ISLAMIAH COLLEGE(AUTONOMOUS)



LAB MANUAL

ALLIED COMPUTATIONAL MATHEMATICAL PRACTICAL-II

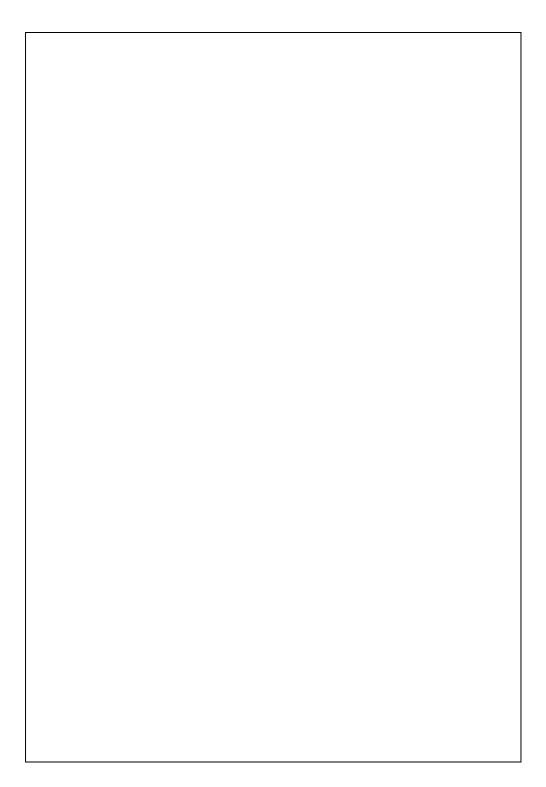
U8CCAP21

For the Candidates admitted from the academic year 2018 - 2019

By

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DEPARTMENT OF MATHEMATICS ISLAMIAH COLLEGE (AUTONOMOUS) VANIYAMBADI – 635 752



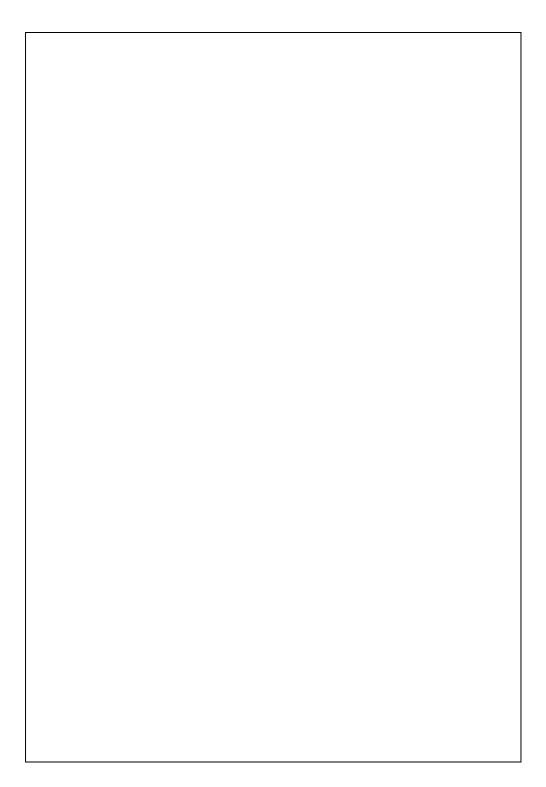
U8CCAP21

ALLIED COMPUTATIONAL MATHEMATICAL PRACTICAL - II

2 Hours / Week

List of Exercises

- 1. Matrix Manipulation
- 2. Testing Consistency of system of equations
- 3. Integration of single variable functions
- 4. Applications of integration to Area and Volume.
- 5. Plotting of 2D and 3D objects



Ex. No. 1 Matrix manipulation
Date:
(a) Create matrices of order 5×5 and 10×10 .
Command:
Output:
(b) Create 6×6 identity matrix.
Command:
Output:

(c) Compute
$$A + B$$
 and $A - B$, given $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 6 & 7 & 8 & 9 & 0 \\ 1 & 2 & -2 & 3 & 2 \\ 5 & -4 & 3 & 7 & 10 \end{bmatrix}$

and
$$B = \begin{bmatrix} 5 & 6 & 7 & 8 & 9 \\ -6 & 7 & -8 & 0 & 9 \\ -1 & 2 & -2 & -3 & 2 \\ 5 & 4 & 3 & 7 & 10 \end{bmatrix}$$
.

Command:

Output:

(d) Compute *AB*, given
$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 1 & 2 & 3 \end{bmatrix}$$
 and

$$B = \begin{bmatrix} 2 & 5 & -1 & 0 \\ -1 & 0 & 7 & 3 \\ 9 & -5 & 4 & 8 \end{bmatrix}.$$

Command:

Output:

(e) Compute
$$A^{-1}$$
, where $A = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$.

Command:

Output:

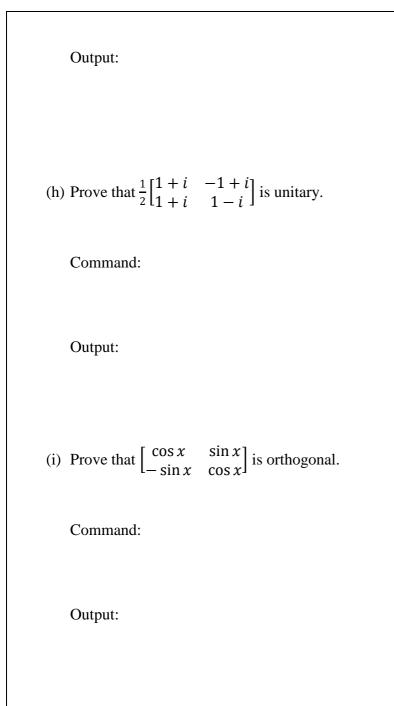
(f) Solve
$$x + y + z = 6$$
; $x + 2y + 3z = 14$; $-x + y - z = 2$, using inversion method.

Command:

Output:

(g) If
$$A = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & -1 \\ 1 & 0 & 1 \end{bmatrix}$$
, show that $A^3 - 3A^2 + 3A - 2I = 0$ and also find A^{-1} .

Command:



(j) If
$$A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 6 & 2 & 3 & 4 & 1 \\ 1 & 3 & 3 & 4 & 0 \\ 1 & 2 & 6 & 4 & 3 \end{bmatrix}$$
, then compute

- (i) Maximum of 3rd column.
- (ii) Minimum of 2nd row.
- (iii)Sum of the elements of the 1st column.
- (iv) Mean of first and fourth row.

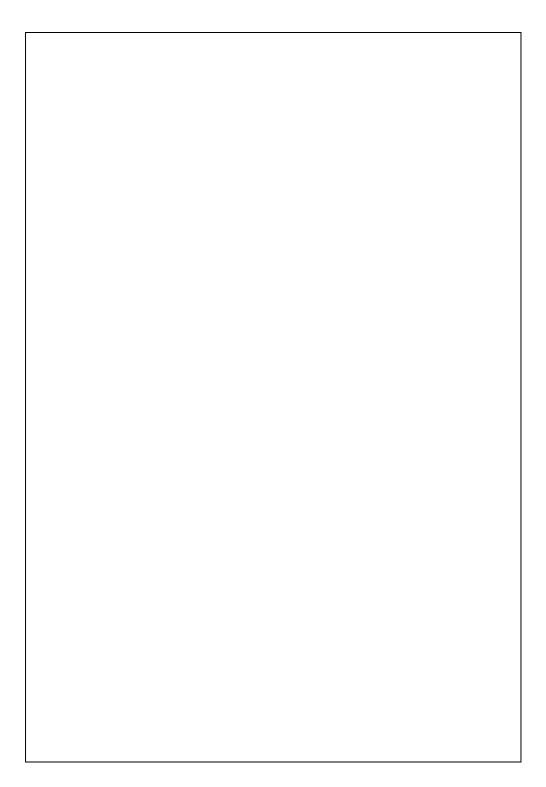
Command:

Output:

(k) If
$$A = \begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}$$
 and $B = \begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$, then compute (i) A^T , (ii) B^T , (iii) $(AB)^T$, (iv) B^TA^T , (v) $(A+B)^T$, (vi) $(A-B)^T$.

Command:

Output:



Ex. No. 2	Testing	Consistency	of system	of equations

Date:

1. Examine the consistency of the equation

$$x + y + z = 1$$
; $3x + 4y + 5z = 1$; $2x + 3y + 4z = 1$.

Command:

Output:

2. Find whether the following equations are consistent

$$x + 2y + 2z = 2;$$

 $3x - 2y - z = 5;$
 $2x - 5y + 3z = -4;$
 $x + 4y + 6z = 0$

Command:

Output:

3. Find whether the following equations are consistent

$$x + y + z = 6$$
; $x + 2y + 3z = 10$; $x + 3y + 5z = 14$

Command:
Output:
4. Ein-de
4. Examine the consistency of the equations
x + y + z = 6;
x - y + 2z = 5;
3x + y + z = 8;
2x - 2y + 3z = 7.
Command:
Output:
5. Discuss the consistency of the following system of equations.
4x + 3y + 6z = 25; $x + 5y + 7z = 13$; $2x + 9y + z = 1$
Command:
Output:

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Date:

1. Evaluate $\int \sqrt{\sin x} \, dx$.

Command:

Output:

2. Evaluate $\int (x+a)^5 dx$.

Command:

Output:

3. Evaluate $\int \left(a + \frac{bx}{c} + dx^2\right)^{\frac{1}{2}} dx.$

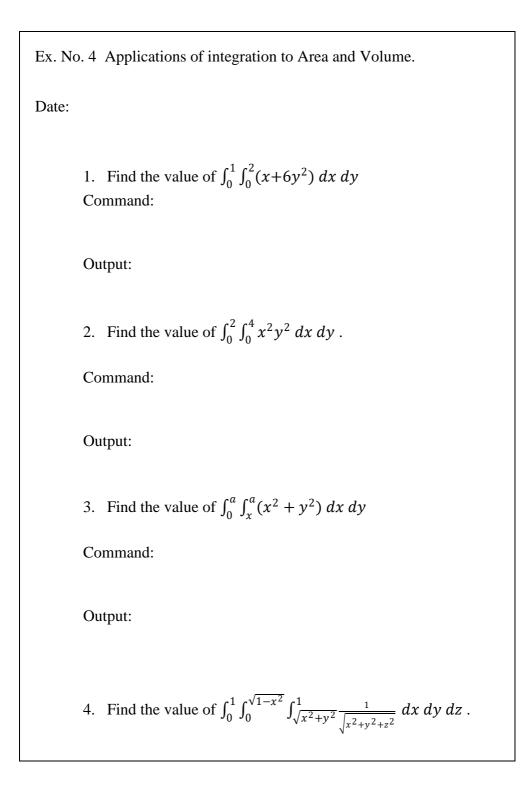
Command:

Output:

4. Evaluate.

$$\int (e^{-nx} + x^n + \cos x + \sin^{-1} x + \cosh x + 2^x) dx$$

	Command:
5.	Output: Evaluate $\int \sqrt{\sin x + \cos x} dx$ Command:
	Output:



(Command:
(Output:
5	5. Find the value of $\int_0^a \int_0^x \int_0^y xyz dx dy dz$.
(Command:
(Output:

Ex. No	o. 5 Plotting of	f 2D and	d 3D ob	jects			
Date:							
1.	Plot a graph o	of a func	etion y =	$=e^x$, wh	ere 0 ≤	$x \leq 5$.	
	Command:						
	Output:						
2.	Plot a straight	line for		_			
		<i>x</i> :	1	2	3	4	5
		y:	2	4	6	8	10
	Command:						

3. Plot a graph of the function $y = \log x$, if x = 1:1:10

Output:

Outpu	t:									
4. Plot a 2π. Comm		of tl	he fun	ection	y = sir	ı x, wh	ere x 1	canges	from -	-π t
Outpu	t:									
•										
5. Plot a										
	straig	ht lin	ne for	the fo	ollowin	ig data	7	8	9	1
5. Plot a								8	9 18	20
5. Plot a	2	2	3	4	5	6	7			
5. Plot a x $y=f(x)$	1 2 anand:	2	3	4	5	6	7			