CODE: A10003	R23	H.T.No:

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

SET-1

B.Tech I Year I Semester Regular Examinations JANUARY 2025

Subject Name: Engineering Physics

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Explain constructive and destructive interferences.	2M	CO1	L1
	b	What is Super position principle?	2M	CO1	L1
	c	Define unit cell and space lattice.	2M	CO2	L1
	d	What are the types of diffraction and give the differences between them?	2M	CO2	L1
	e	What are the differences between polar and non-polar molecules?	2M	CO3	L1
	f	What is the relationship between relative permeability and magnetic susceptibility?	2M	CO3	L1
	g	State the Heisenberg uncertainty principle.	2M	CO4	L1
	h	What are the demerits of classical free electron theory?	2M	CO4	L1
	i	Define the terms: (i) drift (ii) diffusion.	2M	CO5	L1
	j	Define hall effect.	2M	CO5	L1
PART-B					
UNIT-I					
2	a	What are the necessary conditions for obtaining interference fringes?	5M	CO1	**L3**
	b	A grating has 6000 lines/cm, find the angular separation between two wave lengths of 500 nm and 510 nm in the 3^{rd} order.	5M	CO1	**L3**
OR					
3	a	Explain the theory of Fraunhofer diffraction due to ‘n’slits (Diffraction Grating)	6M	CO1	L2
	b	Find the minimum thickness of half wave plate and quarter wave plate for a light beam (λ=589.3nm) if μ_0 = 1.65833 and μ_e = 1.48640	4M	CO1	L4
UNIT-II					
4		Show that FCC is the most closely packed out of the three cubic structures by calculating the packing factors.	10M	CO2	**L2**
OR					
5	a	Describe with a suitable diagram, the powder method for the determination of crystal structure	7M	CO2	**L2**
	b	Lattice constant of copper is 0.38nm. Calculate the distance between (110) planes.	3M	CO2	**L2**
UNIT-III					
6		Explain the phenomenon of Ionic polarization and derive an expression for the Ionic polarizability.	10M	CO3	**L2**
OR					
7	a	Write a note on dielectric loss and ferro electricity	5M	CO3	**L2**

	b	A parallel plate capacitor has a plate separation of $2x10^{-3}$ m across which a potential of 10V is applied. Calculate the dielectric displacement when a material of dielectric constant 6.0 is introduced between the plates.	5M	CO3	**L2**
		UNIT-IV			
8	a	What are Matter waves? Explain their properties.	6M	CO4	**L2**
	b	Derive the expression for Debroglie wavelength.	4M	CO4	**L2**
		OR			
9	a	Explain Fermi- Dirac distribution function along with its temperature dependence.	7M	CO4	**L2**
	b	Find the temp at which there is 1% probability that a state with energy 0.5ev is above Fermi energy.	3M	CO4	**L4**
		UNIT-V			
10	a	Distinguish between direct and indirect band gap semiconductors.	6M	CO5	**L3**
	b	A current of 50A is established in a Cu slab (0.2cm thick and 2 cm wide).A magnetic field of 1.5T perpendicular to the plane of slab to the current is applied. Find the Hall voltage across the width of the slab.	4M	CO5	**L4**
		OR			
11	a	Cultivate Eistein's equation and Hall effect.	5M	CO5	**L2**
	b	Define superconductivity and mention the properties of superconductors	5M	CO5	**L2**

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CODE: A10002	**R23**	**H.T.No:**

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

SET-1

B.Tech I Year I Semester Regular Examinations December 2024

Subject Name: **Linear Algebra and Calculus**

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

		PART-A			
1	a	Find the rank of the matrix $\begin{bmatrix} 2 & -1 & 1 \\ 1 & 2 & 3 \\ 1 & 3 & 2 \end{bmatrix}$	2M	CO1	L1
	b	Explain the system of equations consistent and inconsistent.	2M	CO1	L1
	c	If $A = \begin{bmatrix} 1 & 2 \\ 0 & 6 \end{bmatrix}$ then find the Eigen values of A^3.	2M	CO2	L1
	d	Find the symmetric matrix corresponding to the quadratic form $x^2 + 2y^2 + 3z^2 + 4xy + 5yz + 6zx$	2M	CO2	L1
	e	Find the value of C in Rolle's theorem for the function $f(x) = x^3 - 3x$ in the interval $\left[0, \sqrt{3}\right]$.	2M	CO3	L1
	f	State Lagrange's mean value theorem	2M	CO3	L1
	g	If $u = x^2 + y^2$, where $x = at^2, y = 2at$, then find $\frac{du}{dt}$	2M	CO4	L1
	h	Define Chain rule for partial differentiation	2M	CO4	L1
	i	Evaluate $\int_0^{\pi} \int_0^{a\sin\theta} r\, dr\, d\theta$	2M	CO5	L1
	j	Find the value of the integral $\int_0^1 \int_0^2 \int_0^3 x^2 yz\, dxdydz$	2M	CO5	L1
		PART-B			
		UNIT-I			
2	a	Reduce the matrix $A = \begin{bmatrix} 1 & 1 & 3 & 1 \\ 1 & 2 & 0 & -1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}$ to Echelon form and hence find its rank.	5M	CO1	L1
	b	Solve completely the system of equations x+2y+3z=0, 3x+4y+4z=0, 7x+10y+12z=0.	5M	CO1	L3
		OR			
3	a	Determine b such that the system homogeneous equations $2x + y + 2z = 0;\ x + y + 3z = 0;\ 4x + 3y + bz = 0.$ has trivial and non-trivial solutions. Find the non-trivial solution	5M	CO1	L5
	b	b) Solve the system of equations $x + y - 3z + 2w = 0, 2x - y + 2z - 3w = 0,$ $3x - 2y + z - 4w = 0, -4x + y - 3z + w = 0$	5M	CO1	L3
		UNIT-II			
4	a	Find the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 2 & 0 & 1 \\ 0 & 2 & 0 \\ 1 & 0 & 2 \end{bmatrix}$	5M	CO2	L1

	b	Diagonalize the matrix A, where A= $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix}$	5M	CO2	L1
OR					
5	a	Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix} 1 & 4 & -3 \\ 0 & 3 & 1 \\ 1 & 2 & -1 \end{bmatrix}$ and hence find its inverse.	5M	CO2	L1
	b	Reduce the quadratic form $6x^2+3y^2+3z^2-4xy-2yz+zx$ to the canonical form also find rank, index, and signature of the quadratic form.	5M	CO2	L1
UNIT-III					
6	a	If the function $f(x)=x^4+ax^3+bx$ satisfies Rolle's theorem in the interval $[-1,1]$ and $f'\left(\frac{1}{2}\right)=0$, then find value of ab	5M	CO 3	L1
	b	Verify Cauchy's mean value theorem for $f(x)=\sqrt{x}$ and $g(x)=\frac{1}{\sqrt{x}}$ in $[a,b]$, where $0<a<b$.	5M	CO 3	L6
OR					
7	a	Prove that $x>0, x-\frac{x^2}{2}<\log(1+x)<x$	5M	CO3	L5
	b	Verify Maclaurin's theorem for $f(x) = (1 \quad x)^{5/2}$ with Lagrange's form remainder upto three terms in $[0,1]$	5M	CO3	L6
UNIT-IV					
8	a	If $x=r\sin\theta\cos\phi$, $y=\sin\theta\sin\phi$ and $z=r\cos\theta$, show that $J\left(\frac{x,y,z}{r,\theta,\phi}\right)=r^2\sin\theta$.	5M	CO4	L2
	b	Discuss the maxima and minima of $u(x,y)=\sin x\sin y\sin(x+y)$, where $0<x<\pi$ and $0<y<\pi$.	5M	CO4	L4
OR					
9	a	Prove that the functions $u=2x-y+3z$, $v=2x-y-z$ and $w=2x-y+z$ are functionally related and find the functionally relation between them.	5M	CO4	L5
	b	Find a point on the plane $3x+2y+z=12$, which is nearest to the origin.	5M	CO4	L1
UNIT-V					
10	a	By changing the order of integration, evaluate the integral $\int_0^a\int_x^a (x^2+y^2)\,dydx$.	5M	CO5	L5
	b	Evaluate $\int_{-1}^{1}\int_0^z\int_{x-z}^{x+z}(x+y+z)\,dxdydz$	5M	CO5	L5
OR					
11	a	Find the area of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$	5M	CO5	L1
	b	Find the volume of the sphere $x^2+y^2+z^2=a^2$ by triple integral in spherical polar coordinates.	5M	CO5	L1

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CODE: A10201 | **R23** | **H.T.No:**

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

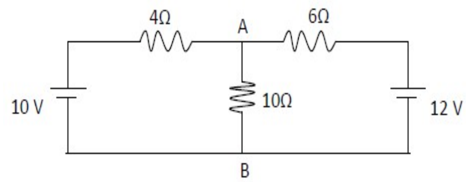
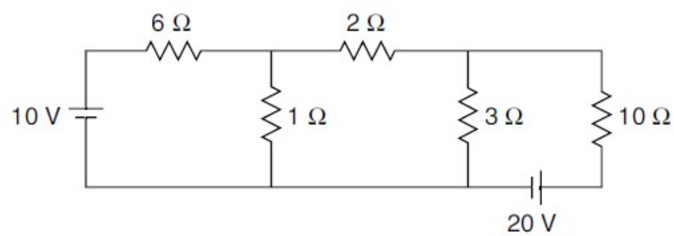
SET-1

B.Tech I Year I Semester Regular Examinations JANUARY 2025

Subject Name: **Basic Electrical & Electronics Engineering**

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Note: Part A must be answered from page no 3-19 and Part B must be answered from 20-34 pages only.

		PART-A (Electrical Engineering Part) Answer all questions, each question carries one marks			
1	a	What is Ohm's law?	1M	CO1	BTL1
	b	State superposition theorem.	1M	CO1	BTL1
	c	What is Fuse and give its importance.	1M	CO1	BTL1
	d	Define Active power .	1M	CO1	BTL1
	e	Mention few safety precautions to avoid shock.	1M	CO1	BTL1
		Answer all three units, 03 X 10 = 30 Marks			
		UNIT-I			
2	a	Determine the current flowing through the 10Ω resistor fig 1  Fig 1	5M	CO1	BTL2
	b	Find the current through the 2 Ω resistor for the network shown in Fig.2.  Fig.2	5M	CO1	BTL2
		OR			
3	a	Find the average value and rms value for the sine wave?	10M	CO2	BTL3
		UNIT-II			
4	a	Explain the how to determine unknown resistance value by using Wheat Stone Bridge.	10M	CO3	BTL1
		OR			
5	a	Explain the construction and working principle of a three phase induction motor.	10M	CO2	BTL1
		UNIT-III			
6	a	Explain Hydro–electric power plant with neat diagram?	10M	CO2	BTL1
		OR			
7	a	Explain the working principle of fuse.	5M	CO5	BTL2
	b	Calculate Monthly Electricity bill for a house having the electrical load. unit price is Rs 1.6 /- upto 100 units	5M	CO5	BTL4

		and Rs 4.5/- 101 to 200 Units and Rs.9/- 200+ units a)2 no's BLDC fans of 30W working 15 hrs/day. b)3 no's Tube light of 22W working 6 hrs/day. C) 1 no's water heater of 2kW working 1 hr/day. D)1 no's Refrigerator working E) 750W sump motor working 30 min/day F) 1.5 ton AC (1850W) working 5 hr/day			
PART-B (Electronics Engineering Part) Answer all questions, each question carries one marks					
8	a	What is Zener Diode?	1M	CO1	BTL1
	b	What are the applications of BJT?	1M	CO2	BTL2
	c	What is peak inverse voltage of a Full wave rectifier?	1M	CO2	BTL2
	d	Distinguish between combinational and sequential circuits?	1M	CO4	BTL2
	e	What is De-Morgan's law?	1M	CO3	BTL1
Answer all three units, 03 X 10 = 30 Marks					
UNIT-I					
9	a	Explain the operation of a p-n junction diode under forward and reverse bias condition.	5M	CO4	BTL2
	b	A diode is operating at 300^0 K at a forward voltage of 0.4 V carries a current of 10 mA. When the diode is changed to 0.42 V, the current becomes twice. Calculate the reverse saturation current and ideality factor (η) for the diode.	5M	CO4	BTL4
OR					
10	a	Explain the transistor operation as an amplifier.	5M	CO4	BTL2
	b	A transistor operating in CB configuration has I_C=2.98 mA, I_E=3 mA and I_{CO}=0.01 mA. What current will flow in the collector circuit of this transistor when connected in CE configuration with a base current of 30 μA.	5M	CO4	BTL4
UNIT-II					
11	a	Explain the operation of a full wave rectifier and compute the ripple factor.	5M	CO5	BTL2
	b	Explain the operation of Zener diode as a voltage regulator.	5M	CO5	BTL2
OR					
12	a	Draw and explain about Electronic Instrumentation System	5M	CO5	BTL1
	b	Explain the operation of a single stage CE amplifier and draw its frequency response.	5M	CO5	BTL2
UNIT-III					
13	a	Find the (i) Gray code for binary number 101011. (ii) BCD code for decimal number 874.	5M	CO6	BTL3
	b	Simplify the Boolean expressions (i) (A+B)(A+B')(A'+C) (ii) (ii) (X+Z)(X+XZ')+XY+Y	5M	CO6	BTL3
OR					
14	a	Design a full adder by using Universal Gates.	5M	CO6	BTL6
	b	Implement T- Flip Flop & JK Flip Flop with truth table	5M	CO6	BTL4

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CODE: A10001	R23	H.T.No:

SET-1

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN (AUTONOMOUS)

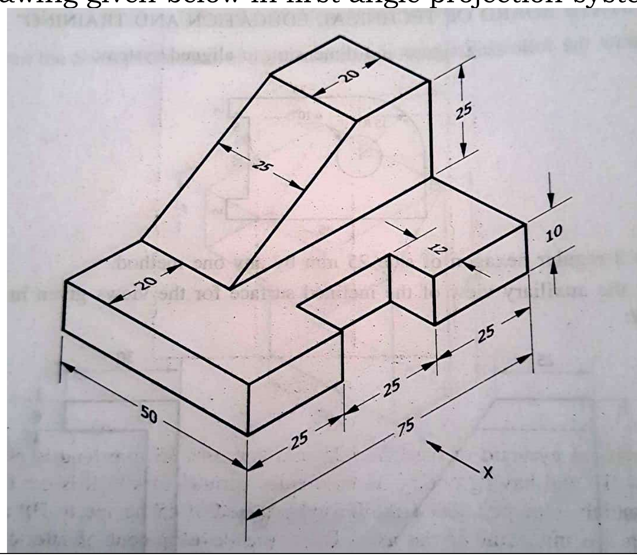
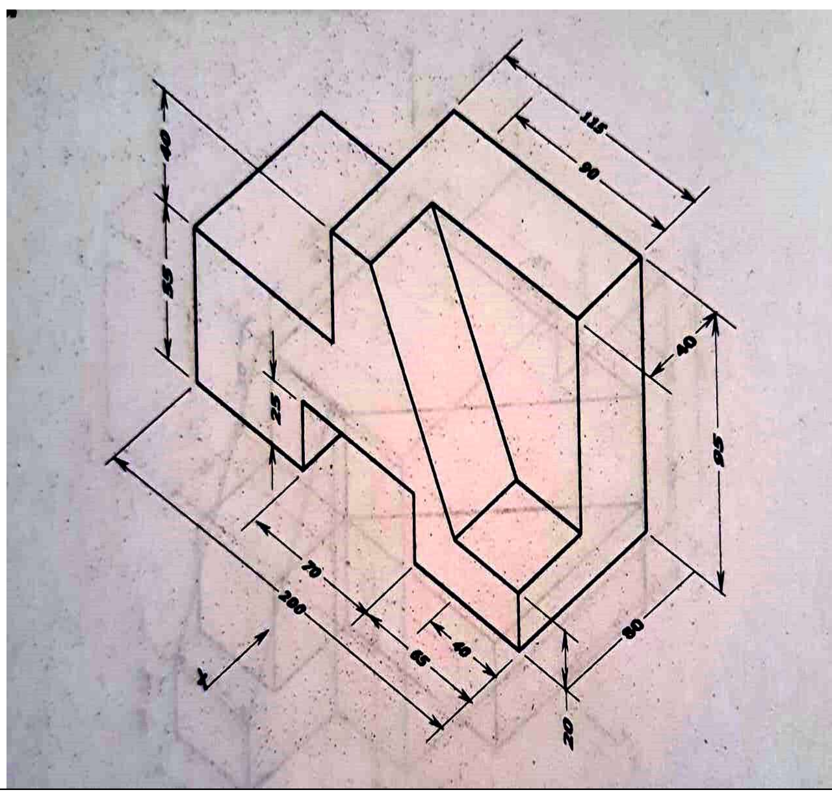
B.Tech I Year I Semester Regular Examinations JANUARY 2025

Subject Name: **Engineering Graphics**

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Instructions:
Answer one full question from each unit. Each full question carries 14 marks

		UNIT-I			
1	a	A Circle of 50mm diameter rolls along a straight line without slipping. Draw the Curve traced out by a point P on the circumference for 1 complete revolution of Circle. Draw the tangent to the curve at a point on it 35mm from the directing line.	7M	CO1	L2
	b	Construct a Rectangular Hyperbola When the distance of point 'P' is 20mm and 36mm from the asymptotes Also draw the tangent and normal to the curve at point of 25mm from the asymptote.	7M	CO1	L4
		OR			
2	a	Draw the involute of Hexagon also draw a normal and tangent to the point 120mm normal and from the centre of Hexagon.	7M	CO1	L3
	b	3) Draw an hypocycloid of a circle of diameter 50mm. which rolls inside a circle of diameter 180 mm for one revolution. Also draw a tangent and a normal to the hypocycloid at a point 50mm from the centre of directing circle	7M	CO1	L3
		UNIT-II			
3	a	The top view of a line measures 45mm. The line is Parallel to V.P and 40 ^{o} to H. P. one end of the line is on the H.P and 20mm in front of V.P .Draw the projections of a line and determine its true lengths	7M	CO2	L3
	b	The front view of a 60mm long line measures 40mm. The line is parallel to H.P and one of its ends in H.P. and 20mm. infront of V.P. Draw the projections of the line and determine its inclination with the V.P.	7M	CO2	L3
		OR			
4	a	A line CD of 75mm long is inclined 40° to the line H.P and 35° to the V.P. The end c is touches to both H.P and V.P. Draw the projections of a line.	7M	CO2	L3
	b	Make the projections of a circular plate of 60mm diameter has its surface parallel to V.P and perpendicular to H.P. The center of the circle is 40mm above H.P and 20mm infront of V.P	7M	CO2	L4
		UNIT-III			
5	a	Draw the projections of a cylinder of base diameter 40 mm and axis 70mm long is resting on the H.P on one of its base.	7M	CO3	L3
	b	A pentagonal prism of side 30 mm and axis 60mm long is resting with one of its base edges on and the axis of the prism is 45 ^{O} to the H.P. and Parallel to the V.P. construct the projections of the prism.	7M	CO3	L4
		OR			
6	a	A Square prism of base, Side 30mm and axis 60mm long is resting on H.P on one of its base edges. such that the base edge is inclined 40 ^{o} to V.P. and the axis of the prism projections is 45degrees to H.P. Draw it's projections.	7M	CO3	L3
	b	A cone of base diameter 40mm and axis 65 mm long is resting on the ground on one of its generators. The top view axis is of the cone 50° to the V.P. Draw the projections of the cone.	7M	CO3	L3
		UNIT-IV			
7	a	Construct the projections of a square prism of base Side 40 mm and axis length is 60mm is resting on H.P and it's base and the base is 35^{O} to V.P.	7M	CO4	L4
	b	A cylinder of 40mm diameter and 60mm long axis, Is resting on one of it's base on H.P. At is cut by a section plane, inclined at 60° with H.P and passing through a point on the axis at 15mm from one end. Draw the front. sectional top view and true Shape of the section.	7M	CO4	L3
		OR			

<table>
<tr><td>8</td><td>a</td><td>A pentagonal prism of base side long is resting 25 mm and axis 60mm one of it's base on H.P. with a side of base parallel to V.P. At is cut by a Section plane perpendicular to V.P and inclined at 35° to H.P. The section plane is passing through the axis of the prism at a point of 35mm from the bottom base. Draw the development of the lateral surface of the lower portion of prism.</td><td>7M</td><td>CO4</td><td>L3</td></tr>
<tr><td></td><td>b</td><td>A Square prism of base 30mm and axis 60mm long is resting with it's base on H.P, such that the base edge is parallel to V.P. Develop the complete Surfaces of the prism.</td><td>7M</td><td>CO4</td><td>L5</td></tr>
<tr><td colspan="6">UNIT-V</td></tr>
<tr><td>9</td><td>a</td><td>Draw the three orthographic views (top view, front view and side view) of the pictorial drawing given below in first angle projection system:

</td><td>14M</td><td>CO5</td><td>L3</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>10</td><td>a</td><td>Generate the front view ,top view and side view of the given object shown in fig.

</td><td>14M</td><td>CO5</td><td>L5</td></tr>
</table>

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CODE: A10501	R23	H.T.No:

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)

B.Tech I Year I Semester Regular Examinations JANUARY 2025
Subject Name: **Introduction to Programming**

Branch: CSE and ECE

SET-1

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

Instructions:
1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Define Pseudo code. Write the benefits of writing the pseudo code.	2M	CO1	BTL1
	b	What is the difference between RAM and ROM?	2M	CO1	BTL1
	c	List the various loop control statements in C. What is the use of loop controlled statements?	2M	CO2	BTL2
	d	Write the distinction between entry-controlled loops and exit-controlled loops, and provide illustrative examples for each.	2M	CO2	BTL2
	e	What is the difference between continue and break statement?	2M	CO3	BTL1
	f	Define Array. Give an example.	2M	CO2	BTL1
	g	What is Nested structure? Give an example.	2M	CO1	BTL1
	h	How do you define and initialize a structure variable in C? Provide an example.	2M	CO4	BTL2
	i	List various modes of opening a text file.	2M	CO4	BTL1
	j	Specify the standard format for defining a function.	2M	CO5	BTL2
PART-B					
UNIT-I					
2	a	Explain about various features of C language.	5M	CO1	BTL2
	b	Describe the basic organization of a computer with a neat sketch.	5M	CO1	BTL2
OR					
3	a	Draw a flow chart to find the roots of a quadratic equation.	5M	CO2	BTL3
	b	Differentiate between Top-down approach and Bottom-up approach with examples.	5M	CO1	BTL4
UNIT-II					
4	a	Write a C Program to check a number is Perfect Square or not using if-else.	5M	CO2	BTL3
	b	Explain about if, if-else, switch statements with an example.	5M	CO1	BTL4
OR					
5	a	Write a C program to find the given year is a leap year or not.	5M	CO3	BTL3

	b	Write a program to print pyramid of numbers using for loop 1 1 2 3 1 2 3 4 5 1 2 3 4 5 6 7	5M	CO3	BTL3
UNIT-III					
6	a	Develop a C program to accept N numbers and arrange them in ascending order.	5M	CO2	BTL3
	b	Write a C program to find the sum of diagonal elements of a matrix.	5M	CO2	BTL4
OR					
7	a	Discuss about any 5 string handling functions.	5M	CO3	BTL2
	b	Write a C program to find Product of two 3X3 matrices.	5M	CO3	BTL3
UNIT-IV					
8	a	Write the differences between structure and union.	5M	CO1	BTL4
	b	Write a C program to find the Sum of n numbers using pointers.	5M	CO4	BTL5
OR					
9	a	Develop a C program to find the total, average of n students using structures.	5M	CO4	BTL2
	b	Write a C Program to store information of Students using Structure.	5M	CO3	BTL3
UNIT-V					
10	a	Differentiate between call by value and call by reference.	5M	CO4	BTL4
	b	Write a C program to calculate LCM of two numbers using recursive function.	5M	CO5	BTL5
OR					
11	a	Write a C program that accepts the name of a text file from the user, opens the file, reads its contents, and displays them on the screen.	5M	CO4	BTL3
	b	Create a C program to copy content of one file into another file using command line parameters.	5M	CO4	BTL3

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