _____ software. (System/Application)	02	CO1	BT1	1.7.1
	(c)		Answer the following: (i) How many bits are there in the following - byte, megabyte, and gigabyte? (ii) Enlist the name of Linux commands that are used for development of the program using C language.	03	CO1	BT2	1.7.1
	(d)	(i)	Draw a flowchart to check whether the given integer number is a prime number or not. In flowchart handle all cases of the number i.e. negative number, positive number and non-integer.	05	CO1	BT3	2.5.2
		(ii)	How run-time error is different from compile-time errors?	02	CO1	BT2	1.7.1
			OR				
	(e)	(i)	Draw a flowchart to calculate the sum of series. $Sin(x) = x - x^3/3! + x^5/5! - x^7/7! + \ldots$	05	CO1	BT3	2.5.2
		(ii)	What is a variable? Explain the ways to declare scope of a variable.	02	CO1	BT2	1.7.1
Q.2	(a)		Differentiate between type casting and type conversion with the help of an example.	02	CO2	BT2	1.7.1
	(b)		Identify the most appropriate answer of the following: i) _____ is the range of values that can be stored by int datatype in C. ii) ?: is a type of _____ operator. iii) _____ is the number of whitespace characters allowed in C language. iv) _____ case is matched in a switch statement, when all cases are unmatched.	02	CO2	BT2	1.7.1
	(c)		Write a program that prints a table with each line giving an integer, its square, and its cube. Ask the user to input the lower and upper limits for the table.	03	CO2	BT2	1.7.1

	(d)		Evaluate the expressions for the following, assume that the variables are declared and initialized as follows:
			int x = 3, y = 4, z = 5;
			float a = 2.5, b = 3.5, c = 4.5;
			i) (float)b * (y % x) * y / 2 || z * x ;
			ii) ++x / 4 * z++ + y / x++ *b;
			iii) y < c || x > a * ++x && z <=5 * b ;
				07	CO2	BT3	1.2.1

			OR				
	(e)		Write a program to find the difference of two dates in years, month, and days. Find whether the entered dates are valid or not. Assume that the first date falls before second date.	07	CO2	BT3	2.5.2
Q.3	(a)		What is an infinite loop? Write the syntax of infinite loop using for loop.	02	CO3	BT2	1.7.1

(b) Explain the output of the following C code with proper justification? 02 CO3 BT4 2.5.2

```
#include <stdio.h>
int main(){
  int i, j;
  for (i = 2; i < 10; i++) {
    for (j = 2; j <= 5; j++)
      if (!(i % j))
        break;
    if (j > (i / j))
      printf("%d ", i);  }
  return 0; }
```

(c) Write the following function in a recursive manner. 03 CO3 BT4 3.8.2

```
int function(int n)
{
  int sum=0;
  int count=1;
  while(count <=n) {
    sum = sum+ count;
    count+count+2; }
  return sum; }
```

(d) Two different numbers are called amicable numbers, if the sum of the proper divisors of each is equal to the other number. For example 220 and 284 are amicable numbers. 07 CO3 BT3 3.8.2

Sum of proper divisors of 220 = 1+2+4+5+10+11+20+22+44+55+110 = 284
Sum of proper divisors of 284 = 1+2+4+71+142 = 220
Write a function to print all amicable numbers in a given range.

OR

(e) Consider a sorted array X of n elements. Given a key to be searched, the array is partitioned into three halves at the elements mid1 and mid2. mid 1 indicates 1/3rd index and mid2 indicates 2/3rd index of the sorted array. Now comparing the key value to mid1 or mid2 is it determined whether the key lies in first third, middle third or last third of the array. Continue the process until the key is found, if it exists in the array. Write a recursive function TernarySearch(), which takes 4 arguments as input: array, lest index, right index, key to be searched. The program should return the value of the key and index, if it exists in the array, otherwise returns -1. 07 CO3 BT3 3.8.2

Q.4 (a) Explain the output of the following C code with proper justification? 02 CO4 BT4 2.5.2

```
#include <stdio.h>
int main(){
  int arr[5]= {1, 2, 3, 4, 5};
  int *ptr1= arr;
  int *ptr2= ptr1+3;
  int *ptr3= ptr2+3;
  printf("%d\n", *ptr2);
  printf("%ld\n", ptr2-ptr1);
  printf("%d\n", *(arr+4));
  return 0; }
```

(b) Differentiate between call by value and call by reference with the help of an example. 02 CO4 BT2 1.7.1

(c) Write a program using function reverse (), that takes a string as argument and reverses only a portion of the string using pointers. 03 CO4 BT3 4.5.1

(d) Consider a 1-D array of integers 0's and 1's. Write a program which reads the 0/1 array having n (<20) elements and then prints the length of the longest sequence of 1's. 07 CO4 BT3 4.5.1

Example , if the input array is int arr[15]= {0,1,0,1,1,0,0,1,1,1,1,0,1,0,1} the length of the longest run of 1's is 4.

OR

(e) A record of "n" employee using an array of structures with four fields (empId, ename, age, salary) is maintained. Each field is of an appropriate data type. 07 CO4 BT3 4.5.1

Write a program to store records of this structure in a file and sort them on the basis

of empId and name.

Q.5	(a)	Compare and contrast the structured programming and object oriented programming.	02	CO4	BT2	1.7.1
	(b)	Explain the visibility of base class members for the access specifiers: private, protected, and public.	02	CO4	BT2	1.7.1
	(c)	Differentiate between the following: (i) Function overloading and Operator overloading (ii) Abstraction and Encapsulation	03	CO4	BT2	1.7.1
	(d)	Create a class named Shape with a function that prints "This is a shape". Create another class named Polygon inheriting the Shape class with the same function that prints "Polygon is a shape". Create two other classes named Rectangle and Triangle having the same function which prints "Rectangle is a polygon" and "Triangle is a polygon" respectively.	07	CO4	BT3	4.5.1
		OR				
	(e)	Implement a class 'printdata' with two-member functions all with the same name 'print' **void print(int)** – outputs value – , that is, value followed by the value of the integer **void print (int, int)** – outputs value – [,], that is, value followed by the two integers separated by a comma in square brackets. Write a main function that uses the above class and its member functions.	07	CO4	BT3	4.5.1

XXXXX

2121

Online Feb. 2022 EXAMINATION
I B.E./ B.Tech (4YDC) EXAMINATION
CO 10504: COMPUTER PROGRAMMING

Time: 90 Mins.] **[Max. Marks: 40**

TOTAL NO. OF QUESTIONS IN THIS PAPER: 5

NOTE:
1) Answer to the point and make assumptions wherever required and clearly state them.
2) Attempt all parts of same question at one place and each question carries two sub parts a and b. Attempt any one from a and b.

Question No.			Question	Marks	CO	BL
Q.1	(a)	(i)	Solve the following: i) $(1834.342)_{11} = (?)_9$ ii) $(C3F.C4B)_{17} = (?)_5$ iii) $(647.123)_8 = (?)_2$	04	CO1	BL2
		(ii)	Draw a flowchart to print the sum of squares of all even numbers between 2 to 500 (both numbers inclusive).	04	CO1	BL2
			OR			
	(b)	(i)	Solve the following: i) $(686.3A2)_{16} = (?)_8$ ii) $(324.3124)_{11} = (?)_7$ iii) $(231.212)_5 = (?)_9$	04	CO1	BL3
		(ii)	Draw a flowchart to find if the given number is a palindromic prime number or not.	04	CO1	BL2
Q.2	(a)	(i)	Solve the following for the values int a = 10, b= -15, c =20,d= -6, Z=0; 1) Z= a < b || ++c * 2 % 2 + 1 && 2 + !b % 2; 2) Z= ++b * d > a % b * -1? a % 2 - 20 : c * 10 +5 ; 3) Z= a + 5 * c * d < a && b	04	CO1	BL5
		(ii)	An astrologist map large numbers to single digit number between 1 and 9 in order to tell your future. Suppose Ram went to an astrologist to find his future. Suppose he tell his date of birth as 19011987 and astrologist maps it to 9. Write a program, which takes a number as input and it reduces it to a single digit.	04	CO2	BL3
			OR			
	(b)	(i)	Write a program using switch to take a 4-digit integer as input and check if it is divisible by 2, 3, 4, and 12.	04	CO2, CO3	BL4
		(ii)	You are given a sequence of non-negative integers terminated by -1. You have to output 1 if there are atleast 2 distinct elements in the sequence and 0 if the sequence consists of only 1 integer. Note that -1 is not part of the sequence. The sequence is not necessarily sorted. Note: Don't use arrays to this question. Example: Input: 1 1 1 2 -1 Output: 1, Input: 4 4 4 4 4 -1 Output: 0	04	CO3	BL4

Q.3	(a)	(i)	Write a program to input two 1-D int type arrays A[10] and B[10] which contain positive integers and store the set difference A-B in C. Fill the remaining positions of C[10] with - 1. Assume that all the elements in A and B are distinct. For Example: Set difference A-B is the subset of A which have elements which are not in B. A={1,2,6,11,3}, B={2,7,9,10,11} then A-B={1,6,3}.	04	CO3	BL4
		(ii)	Write a program that takes two positive integers n1 and n2 from the user and check if they are permutation of each other.	04	CO4	BL5
			OR			

	(b)	(i)	The following program intends to compute π by Newton's formula upto the 10000-th term:
			$$\frac{\pi}{2} = \sum_{k=0}^{\infty} \frac{2^k (k!)^2}{(2k+1)!}$$
			Fill up the dashed lines in the program
			#include <stdio.h>
			int main ()
			{
			double sum = _____;
			double term = _____;
			int k = _____;
			for(; k < 10000; ++k) {
			term = _____;
			sum = _____;
			}
			sum = _____ ;
			printf("%lf", sum);
			return 0;
			}
				04	CO4	BL4

		(ii)	Write a recursive function for finding length of strings and display the string the string in front and reverse order.	04	CO3	BL5
Q.4	(a)	(i)	Write a Program using pointers to find whether the two strings are anagram or not. For Example: LISTEN and SILENT are two anagram strings.	04	CO3	BL4
		(ii)	Given the current time and time required for a class, it is desired to find out the time when the class ends. Write a structure to represent time in hour, minutes, and seconds. Also write a function which gets the current time and class time, and returns the end time of class.	04	CO3	BL5
			OR			
	(b)	(i)	The absolute distance between two integers x1 and x2 is given by |x2-x2|. Write a function which sorts an array x[ ] of n integers in ascending order of their absolute distances with a given number z. For example, given x[ ]= {9, 1, 12, 4, 2} and z=6, the sorted array will be x[ ]= {4, 9, 2, 1, 12}. Note that 4 is closest to 6, and 12 is farthest from 6 in terms of absolute distance. The function Prototype will be: void sort_abs (int x[ ], int n, int z);	04	CO4	BL4

		(ii)	Write a program which uses a structure that read roll number, name, and percentage of 5 students. If the percentage of the student is greater than 70 then write its information to the file 'F1.txt' otherwise write it to file 'F2.txt'.	04	CO4	BL5
Q.5	(a)	(i)	Enlist the major differences between procedures oriented and object oriented programming languages.	04	CO4	BL4
		(ii)	Differentiate between the following with programming example: i) Function overloading and Operator overloading ii) Object and Class iii) Abstraction and Encapsulation	04	CO4	BL2, BL3
			OR			
	(b)	(i)	Differentiate between the following with programming example: i) Overloading and overriding ii) Multiple Inheritance and multilevel inheritance iii) Static binding and dynamic binding	04	CO4	BL2, BL3
		(ii)	Enlist the major advantages of C++ programming language. Justify your answer using a programming example.	04	CO4	BL4
			xxxxx			

JUNE-JULY 2022 EXAMINATION
I B.Tech. (4YDC) EXAMINATION
CO 10504: COMPUTER PROGRAMMING

Time: 3 Hrs.] **[Max. Marks :70**
[Min Marks :22

TOTAL NO. OF QUESTIONS IN THIS PAPER: 5

NOTE: 1) Answer to the point and make assumptions wherever required and clearly state them. Assume C programming language wherever required. 2) Attempt all parts of same question at one place and each question carries five sub parts a, b, c, d, e. Part a, b, c is compulsory and attempt any one from d and e.

		Marks	CO	BT	PI
Q.1	(a) Explain how negative numbers are represented in the computer memory? Give one example.	02	CO1	BT2	1.2.1
	(b) Identify the most appropriate answer of the following : i) _____ are the memory of the CPU. ii) 2MB is equivalent to _____ bits. iii) _____ command is used delete the file in Linux operating system. iv) 'gedit' is an example of _____ software.	02	CO1	BT1	1.7.1
	(c) Draw a flowchart to take four points from user (x1,y1), (x2,y2), (x3,y3) and (x4,y4) and find out if these points form an parallelogram or not.	03	CO1	BT3	2.5.2
	(d) Differentiate between the following with the help of an example: i) Source code file and executable file ii) Unary operators and ternary operator iii) short int and long int iv) Type conversion and type casting	07	CO1	BT2	1.7.1
	OR				
	(e) Solve the following : i) $(A245.219)_{13} = (?)_6$ (ii) $(F3.1532)_{17} = (?)_8$ iii) $(1B123.CA2)_{19} = (?)_5$ (iv) $(1341.567)_9 = (?)_{16}$	07	CO1	BT3	1.2.1
Q.2	(a) What is the difference between constant using #define macro and const keyword?	02	CO1	BT2	1.7.1
	(b) Discuss about iterative statements? What are the different types of iterative statements in C?	02	CO2	BT2	1.7.1
	(c) What is an identifier (variable)? What are the rules to construct identifier (variable)? Classify the following as valid/invalid Identifiers. i) num2 ii) $num1 iii) +add iv) a_2 v) 199_space vi) _apple	03	CO2	BT2	1.7.1

	(d) Evaluate the expressions for the following, assume that the variables are declared and initialized as follows:
	int x = 1, y = 2, z = 3;
	float a = 1.1, b = 2.2, c = 3.3;
	i) a * z % y * (int)c / 5 && y > x || y++ ;
	ii) ++x / 2 / y++ * z / x++ *a && z;
	iii) (x < = z) || (++y > b * ++x) && (z >= 5 * int(c)) ;
		07	CO2	BT5	1.2.1

	OR				
	(e) Write a program which reads an integer n > 10 and a real variable x, 0<=|x|<=1. Compute and print the sum of the series upto n terms: $\sin^{-1}(x) = x + \frac{1}{2}\cdot\frac{x^3}{3} + \frac{1}{2}\cdot\frac{3}{4}\cdot\frac{x^5}{5} + \cdots + \frac{1}{2}\cdot\frac{3}{4}\cdot\frac{5}{6}X \ldots X\frac{2i-3}{2i-2}\cdot\frac{x^{2i-1}}{2i-1} + \cdots$ The program should NOT use any standard library function.	07	CO3	BT4	2.6.3
Q.3	(a) Differentiate between printf( ), fprintf( ), puts( ), and fputs( ).	02	CO3	BT2	2.6.4
	(b) Tabulate the scope and life time of the following : (i)External variable (ii) Static variable (iii) Automatic variable (iv) Register variable	02	CO3	BT1	1.7.1
	(c) Write a C function isprime(num) that accepts an integer argument and returns 1 if the argument is a prime or 0 otherwise. Write a program that invokes this function to generate prime numbers between the given ranges.	03	CO3	BT4	4.6.3
	(d) Write a recursive program to calculate the value of nCr. nCr is the number of ways of selecting r items given n items. The recurrence for calculating nCr is given by: $nCr = {}^{n-1}C_r + {}^{n-1}C_{r-1}$. Assume that n>=r.	07	CO3	BT4	4.5.1
	OR				
	(e) Consider the Peasants' Algorithm for multiplication of two positive integers. It works in the	07	CO4	BT4	4.6.3

following manner.

i. Write the two numbers in two columns.
ii. Keep updating according to the following procedure until the number in the first (i.e., left) column becomes 1.
iii. Halve the number in first column (integer division), double the number in the second column.
iv. At the end, sum up all the numbers in the second column, for which, corresponding number in the first column is odd.

Example of multiplication using Peasants' algorithm: 13 x 8: 64+32+8 = 108

13	8
6	16
3	32
1	64

Fill in appropriate blanks in function for calculating multiplication using Peasants' Algorithm.

```
void peasantMultiplication(int num_col1, int num _col2.int answer)
{
 int count=0;
   while(1){
    count++;
     if( _______ )
       answer = _____ + _____ ;
     if( _____ )
        _____;
     num_in_col1 = _____ / 2;
     num_in_col2 = _____ *2; } }
```

Q.4	(a)	Explain the following: i. Write a statement to read a file in append mode. ii. Write the purpose of the fseek() function.	02	CO4	BT2	1.7.1
	(b)	Is it possible to return multiple values from a function? Justify the statement with the help of an example.	02	CO3	BT2	2.5.2
	(c)	Write a program that takes string as input from the user and replaces each alphabet in the string with next alphabet except letters "z" "Z" and "a" "A". For example- Input string: "Programming in Z is fun" Output String: "Qsphsannjoh jo Z jt gvo"	03	CO4	BT3	4.4.2
	(d)	Write a program to read details of 'n' number of employees from keyboard. The employee record should have three fields (id, name, salary). Print the details of employees whose salary is above 5000 and also store the information in file having name record.txt.	07	CO4	BT3	4.5.1
		OR				
	(e)	A rectangle has two sides parallel to the x and y axis. Define a structure 'rectangle' to store coordinates of lower left and upper right vertices defined by following structure 'point'. typedef struct{ float x; float y; }point; Write a function: int inside(point p, struct rectangle r) that returns 1 if the point p is inside or on the rectangle, and 0 otherwise.	07	CO3, CO4	BT3	4.5.1
Q.5	(a)	Differentiate between the class and object. Explain with the help of programming example.	02	CO4	BT2	1.7.1
	(b)	Explain the visibility of base class members for the access specifiers: private, protected, and public.	02	CO4	BT2	1.7.1
	(c)	Explain the concept of polymorphism with the help of programming example.	03	CO4	BT2	1.7.1
	(d)	Differentiate between the following: (i) Function overloading and Operator overloading (ii) Abstraction and Encapsulation (iii) Static and Dynamic binding (iv) Multiple Inheritance and Multilevel Inheritance	07	CO4	BT2	1.7.1
		OR				
	(e)	(i) Enlist the major differences between procedures oriented and object oriented programming language.	03	CO4	BT1	1.7.1
		(ii) Explain the concept of Inheritance. Demonstrate its use using programming example.	04	CO4	BT3	4.4.2

XXXXX

FEBRUARY 2023 EXAMINATION **Exam code: 1211**

I B.E. (4YDC)

HU 10651 / **HU 10551: TECHNICAL ENGLISH**

Time: 3 Hrs.

Max. Marks: 70

Min. Pass Marks: 22

TOTAL NO. OF QUESTIONS IN THIS PAPER = 5

NOTE: Attempt all the questions and do not reveal your identity in the paper.

Q.No.	Questions	Marks	CO	BL	PI
Q.1.(a)	Give any two tips for effective communication.	(2)	1	L1	10.4.1
Q.1.(b)	Define Noise in Communication	(2)	1	L1	10.4.1
Q.1.(c)	Enlist types of non-verbal communication	(3)	1	L3	10.5.2
Q.1.(d)	Draw the communication cycle and state the important elements. OR Explain different steps to be followed while making a formal presentation.	(7)	1	L4,2	10.5.2
Q.2 (a)	Define vowel sounds.	(2)	2	L1	9.5.1
Q.2.(b)	Define Phonetics.	(2)	2	L1	9.5.1
Q.2.(c)	Define diphthongs and list down their symbols.	(3)	2	L1	9.5.1
Q.2.(d)	Identify all the consonant sounds in the following words and give their symbols (ANY THREE) (i) lap (ii) pool (iii) tray (iv) noise (v) bird (vi) lid OR Transcribe the following words (**ANY SIX**) (i) bun (ii) fake (iii) valve (iv) banana (v) apple (v) boy	(7)	2	L3,L5	9.5.1
Q.3 (a)	Where the title to the précis should be given?	(2)	3	L1	10.4.1
Q.3(b)	What are the steps for writing a précis?	(2)	3	L2.	10.4.1
Q.3(c)	How do you structure an essay?	(3)	3	L2	10.4.3
Q.3(d)	Write an essay in approximately 250 words on **ANY ONE** of the following topics: (i) Massive lay-offs in top IT companies	(7)	3	L5	10.4.2

	(ii) Indian Air Force: a review (iii) How can e-technology help farmers come out of distress? (iv) Impact of e-commerce on businesses (v) Annual budget: pros and cons (vi) Start up Eco system in India				
Q.4(a)	Define Technical Report.	(2)	4	L1	10.6.1
Q.4(b)	State the role of Table of Contents in a technical report.	(2)	4	L1	10.6.1
Q.4(c)	Write the significance of List of References in a Technical Report.	(3)	4	L3	10.6.1
Q.4(d)	Prepare a technical report (only Main Body) on 'Successful strategy to fight with COVID19 in India'. **OR** Draft a technical report (Front Matter elements only) on the prospects and challenges of online classroom.	(7)	4	L5	10.6.1
Q.5(a)	**Briefly describe the functions of a business letter.**	(2)	5	L2	9.5.1
Q.5(b)	What are the various types of business letters?	(2)	5	L1	9.5.1
Q.5(c)	Evaluate the role of Subject in formal letters.	(3)	5	L4	9.5.1
Q.5(d)	Write a job application, with a structured Resume, **OR** As the Manager of an electronics company, draft a letter inviting quotation for microwaves, refrigerators and television sets to various suppliers.	(7)	5	L5	9.5.1

JUNE-JULY 2022 EXAMINATION **Exam code: 978**

I B.E. (4YDC)

HU 10651: TECHNICAL ENGLISH

Time: 3 Hrs. **Max. Marks: 70**

Min. Pass Marks: 22

TOTAL NO. OF QUESTIONS IN THIS PAPER = 6

NOTE: Attempt all the questions and do not reveal your identity in the paper.

Q.No.	Questions	Marks	CO	BL	PI
Q.1.	Define communication. Enlist and explain the various objectives of communication in an organization. OR 'Organizing the content and preparing an outline plays a vital role in presentation'. Explain.	(10)	1	2	9.5.1
Q.2.	Identify all the vowel sounds in the following words and give their symbols(**ANY FIVE**) (i)howl(ii)clerk (iii) window(iv) fuel(v) music(vi)gluttony (vii)suite (viii) vote OR Transcribe the following words(**ANY FIVE**) (i)hospital(ii)transparent(iii)box(iv)vaccine(v)flower(vi)bear (vii)great (viii) learn	(10)	2	1,3	10.5.2
Q.3	Write an essay in approximately 300 words on **ANY ONE** of the following topics: (i) Higher education versus skill acquisition (ii) Contribution of technology in education (iii) Artificial intelligence: a threat to humanity (iv) Global recession and shapes of economy (v) Addiction to social media (vi) Nuclear weapons: world at the verge of destruction	(12)	3	3	10.4.2
Q. 4	Read the given passage carefully and answer the questions that follow: One great defect of our civilization is that it does not know what to do with its knowledge. Science, as we have seen, has given us powers fit for the gods, yet we use them like small children.For example: - we do not know how to manage our machines. Machines were made to be man's servants; yet he has grown so dependent on them that they are in a fair way to become his masters. Already most men spend most of their lives looking after and waiting upon machines. And the machines are very stern masters. They must be fed with coal, and given petrol to drink, and oil to wash with, and must be kept at the right temperature. And if they do not get their meals when they expect them, they grow sulky and refuse to work, or burst with rage, and blow up, and spread ruin and destruction all round them, So we have to wait upon them very attentively and do all that we can to keep	(12)	3	2	3.5.1

	them in a good temper. Already we find it difficult either to work or play without the machines, and a time may come when they will rule us all together, just as we rule the animals. (i) Make a précis of the given passage and provide an appropriate title to it. (ii) What kind of maintenance is required for machines? (iii) What will happen if the machines are not taken care of properly? (iv) State any real life example which indicates a similar problem stated in the above passage. (v) Give the antonym of 'authority' from the passage.				
Q.5	Prepare a technical report on "The possibility of World War III". **OR** Assuming yourself to be the Head of Electronics Department of your Institution, write a report of trouble on the fire caused in the laboratory of your Department. Invent the necessary details.	(14)	4	3	10.4.2,10.6.1
Q.6	Write a letter of Application with a systematic resume. **OR** Adya Fashions, Bhavnagar is interested to place a large order for readymade garments manufactured by Fashion Fabrics Limited, Jaipur. Draft a letter inquiring the Quotations and product details from Adya Fashions.	(12)	5	3	9.5.1

FEBRUARY 2022 EXAMINATION **Exam code: 2258**

I B.E. (4YDC)

HU 10651: TECHNICAL ENGLISH

Time: 90 mins.

Max. Marks: 40

TOTAL NO. OF QUESTIONS IN THIS PAPER = 5

NOTE: Attempt all the questions and do not reveal your identity in the paper.

Q.No.	Questions	Marks	CO	BL	PI
Q.1.	Explain the principles of effective communication with suitable examples. OR What are the four important aspects to be considered while planning for your presentation?	(8)	1	1,2	10.5.2
Q.2.	Identify all the consonant sounds in the following words and give their symbols (**ANY FOUR**) (i) path (ii) terrible (iii) exam (iv) favour (v) camera (vi) humble (vii) phone OR Transcribe the following words (**ANY FOUR**) (i) poll (ii) fowl (iii) fascinate (iv) align (v) favour (v) daughter (vi) camouflage	(8)	2	1,3	9.5.1
Q.3	Write an essay in approximately 250 words on **ANY ONE** of the following topics: (i)Is it ethical to replace human workers with automation? (ii)Should assisted suicide be legal? (iii)Union Budget 2022-23 (iv)Rewriting Modern Indian history: pros and cons (v)E-vehicles: the future of transportation	(8)	3	3	10.4.2
Q.4	The production target for the first six months in an automobile industry has declined by 25 per cent as compared to last year. As the Production Manager, draft a report(only Front Matter and Back Matter) to the General Manager stating the reasons for the fall and suggest remedial measures for improvement. **OR** Draft a technical report (only Front Matter and Main Body) on "Water crisis in Indore"	(8)	4	3	10.6.1
Q.5	Write a job application, with a structured Resume. **OR** Write a letter to Municipal Commissioner of your .city complaining him about the poor water supply in your locality	(8)	5	3	9.5.1

FEBRUARY 2022 EXAMINATION — Exam code: 2258

I B.E. (AYDC)

HE 10651: TECHNICAL ENGLISH

Time: 90 mins. — Max. Marks: 40

TOTAL NO. OF QUESTIONS IN THIS PAPER = 5

NOTE: Attempt all the questions and do not reveal your identity in the paper.

Q.No.	Questions	Marks	CO	BL	PI
Q.1.	Explain the principles of effective communication with suitable examples. OR What are the four important aspects to be considered while planning for your presentation?	(8)	1	L2	10.5.2
Q.2.	Identify all the consonant sounds in the following words and give their symbols (ANY FOUR) (i) path (ii) terrible (iii) exam (iv) favour (v) camera (vi) bumble (vii) phone OR Transcribe the following words (ANY FOUR) (i) poll (ii) howl (iii) fascinate (iv) align (v) favour (v) daughter (vi) camouflage	(8)	2	L3	9.5.1
Q.3	Write an essay in approximately 250 words on ANY ONE of the following topics: (i) Is it ethical to replace human workers with automation? (ii) Should assisted suicide be legal? (iii) Union Budget 2022-23 (iv) Reviving Modern Indian history: pros and cons (v) E-vehicles: the future of transportation	(8)	3	3	10.4.2
Q.4	The production target for the first six months in an automobile industry has declined by 25 per cent as compared to last year. As the Production Manager, draft a report only From Matter and Back Matter) to the General Manager stating the reasons for the fall and suggest remedial measures for improvement. OR Draft a technical report (only From Matter and Main Body) on "Water crisis in Indore"	(8)	4	3	10.6.1
Q.5	Write a job application, with a structured Resume OR Write a letter to Municipal Commissioner of your city complaining him about the poor water supply in your locality	(8)	5	4	9.5.1

Exam Code 1232

FEB. 2023 EXAMINATION
I B.E./B.TECH. (4YDC) EXAM
MA 10501: MATHEMATICS - II

Time : 3 Hrs.] **[Max. Marks : 70**

TOTAL NO. OF QUESTIONS IN THIS PAPER : 5

Note : Each question carry five subparts a, b , c, d and e. Attempt subparts a, b, c and any one from d or e in each question. All questions carry equal marks.

			MARKS	CO	BL	PI
Q.1	(a)	If A and B are two unitary matrices, show that AB is a unitary matrix.	02	CO1	BL-1	1.1.1
	(b)	Express the matrix $A=\begin{bmatrix} 1+i & 2 & 5-5i \\ 2i & 2+i & 4+2i \\ -1+i & -4 & 7 \end{bmatrix}$ as the sum of Hermitian matrix and skew- Hermitian matrix.	02	CO1	BL-2	1.1.1
	(c)	Examine the following vectors for linear dependence $X_1=(1,2,4), X_2=(2,-1,3), X_3=(0,1,2), X_4=(-3,7,2)$	03	CO1	BL-2	1.1.1
	(d)	Discuss the consistency of the following system of equations and if consistent solve the equations : $2x-3y+7z=5, 3x+y-3z=13, 2x+19y-47z=32$	07	CO1	BL-3	1.1.1
		OR				
	(e)	Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$. and hence find A^{-1}.	07	CO1	BL-3	1.1.1
Q.2	(a)	Find differential equation of which $y=e^x(A\cos x+B\sin x)$ is a solution.	02	CO2	BL-1	1.1.1
	(b)	Define exact differential equation with example.	02	CO2	BL-2	1.1.1
	(c)	Solve $(1+y^2)dx=(\tan^{-1}y-x)dy$	03	CO2	BL-2	1.1.1
	(d)	Solve $(2x\log x-xy)dy+2ydx=0$	07	CO2	BL-2	1.1.1
		OR				
	(e)	Solve $\frac{d^2y}{dx^2}-5\frac{dy}{dx}+6y=x\cos 2x$.	07	CO2	BL-2	1.1.1
Q.3	(a)	Solve $4x^2\frac{d^2y}{dx^2}+16x\frac{dy}{dx}+9y=0$	02	CO3	BL-1	1.1.1
	(b)	Write the step of method of variation of parameters.	02	CO3	BL-2	1.1.1
	(c)	Find the particular integral of differential equation $x^2\frac{d^2y}{dx^2}+4x\frac{dy}{dx}+2y=e^x$	03	CO3	BL-2	1.1.1

	(d)	Solve the following simultaneous differential equation $\frac{dx}{dt}+4x+3y=t, \frac{dy}{dt}+2x+5y=e^t$	07	CO3	BL-2	2.4.1
		OR				
	(e)	A constant electromotive force E volts is applied to a circuit containing a constant resistance R ohms in series and a constant inductance L henries. If the initial current is zero, show that the current builds upto half its theoretical maximum in (L log2) / R seconds.	07	CO3	BL-3	2.4.1
Q.4	(a)	Define Normal distribution and its properties.	02	CO4	BL-1	1.1.1
	(b)	Prove that the Poisson distribution is limiting case of Binomial distribution.	02	CO4	BL-1	1.1.1
	(c)	By the method of least squares, find the straight line that best fits the following data : x: 1 2 3 4 5 y: 14 27 40 55 68	03	CO4	BL-2	1.1.1
	(d)	Derive the mean and variance of Binomial Distribution.	07	CO4	BL-2	1.1.1
		OR				
	(e)	If the probability that an individual suffers a bad reaction from a certain injection is 0.001, determine the probability that out of 2000 individuals (i) Exactly 3 (ii) more than 2 individuals (iii) None (iv) more than 1 individuals will suffer a bad reaction.	07	CO4	BL-2	1
Q.5	(a)	State Demoivre's theorem and write its applications.	02	CO5	BL1	1.1.1
	(b)	Find the general value of $\log(-3)$.	02	CO5	BL-1	1.1.1
	(c)	Prove that $\tanh Z$ and $\sinh Z$ are periodic function and find their periods.	03	CO5	BL-2	1.1.1
	(d)	If $u=\log\tan\left(\frac{\pi}{4}+\frac{\theta}{2}\right)$, then prove that (i) $\tanh\frac{u}{2}=\tan\frac{\theta}{2}$ and (ii) $\cosh u=\sec\theta$.	07	CO5	BL-2	1.1.1
		OR				
	(e)	Sum the series $\sin\alpha\cos\beta-\frac{1}{2}\sin^2\alpha\cos 2\beta+\frac{1}{3}\sin^3\alpha\cos 3\beta-.....\infty$.	07	CO5	BL-3	1.1.1

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Code: 937

JUNE-JULY 2022 EXAMINATION

I B.E/B. TECH EXAM

MA 10501:-MATHEMATICS-II

Time: 3 Hrs.] [Max. Marks: 70

TOTAL NO. OF QUESTIONS IN THIS PAPER:5

Note: Attempt all questions. All questions carry equal marks. Each question carries five subparts a, b, c, d and e. Parts a, b and c are compulsory and attempt any one from d and e.

S. No.		Questions	Marks	CO	BL	PI
Q.1	(a)	Show that $A = \begin{bmatrix} -i & 3+2i & -2-i \\ -3+2i & 0 & 3-4i \\ 2-i & -3-4i & -2i \end{bmatrix}$ is skew Hermitian matrix.	(02)	CO1	1	1.1.1
	(b)	Find the characteristic roots of the matrix $\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$	(02)	CO1	1,2	1.1.1
	(c)	State and prove Cayley Hamilton theorem.	(03)	CO1	1,2	1.1.1
	(d)	Determine the values of λ *and* μ such that the system $2x-5y+2z=8, 2x+4y+6z=5, x+2y+\lambda z=\mu$ Have (i) No solution (ii) A Unique Solution (iii) Infinite number of solution.	(07)	CO1	3	1.1.1
		OR				
	(e)	Reduce the following matrix to normal form and find its rank $A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{bmatrix}$	(07)	CO1	4	1.1.1
Q.2	(a)	Form the differential equation by eliminating the arbitrary constant $y^2 = m(a^2 - x^2)$	(02)	CO2	1	1.1.1
	(b)	Solve $\frac{dy}{dx} = e^{3x-2y} + x^2 e^{-2y}$	(02)	CO2	1,2	1.1.1
	(c)	Solve $[1+\log(xy)]dx + \left[1+\frac{x}{y}\right]dy = 0$	(03)	CO2	2	1.1.1
	(d)	Solve $x\frac{dy}{dx} + y = y^2 logx$	(07)	CO2	1,3	1.1.1
		OR				
	(e)	Solve $\frac{d^2y}{dx^2} + y = e^{-x} + cosx + x^3 + e^x sinx$	(07)	CO2	1,3	1.1.1

Q.3	(a)	Find the Complimentary function of the differential equation $$x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} - 3y = 0$$	(02)	CO3	1	1.1.1
	(b)	Write down the basic steps for solving the method of variation of parameter.	(02)	CO3	2	1.1.1
	(c)	Find the Particular integral of $$(1+x)^2\frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + y = Sin[2\{\log(1+x)\}]$$	(03)	CO3	1,2	1.1.1
	(d)	Solve $\frac{dx}{dt} + 5x + y = e^t, \frac{dy}{dt} - x + 3y = e^{2t}$	(07)	CO3	3	1.1.1
		OR				
	(e)	A coil having a resistance of 15 ohms. And an inductance of 10 henries is connected to a 90 volts supply. Determine the value of the current after 2 seconds. $(e^{-3} = 0.05)$	(07)	CO3	1,2	1.1.1
Q.4	(a)	The mean and variance of a binomial distribution $P(X,n,p)$ are 4 and $^4/_3$ respectively. Find $P(X=2)$.	(02)	CO4	1	1.1.1
	(b)	Derive the recurrence formula for Poisson distribution	(02)	CO4	1	1.1.1
	(c)	The life of army shoes is normally distributed with mean 8 months and standard deviation 2 months. If 5000 pairs are insured, how many pairs would be expected to need replacement after 12 months? $(Given\ that\ P(Z \geq 2) = 0.0228\ and\ Z = \frac{X-\mu}{\sigma})$	(03)	CO4	2	1.1.1
	(d)	Derive the formula of mean and variance for binomial distribution.	(07)	CO4	3	1.1.1
		OR				
	(e)	Fit a second degree parabola to the following data taking y as dependent variable X 1 2 3 4 5 6 7 8 9 Y 2 6 7 8 10 11 11 10 9	(07)	CO4	3	1.1.1
Q.5	(a)	Separate $sec(x+iy)$ into real and imaginary parts.	(02)	CO5	2	1.1.1
	(b)	Express $\frac{(6+i)(2-i)}{(4+3i)(1-2i)}$ in the form of $a+ib$.	(02)	CO5	2	1.1.1
	(c)	Prove that $sech^{-1}x = log\frac{1+\sqrt{1-x^2}}{x}$	(03)	CO5	3	1.1.1
	(d)	If $\alpha, \alpha^2, \alpha^3, \alpha^4$ are the roots of $x^5 - 1 = 0$ find them and show that $(1-\alpha)(1-\alpha^2)(1-\alpha^3)(1-\alpha^4) = 5$.	(07)	CO5	3	1.1.1
		OR				
	(e)	Sum the series $Sin\alpha - \frac{Sin(\alpha+2\beta)}{2!} + \frac{Sin(\alpha+4\beta)}{4!} - \cdots \infty$	(07)	CO5	3	1.1.1

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ONLINE FEB. 2022 EXAMINATION

B.E. /B.TECH EXAM

MA 10501:- MATHEMATICS-II

Time:90 Minutes] **[Max. Marks: 40**

PART B: Descriptive Questions

TOTAL NO. OF QUESTIONS IN THIS PAPER : 5

Note: Each question carry three subparts a, b and c. Attempt any two from a, b and c. All questions carry equal marks.

S. No.		Questions	Marks	C0	BL	PI
Q.1	(a)	Reduce the matrix A into its normal form where $A=\begin{bmatrix} 1 & 2 & 0 & -1 \\ 3 & 4 & 1 & 2 \\ -2 & 3 & 2 & 5 \end{bmatrix}$ and hence obtain its rank.	(04)	CO1	2	1.1.1
	(b)	Find the Eigen values and Eigen vectors of the matrix $A=\begin{bmatrix} 3 & 2 & 4 \\ 2 & 0 & 2 \\ 4 & 2 & 3 \end{bmatrix}$	(04)	CO1	2,3	1.1.1
	(c)	Investigate the values of λ and μ so that the equations $2x+3y+5z=9,\ 7x+3y-2z=8,\ 2x+3y+\lambda z=\mu$ have (i)no solution (ii)a unique solution (iii)an infinite number of solutions.	(04)	CO1	2	1.1.1
Q.2	(a)	Solve $\frac{dy}{dx}=\frac{y-x+1}{y+x+5}$	(04)	CO2	2	1.1.1
	(b)	Solve $(x^2+y^2)dx-2xydy=0$	(04)	CO2	2	1.1.1
	(c)	Solve $(D^2+2D+4)y=e^x\sin 2x$	(04)	CO2	2	1.1.1

Q.3	**(a)**	Solve $x^2\frac{d^2y}{dx^2}-2x\frac{dy}{dx}-4y=x^2+2\log x$	**(04)**	**CO3**	**2**	**1.1.1**
	(b)	Solve $x^2\frac{d^2y}{dx^2}+x\frac{dy}{dx}-y=x^2e^x$ by method of variation of parameters.	**(04)**	**CO3**	**3**	**1.1.1**
	(c)	The equations of electromotive force in terms of current i for an electrical circuit having resistance R and a condenser of capacity C, in series is $E=Ri+\int\frac{i}{C}dt$. Find the current i at any time t , when $E=E_0\sin wt$.	**(04)**	**CO3**	**3**	**1.1.1**
Q.4	**(a)**	Fit an exponential curve $y=ab^x$ to the following data x: 1, 2, 3, 4, 5, 6, 7, 8 y: 1.0, 1.2, 1.8, 2.5, 3.6, 4.7, 6.6, 9.1	**(04)**	**CO4**	**3**	**1.1.1**
	(b)	In 800 families with 4 children each, how many families would be expected to have (i)2 boys and 2 girls (ii) at least 1 boy (iii)no girl . Assuming equal probabilities for girls and boys.	**(04)**	**CO4**	**2**	**1.1.1**
	(c)	If 2% of light bulbs are defective, find the probability that (i) at least one is defective and (ii)exactly 7 are defective . Also find P(1<X<8) in a sample of 100.	**(04)**	**CO4**	**2**	**1.1.1**
Q.5	**(a)**	Express $Log(Logi)$ in the form $A+iB$.	**(04)**	**CO5**	**2**	**1.1.1**
	(b)	Sum the series $1+\frac{\cos\alpha}{\cos\alpha}+\frac{\cos 2\alpha}{2!\cos^2\alpha}+\frac{\cos 3\alpha}{3!\cos^3\alpha}+-----\infty$	**(04)**	**CO5**	**2**	**1.1.1**
	(c)	If $u=\log_e[\tan\left(\frac{\pi}{4}+\frac{\theta}{2}\right)$ prove that $\tan h\frac{u}{2}=\tan\frac{\theta}{2}$	**(04)**	**CO5**	**2**	**1.1.1**

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