3004N184   Candidate's Seat No : _____

M.Sc Integ in App Geo Sem-4 Examination
AGL-210
Mathematics-IV

Time : 2-00 Hours]   April 2022   [Max. Marks : 50

Instructions: All questions in **Section-I** carry equal marks.

Attempt any **Three** questions in **Section- I.**

Questions in **Section -II** is **Compulsory.**

Section-I

Q- I	(A) Find the inverse of $B = \begin{pmatrix} 2 & 2 & 0 \\ -2 & 1 & 1 \\ 3 & 0 & 1 \end{pmatrix}$.	7
	(B) Find the eigenvalues and eigenvectors of $A = \begin{pmatrix} 3 & 4 \\ -1 & 7 \end{pmatrix}$.	7

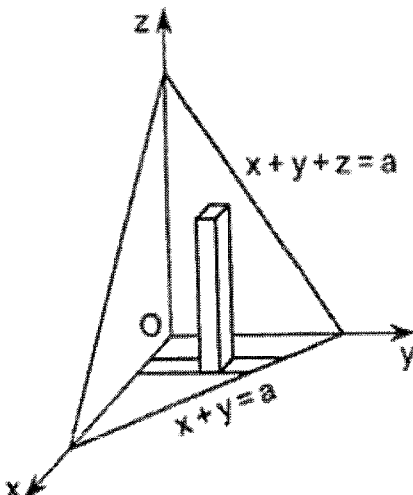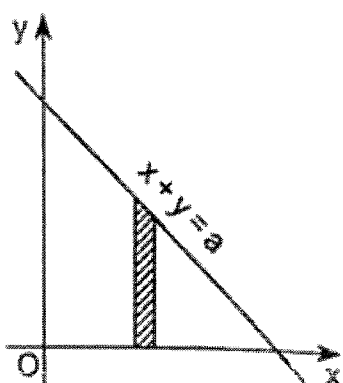|		
Q-II	(A) Find the rank of the 3×4 matrix A= $\begin{pmatrix} 1 & 1 & -1 & 3 \\ 2 & -2 & 6 & 8 \\ 3 & 5 & -7 & 8 \end{pmatrix}$.	7
	(B) Find the eigenvalues of $A = \begin{pmatrix} 9 & 1 & 1 \\ 1 & 9 & 1 \\ 1 & 1 & 9 \end{pmatrix}$.	7

Q-III	(A) Find the eigenvalues and eigenvectors of $A = \begin{pmatrix} 1 & 2 & 1 \\ 6 & -1 & 0 \\ -1 & -2 & -1 \end{pmatrix}$.	7
	(B) Find the inverse of $B = \begin{pmatrix} 3 & 4 & -1 \\ 2 & 0 & 7 \\ 1 & -3 & -2 \end{pmatrix}$.	7

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Q-IV	(A) Evaluate the determinant of A= $\begin{pmatrix} 1 & 4 & -3 \\ -5 & 2 & 6 \\ -1 & -4 & 2 \end{pmatrix}$.	7
	(B) Determine the multiplication of given two matrices $$\begin{pmatrix} 1 & 0 & 3 \\ 2 & 1 & 2 \\ 1 & 3 & 1 \end{pmatrix} \times \begin{pmatrix} 2 & 2 & 0 \\ 1 & 3 & 2 \\ 3 & 2 & 0 \end{pmatrix}$$	7
Q-V	(A) Evaluate $\int_0^1 dx \int_0^x e^{\frac{y}{x}}$	7
	(B) Evaluate $\int_0^1 \int_0^x xy\ dy\ dx$	7

Q-VI	(A) Evaluate $\int_0^1 \int_{y^2}^1 \int_0^{1-x} x\ dz\ dx\ dy$	7
	(B) Evaluate $\int_0^2 \int_1^2 \int_0^{yz} xyz\ dz\ dx\ dy$	7

Q-VII	(A) Find by double integration the area enclosed by $y^2 = x^3$ and $y = x$.	7

(B) Find the volume of the tetrahedron bounded by the planes
$x = 0, y = 0, z = 0$ and $x + y + z = a$.

7

Q-VIII	(A) Evaluate $\int_0^1 \int_1^1 \int_0^1 xyz \; dx \, dy \, dz$	7
	(B) Evaluate $\int_0^1 \int_0^1 x^2 y^2 \; dx \, dy$	7

Section II

Q-QIX	1. If $A = \begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix}$ then $|A| = $ ____ (a) 0 (b) 3 (c) -9 (d) 9	1
	2. If AB = I then B is called the _____ inverse (a) Additive (b) Multiplicative (c) Both (a) and (b) (d) none of this	1
	3. The inverse of a matrix dose not exist if the determinant of the matrix is ____ (a) 10 (b) -1 (c) 0 (d) 1	1

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