Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD)
Re-accredited with 'A++' Grade by NAAC. Recognized by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

Continuous Internal Assessment Test I – August 2025

I SEMESTER

Class : I UG **Time: 2 hours**
Major: B.Voc AI & ML **Maximum Marks: 60**

23VAIC01 – Applied Mathematics

Course Outcomes:
CO1: Work with Matrices and construct coefficient matrix
CO2: Formulate problems in sets and apply set operations
CO3: Be familiar with fundamental notions of probability and analyze real world problems.
CO4: Construct numerical solutions for nonlinear equations.
CO5: Model grammars and languages and able to devise languages accepted by finite state automata

Part-A **6x1=6**
Choose the correct answer

1. The rows(or columns) of a determinant are said to linearly dependent if CO1K1
   a) $|A|=0$ b) $|A|\neq 0$ c) $|A|=|A^T|$ d) $|A|\neq|A^T|$

2. A^{-1} exists if and only if CO1K1
   a) A=0 b) |A|=0 c) |A|≠0 d) |A|=A

3. $(A\cup B)' = A' \cap B'$ CO1K2
   $(A\cap B)' = A' \cup B'$
   a) TT b) TF c) FT d) FF

4. A binary relation R in a set A is said to be reflexive if CO1K1
   a) $_aR_b$ b)$_aR_e$ c)$_aR_a$ d)$_bR_a$

5. The Gauss Elimination method is the …… of solving linear equation CO3K1
   a) Direct Method b) Indirect method
   c) Isolation method d) Reverse method

6. The Linear equation Y on X is expressed as Y equal to CO3K1
   a) a+bX b) a-bX c) a/bX d)a*bX

Part- B **3x6=18**
Answer ALL Questions
Each answer should not exceed 400 words or two pages

7. a. Write all the properties of determinants and prove any two properties. CO1K3
   (or)
   7 b. Find the adjacent matrix of $A=\begin{matrix}1 & 3 & 0\\ -2 & 3 & 3\\ 1 & 1 & 4\end{matrix}$ CO1K3

8. a. State and prove Demorgan's Law on sets using Venn diagram. CO1K3
   (or)
   8. b. Evaluate fog,gof when f:R ->R and g:R->R defined by f(x)=5x-1 and g(x)=Sin x. CO1K3

9. a. Write the general form of Gauss Elimination method for a 3x3 matrix. CO3K3
   (Or)
   9. b. Write the necessary and sufficient conditions to apply Gauss -Seidal method and also write its general form. CO3K3

Part-C **3x12=36**

Answer ALL questions

Each answer should not exceed 800 words or four pages

10. a. Using Cayley-Hamilton theorem find A^{-1} if $A=\begin{bmatrix}1 & 2 & 3\\ 2 & -1 & 4\\ 3 & 1 & -1\end{bmatrix}$ CO1K4

(or)

10. b. Find A^{-1} if $A=\begin{bmatrix}3 & 10 & 5\\ -2 & -3 & -4\\ 3 & 5 & 7\end{bmatrix}$ CO1K4

11. a. Define the following terms with example CO1K4

(1).Binary Relation

(2) Inverse Relation

(3) Reflexive Relation

(4) Symmetric Relation

(5 Transitive Relation

(6) Anti- Symmetric Relation

11. b. Define the following terms with example CO1K4

(1) One-one function

(2) On–to function

(3) Identity function

(4) Constant function

12. a. Solve by gauss elimination method

CO3K4

$2x+y+4z = 12$
$8x-3y+2z = 20$
$4x+11y-z = 33$

(or)

12. b. Solve by gauss seidal method

CO3K4

$8x - y + z = 18$
$2x + 5y - 2z = 3$
$x + y - 3z = -6$

No. of Copies: 60

****

Staff in-charge: Dr. V. Radha