

Enrolment No.

S O E 24201010294



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Established under Govt. of Maharashtra Act No. V of 2023
Sate, Maval (PMRDA) Dist - Pune, Maharashtra - 412 106.



End-Semester Assessment – Apr/May- 2025

Program: B. Tech-1st year

Semester: II

Maximum Marks: 60 marks

Time: 2.5 hrs.

Course Name: Basic Electrical Engineering

Course Code: UBTFY106 II

Course Outcomes (CLO):

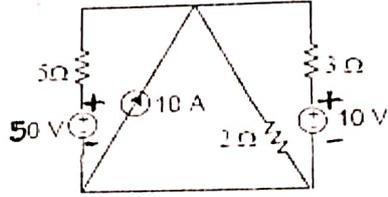
1. Apply Kirchoff's laws and star delta Techniques to analyze the D C Circuits.
2. Apply and analyze different network theorems for D C Circuit.
3. To Differentiate between electrical and magnetic circuits and derive mathematical relations between self, mutual inductance.
4. Apply and derive the expressions for current, voltage and power in A C circuit.
5. Understand phase and line quantities in a poly-phase network and the working principle of a single-phase transformer.

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. etc.
- Assume missing data suitably, if any.

Question	CO	LO	Marks
Q.1) Attempt any TWO of the following	CO1		(10 marks)
a) Derive the expression for converting star (R_1, R_2, R_3) to equivalent delta (R_{12}, R_{23}, R_{31}) Resistances		KL3	[5 Marks]
b) Find the voltage at nodes 1 and 2.		KL3	[5 Marks]
c) Define Resistance Explain the effect of temperature on resistance in terms of temperature coefficient of Resistance.		KL2	[5 Marks]
Q.2) Attempt any TWO of the following	CO2		(10 marks)
a) Find the voltage across 30 Ω resistance by using superposition theorem		KL3	[5 Marks]
b) What is the Maximum Power transfer theorem and derive the condition $R_L = R_{th}$		KL2	[5 Marks]

c) Using source transformation find the power delivered by 50 V source as shown in Figure



Q.3) Attempt any TWO of the following

CO3

(10 marks)

a) Define the following terms
1) Flux Density. 2) Reluctance. 3) Magneto motive Force. 4) Magnetic Field Strength. 5) Permeability.

KI.2

[5 Marks]

b) Write a short note on Series magnetic Circuit

KI.3

[5 Marks]

c) A flux of 0.5mwb is produced by a coil of 900 turns wound on a ring with a current of 3A in it, Calculate
1) Inductance of the coil. 2) emf induced in the coil when a current of 5A fall to zero in 1m-sec.3) Mutal inductance between the coil if second coil of 600 turn is uniformly wound over the first coil

KI.3

[5 Marks]

Q.4 Attempt any TWO of the following

CO4

(10 marks)

a) Prove that current lags the voltage by 90° for the purely inductive circuit. Draw circuit diagram, waveforms, and phasor diagram.

KI.3

[5 Marks]

b) Define the Average value and hence derive the expression for the average value.

KI.3

[5 Marks]

c) An ac circuit consists of a pure resistance of 10 ohms and is connected across an ac supply of 230 V, 50 Hz. Calculate (i) current, (ii) power consumed, (iii) power factor, and (iv) write down the equations for voltage and current.

KI.3

[5 Marks]

Q.5) Attempt any FOUR of the following

CO5

(20 marks)

a) Derive the expression for i) Line voltage, phase voltage ii) Line current, phase current, and iii) Power for Star Connected Load in three Phase System. Draw phasor diagram.

KI.3

[5 Marks]

b) Write the difference between Core type and Shell type Transformer.

KI.2

[5 Marks]

c) Explain how three phase supply is generated. State Equations of phase voltages. Draw three phase waveform.

KI.2

[5 Marks]

d) Explain the losses in the transformer

KI.2

[5 Marks]

e) An 80 kVA, 3200/400 V, 50 Hz single-phase transformer has 111 turns on the secondary winding. Calculate (i) number of turns on primary winding, (ii) secondary current, and (iii) cross-sectional area of the core, if the maximum flux density is 1.2 Tesla

KI.3

[5 Marks]

f) Three similar coils A, B, and C is available. Each coil has 9 Ω resistance in series with an inductive reactance of 12 Ω . They are connected in delta to a three-phase, 440 V, 50 Hz supply. Calculate for this load, the (i) phase current, (ii) line current, (iii) power factor, (iv) Apparent (Total) power, (v) Active power

KI.3

[5 Marks]

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End-Semester Assessment – April/May- 2025

Program : B.Tech

Semester: II

Maximum Marks: 60 marks

Time: 2.5 hrs.

Course Name: Object Oriented Programming

Course Code: UBTFY116

Course Learning Outcomes (CLOs):

1. To introduce students to the fundamental principles of object-oriented programming.
2. Apply the principles of object-oriented programming to define and implement classes and objects.
3. Utilize constructors and destructors to manage object lifecycles effectively.
4. To familiarize students with the concept of inheritance in object-oriented programming.
5. Implement Exception Handling and Polymorphism to design flexible and adaptable solutions.

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. etc.

Question	CLO	BL	Marks
Q.1) Attempt any two of the following			(10 marks)
a) Describe the features of OOP with examples:	CLO1	BL2	(5 marks)
b) Why is there a need for Object Oriented Programming? Describe structure of a C++ program.	CLO1	BL2	(5 marks)
c) Write a C++ program to Find the Largest of Two Numbers, take user input.	CLO1	BL3	(5 marks)
Q.2) Attempt any two of the following			(10 marks)
a) How can one class access another class's private data using friend classes or functions? Illustrate with an example.	CLO2	BL2	(5 marks)
b) What is the significance of access specifiers (public, private, protected) in a class? Explain each with a short example.	CLO2	BL2	(5 marks)
c) Create a class Book in C++ with data members title, author, and price. Write member functions to read and print book details.	CLO2	BL3	(5 marks)
Q.3) Attempt any two of the following			(10 marks)
a) Describe the syntax and use of a class constructor in C++. How does a constructor differ from a regular member function?	CLO3	BL2	(5 marks)

✓b) Describe the lifecycle of an object in C++ What roles do constructors and destructors play? Give a brief example	CLO3	BL2	(5 marks)
∅ Create a class Car with a default constructor that initializes the car's make and model to "Unknown." The destructor should display a message when the object is destroyed.	CLO3	BL3	(5 marks)
Q.4) Attempt any two of the following			(10 marks)
a) What is inheritance in C++? Explain its advantages with example.	CLO4	BL2	(5 marks)
b) What is the mode of inheritance? Describe the difference between public, protected, and private inheritance with examples.	CLO4	BL2	(5 marks)
c) Write a C++ program to demonstrate Multiple Inheritance using an addition and subtraction operation. Create a base class Addition with two data members num1 and num2, and a function to perform addition. Create another base class Subtraction with two data members num3 and num4, and a function to perform subtraction. Create a derived class Calculator that inherits from both Addition and Subtraction, and includes a function to display the results.	CLO4	BL3	(5 marks)
Q.5) Attempt any four of the following			(20 marks)
∂) Differentiate between compile-time polymorphism and runtime polymorphism with examples.	CLO5	BL2	(5 marks)
✓b) Explain the need for the virtual keyword in C++ polymorphism. With a suitable C++ code.	CLO5	BL2	(5 marks)
✓c) Explain operator overloading and its significance.	CLO5	BL2	(5 marks)
∂) How to catch all types of exceptions in C++? Write a C++ program to catch divide-by-zero errors using exception handling.	CLO5	BL2	(5 marks)
✓e) Write a C++ program to write data to a file.	CLO5	BL3	(5 marks)
f) Create an abstract class Shape with a pure virtual function calculateArea() and a member function getDimension() to input a single float value. Derive two classes: Circle: calculates area of a circle Square: calculates area of a square calculate and display the area of each shape.	CLO5	BL3	(5 marks)

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End-Semester Assessment – April/May- 2025

Program: B.TECH. 1st Year

Semester: II

Maximum Marks: 60 marks

Time: 2.5 hrs.

Course Name: INTEGRAL CALCULUS & NUMERICAL TECHNIQUES

Course Code: UBTFY102

Course Learning Outcomes (CLOs):

1. To Demonstrate ability to solve a variety of differential equations (ordinary differential equations) using appropriate methods and techniques.
2. To utilize integration techniques for solving complex integrations.
3. To determine the area, volume of various surfaces & three dimensional objects.
4. To apply vector calculus to modernized techniques in various computing systems.
5. To implement appropriate numerical techniques to approximate solutions for differential equations, optimization problems, linear algebraic equations & interpolation methods to construct approximate functions.

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. Etc.

Q.1) Attempt any two of the following

a) Solve $(1 + xy)ydx + (1 - xy)x dy = 0$

CLO1 BTL3 5 M

b) A hot object at 200°C is placed in a room at 25°C . It cools to 120°C in 6 minutes. What is the temperature after a further interval of 6 minutes?

CLO1 BTL3 5 M

c) The charge Q on the plate of a condenser of capacity 'C' charged through a resistance R by steady voltage V satisfies the D.E.

CLO1 BTL3 5 M

$$R \frac{dQ}{dt} + \frac{Q}{C} = V. \text{ If } Q = 0 \text{ at } t = 0 \text{ then show that } Q = CV \left[1 - e^{-\frac{t}{RC}} \right]$$

Q.2) Attempt any two of the following

a) Evaluate: $\int_3^5 (x-3)^{\frac{1}{2}} (5-x)^{\frac{1}{2}} dx$

CLO2 BTL5 5 M

b) Evaluate $\int_0^{\infty} \frac{x^4}{4^x} dx$

CLO2 BTL5 5 M

c) Prove that $\int_0^{\infty} \frac{e^{-ax} - e^{-bx}}{x} dx = \log\left(\frac{b}{a}\right), a > 0, b > 0$

CLO2 BTL5 5 M

P.T.O.

Q.3) Attempt any two of the following

- a) Find the area bounded by the triangle whose vertices are $(0,0), (0,2), (1,0)$ CLO3 BTL3 5 M
- b) Evaluate $\int \int x^2 y^2 dx dy$ Over the region bounded by the curves $y^2 + x^2 = 1, y \geq 0, x \geq 0$ CLO3 BTL4 5 M
- c) Find the volume of the surface $x^2 + y^2 = 2z$ cutoff by the plane $z = 2$ CLO3 BTL3 5 M

Q.4) Attempt any two of the following

- a) Evaluate $\iint_S \nabla \times \vec{F} \cdot d\vec{S}$, where $\vec{F} = (y - z + 2)\vec{i} + (yz + 4)\vec{j} - xz\vec{k}$, Where S is the surface of the paraboloid $z = 9 - x^2 - y^2, z \geq 0$ CLO4 BTL3 5 M
- b) Evaluate $\int_C \vec{F} \cdot d\vec{r}$ for $\vec{F} = x\vec{i} + 2xy\vec{j} + z\vec{k}$ along the curve $x = 2t, y = t, z = t^2$ from $t = 0$ to $t = 1$. CLO4 BTL3 5 M
- c) Find the directional derivative of $\phi = 2xy^4 - x^2y$ at $P(2, -2, 1)$ in the direction of the line PQ where $Q(1, 1, -1)$. CLO4 BTL3 5 M

Q.5) Attempt any four of the following

- a) Find the real root of the equation $x = e^{-x}$ between $(0.5, 0.6)$ Using Bisection Method. CLO5 BTL3 5 M
- b) Estimate $f(1.5)$ using Newton's Forward Interpolation. CLO5 BTL3 5 M

X	0	1	2	3
F(X)	1	3	9	27

- c) Evaluate the integral $\int_0^3 (x + \cos x) dx$ using Simpson's 3/8th Rule for the first 7 ordinates. CLO5 BTL3 5 M
- d) Evaluate the integral $\int_0^5 (x^2 + 2x + 1) dx$ using Simpson's 1/3rd Rule with 8 subintervals. CLO5 BTL3 5 M
- e) Construct a quadratic polynomial using Lagrange's interpolation formula for the points: $(-1, 2), (0, 1), (1, 2)$. Use it to find $\int_0^4 y dx$ & y at $x = 5$. CLO5 BTL3 5 M
- f) Solve the initial value problem $\frac{dy}{dx} = xy + x^2, y(1) = 2$; Find $y(1.1)$ using Runge Kutta 4th order method with $h = 0.1$. CLO5 BTL3 5 M

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End-Semester Assessment – April/May- 2025

Program : B.Tech

Semester: II

Maximum Marks: 60 marks

Time: 2.5 hrs.

Course Name: Engineering Chemistry

Course Code: UBTFY104

Course Outcomes (CO):

1. Select appropriate electro-chemical technique and method for chemical analysis.
2. Apply the different methodologies for analysis of water and techniques involved in softening of water as commodity.
3. Identify advanced materials and select appropriate bio-fuel for engineering applications.
4. Apply the knowledge of different methods for preventing corrosion.
5. Interpret the UV and IR spectrum for material characterization.

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. etc.
- Assume suitable data if necessary
- Use of non programmable type of scientific type of calculator is allowed

Question	CO	BL	Marks
Q.1) Attempt any TWO of the following	CO1		(10 marks)
a) Explain the Conductometric titration of strong acid vs strong base with theory, procedure and titration curve.		BL1, BL2	[5 Marks]
b) Define cell constant, conductance, Galvanic Cell, Reference Electrode, Buffer solution		BL1	[5 Marks]
c) Write detailed explanation of Battery Technology		BL2	[5 Marks]
Q.2) Attempt any TWO of the following	CO2		(10 marks)
a) 75 ml of water sample required 3.7 ml of 0.025N H ₂ SO ₄ to reach the phenolphthalein end point and total 9 ml of the same acid for methyl orange end point. Calculate types and amount of alkalinities present.		BL3, BL4	[5 Marks]
b) Define Reverse osmosis of water? Justify this process with application		BL1, BL5	[5 Marks]
c) Compare the scales and sludges		BL2	[5 Marks]
Q.3) Attempt any TWO of the following	CO3		(10 marks)
a) Define doping? How conductivity of intrinsically conducting polymer can be increased using doping process? Explain with suitable example		BL1, BL2	[5 Marks]

b) Explain the structure of graphene . Give the important properties and four applications of graphene.		BL1, BL2	[5 Marks]												
c) Why hydrogen consider as future fuel. Explain the difficulties in storage and transportation of H ₂ gas.		BL1, BL2	[5 Marks]												
Q.4 Attempt any TWO of the following	CO4		(10 marks)												
a) Illustrate any five factors influencing the rate of corrosion		BL4	[5 Marks]												
b) How would you explain electroplating? Exemplify the process with a suitable diagram. Give any two applications of electroplating.		BL2, BL3	[5 Marks]												
c) How would you explain Pilling-Bedworth rule? How the P.B ratio effects on the rate of corrosion, explain with suitable example.		BL2	[5 Marks]												
Q.5) Attempt any FOUR of the following	CO5		(20 marks)												
a) Calculate possible number of fundamental vibrations modes in CO ₂ , CH ₄ , C ₆ H ₆ , NO, NH ₃		BL1	[5 Marks]												
b) State and explain Lambert's and Beer's law. State its applications and limitations.		BL1, BL2	[5 Marks]												
c) Explain different regions of Infra Red radiation		BL1, BL2	[5 Marks]												
d) Match the following IR range with functional group <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left;">IR range</th> <th style="text-align: left;">Functional group</th> </tr> </thead> <tbody> <tr> <td>1.3300 cm⁻¹</td> <td>1. Ester</td> </tr> <tr> <td>2.1730 cm⁻¹</td> <td>2. Alcohol</td> </tr> <tr> <td>3.1680 cm⁻¹</td> <td>3. Acid anhydride</td> </tr> <tr> <td>4.3100 cm⁻¹</td> <td>4. Carboxylic acid</td> </tr> <tr> <td>5.1800 cm⁻¹</td> <td>5. Amide</td> </tr> </tbody> </table>	IR range	Functional group	1.3300 cm ⁻¹	1. Ester	2.1730 cm ⁻¹	2. Alcohol	3.1680 cm ⁻¹	3. Acid anhydride	4.3100 cm ⁻¹	4. Carboxylic acid	5.1800 cm ⁻¹	5. Amide		BL1	[5 Marks]
IR range	Functional group														
1.3300 cm ⁻¹	1. Ester														
2.1730 cm ⁻¹	2. Alcohol														
3.1680 cm ⁻¹	3. Acid anhydride														
4.3100 cm ⁻¹	4. Carboxylic acid														
5.1800 cm ⁻¹	5. Amide														
e) Define the terms Chromophore, Auxochrome, Bathochromic shift, Hypsochromic shift and Hyperchromic Shift		BL1	[5 Marks]												
f) Explain different types of possible electronic transitions ($\sigma \rightarrow \sigma^*$, $\pi \rightarrow \pi^*$, $n \rightarrow \pi^*$ and $n \rightarrow \sigma^*$) that occur in a) Acetylene b) Acetone c) Aniline d) 2-methyl butane e) Benzene		BL2	[5 Marks]												

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End-Semester Assessment – Nov/Dec- 2024

Program : B.Tech

Semester: I

Course Name: Linear Algebra & Differential Calculus

Course Code: UBTFY101

Course Outcomes (CO):

1. To apply knowledge of matrix rank to solve problems in various fields, including systems of linear equations, linear transformations, and data analysis
2. To evaluate Eigenvalues and Eigenvectors and its application in image processing.
3. To employ Taylor's and Maclaurin's theorems for expanding functions into infinite series and understand continuity concepts through L'Hospital's rule.
4. To deal with partial derivatives of functions of several variables that are essential in various branches of engineering
5. To utilize partial derivatives to solve optimization problems, including finding maximum and minimum values of functions, Jacobians & error percentage

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. Etc.

Q.1) Attempt any TWO of the following

- a) Examine for the consistency of the equations, if consistent then find the solution

$$2x - 3y + 5z = 1; \quad 3x + y - z = 2; \quad x + 4y - 6z = 1$$

- b) Examine whether the following vectors are linearly dependent or independent. If dependent, find the relation between them.

$$x_1 = [1, 2, 3], x_2 = [3, -2, 1], x_3 = [1, -6, -5]$$

- c) For what values of a, b the system

$$2x + 3y + 5z = 9, 7x + 3y - 2z = 8, 2x + 3y + az = b$$

Has i) No Solution ii) Unique Solution iii) Infinite Number of Solutions

Q.2) Attempt any TWO of the following

- a) Find Eigen Values and Eigen Vector corresponding to highest

$$\text{Eigen Value for the matrix : } A = \begin{bmatrix} 1 & 1 & -2 \\ -1 & 2 & 1 \\ 0 & 1 & -1 \end{bmatrix}$$

- b) The Singular Value Decomposition of matrix $A = U\Sigma V^T$

$$\text{Hence find } U \text{ for the given matrix } A = \begin{bmatrix} 1 & 0 \\ 0 & 2 \\ 1 & 0 \end{bmatrix}$$

Question	CO	BL	Marks
Q.1) Attempt any TWO of the following	CO1	BL3	(10 marks)

[5 Marks]

[5 Marks]

[5 Marks]

Q.2) Attempt any TWO of the following	CO2	BL3	(10 marks)
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[5 Marks]

[5 Marks]

(P.T.O.)

c) Using Cayley-Hamilton theorem find A^4 and A^{-1}

$$A = \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$$

[5 Marks]

Q.3) Attempt any TWO of the following

CO3 BL2 (10 marks)

a) For $0 < a < b$, show that

$$\frac{b-a}{\sqrt{1-a^2}} < \sin^{-1} b - \sin^{-1} a < \frac{b-a}{\sqrt{1-b^2}}$$

[5 Marks]

b) Using Taylor's theorem expand $x^4 - 3x^3 + 2x^2 - x + 1$
In ascending powers of $(x - 3)$

[5 Marks]

c) Evaluate $\lim_{x \rightarrow 0} (1 + \sin x)^{\cot x}$

[5 Marks]

Q.4 Attempt any TWO of the following

CO4 BL3 (10 marks)

a) If $u = \log(\tan x + \tan y + \tan z)$ then prove that

$$\frac{1}{\sec^2 x} \frac{\partial u}{\partial x} + \frac{1}{\sec^2 y} \frac{\partial u}{\partial y} + \frac{1}{\sec^2 z} \frac{\partial u}{\partial z} = \frac{3}{\tan x + \tan y + \tan z}$$

[5 Marks]

b) If $u = \frac{x^4 + y^4}{x^2 y^2} + x^6 \tan^{-1} \frac{x^2 + y^2}{x^2 + 2xy}$ Find value of

[5 Marks]

$$x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2} \text{ At } x = 1, y = 2.$$

c) If $u = f\left(\frac{x}{y}, \frac{y}{z}, \frac{z}{x}\right)$ prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} + z \frac{\partial u}{\partial z} = 0$

[5 Marks]

Q.5) Attempt any FOUR of the following

CO5 BL3 (20 marks)

a) If $u^3 + v^3 = x + y, u^2 + v^2 = x^3 + y^3$ find $\frac{\partial(u,v)}{\partial(x,y)}$

[5 Marks]

b) Examine the functional dependence of

$$u = \sin^{-1} x + \sin^{-1} y, \quad v = x\sqrt{1-y^2} + y\sqrt{1-x^2}$$

[5 Marks]

c) If $x = uv$ and $y = \frac{u+v}{u-v}$ find $\frac{\partial(u,v)}{\partial(x,y)}$

[5 Marks]

d) Find the percentage error in the area of an ellipse when an error of 1% is made in measuring its major and minor axes. Where area of ellipse is πab .

[5 Marks]

e) Find the percentage error in computing the parallel resistance r

$$\text{of three resistances } r_1, r_2, r_3 \text{ from the formula: } \frac{1}{r} = \frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3}$$

[5 Marks]

if r_1, r_2, r_3 are in error by 2% each.

f) Examine maxima and minima of the following function and find their extreme values: $x^2 + y^2 + 6x + 12$

[5 Marks]

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End-Semester Assessment – Nov/Dec- 2024

Program : B.Tech
Maximum Marks: 60 marks

Semester: I
Time: 2.5 hrs.

Course Name: Procedural Programming

Course Code: UBTFY114

Course Outcomes (CO):

1. Explain algorithms, flowcharts and different programming constructs of C to be used for the development of applications.
2. To familiarize students with Data types and the use of Operators.
3. Illustrate the use of iterative statements and conditional Statements for solving real-world problems.
4. Demonstrate the use of all derived data types in C.
5. Develop simple C programs to illustrate the applications of Arrays, pointers, functions, and structures.

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. etc.

Question	CO	BL	Marks
Q.1) Attempt any TWO of the following	CO1		(10 marks)
a) What is an algorithm? Write an algorithm to check whether the given number is positive or negative.		BL 2,3	[5 Marks]
b) What are variables and data types in C? Explain with examples how you declare and initialize variables.		BL 2,3	[5 Marks]
c) What is type conversion in C? Explain implicit and explicit type conversion in C with examples of each.		BL 2,3	[5 Marks]
Q.2) Attempt any TWO of the following	CO2		(10 marks)
a) Explain with an example how the break statement works in a switch-case. What happens if you omit the break statement in a switch-case?		BL 3,4	[5 Marks]
b) Describe the difference between a while loop and a do-while loop with an example 'C' pseudocode of each.		BL 3,4	[5 Marks]
c) What is the goto statement in C? Explain its syntax with an example.		BL 3	[5 Marks]
Q.3) Attempt any TWO of the following	CO3		(10 Marks)
a) Write a C program to calculate the sum of elements stored at even-indexed positions in a one-dimensional array. Take input from user.		BL 3,4	[5 Marks]

<p>b) What will be the output of the following code? Justify your answer with proper steps.</p> <pre>#include <stdio.h> int main() { int arr[2][3] = {{11,22, 33}, {44, 55, 56}}; int transpose[3][2]; for (int i = 0; i < 2; i++) { for (int j = 0; j < 3; j++) { transpose[j][i] = arr[i][j]; } } printf("Transpose of the matrix:\n"); for (int i = 0; i < 3; i++) { for (int j = 0; j < 2; j++) { printf("%d ", transpose[i][j]); } printf("\n"); } return 0; }</pre>		BL 4	[5 Marks]
<p>c) What is a String and how is the String stored in memory? Write a C program to copy one string to another using strcpy(). Take input from the user.</p>		BL 2,3	[5 Marks]
<p>Q.4 Attempt any TWO of the following</p>	CO4		(10 marks)
<p>a) Define user defined functions. Explain the benefits of using functions in a program.</p>		BL 3	[5 Marks]
<p>b) Write a C program for function with no arguments and no return value for calculating average of three numbers. Accept input from the user.</p>		BL 3	[5 Marks]
<p>c) Explain in brief recursion in C programming. Write a C program to calculate the factorial of a given number using recursion.</p>		BL 3	[5 Marks]
<p>Q.5) Attempt any FOUR of the following</p>	CO5		(20 Marks)
<p>a) What is a pointer in C? Write a C program to store n elements in an array and print the elements using a pointer.</p>		BL 3	[5 Marks]
<p>b) Explain dynamic memory allocation in C.</p>		BL 2,3	[5 Marks]
<p>c) What is structure in C? How do you declare structure and use it in a C program?</p>		BL 2,3	[5 Marks]
<p>d) What is an array of structure in C? How do you declare an array of structure variables and how do you access an array of structure members with an example?</p>		BL 3	[5 Marks]
<p>e) Write a C Program to Store and Display Information of five Employees Using an Array of Structures. Accept input from the user.</p>		BL 3,4	[5 Marks]
<p>Use following fields:</p> <ul style="list-style-type: none"> ● Employee Id ● Employee Name ● Employee Salary 			
<p>f) Explain the difference between call by value and call by reference with suitable examples in C.</p>		BL 3,4	[5 Marks]