Gajendra Purohit

Legend in CSIR-UGC NET & IIT-JAM

~ Unlock Code : GPSIR ~ PhD, CSIR NET (Maths) | Youtuber(800K+165K Sub.)/Dr.Gajendra Purohit (Maths), 17+ Yr. Experience, Author

50M Watch mins | **3M** Watch mins (last 30 days) | **44K** Followers | **2K** Dedications

- **TOP EDUCATOR ON UNACADEMY FOR CSIR NET & IIT JAM**
- **YouTuber with 800K Subscribers**
- **AUTHOR OF BEST SELLER BOOK FOR CSIR NET & IIT JAM**

Get 10% Off **Referral Code : GP SIR**

FEE DETAILS FOR IIT JAM SUBSCRIPTION

No cost EMI available on 6 months & above subscription plans

24 months Save 67%	₹ 908 / mo Total ₹ 21,780	
You get 6 months extra for free		Offer expires 15 Jun 2022
✓ 12 months Save 54%	₹ 1,248 / mo Total ₹ 14,974	
You get 6 months extra for free		Offer expires 15 Jun 2022
9 months Save 45%	₹ 1,497 / mo Total ₹ 13,475	
6 months Save 25%	₹ 2,042 / mo Total ₹ 12,252	
3 months Save 17%	₹ 2,269 / mo Total ₹ 6,807	
1 month	₹ 2,723 / mo Total ₹ 2,723	

To be paid as a one-time payment

Have a referral code?

Proceed to pay

Get 10% Off

After Using My Referral Code

GPSIR

Awesome! You get 10% off

No cost EMI available on 6 months & above subscription plans

24 months Save 67%	₹ 817 / mo ~~₹ 21,780~~ ₹ 19,602	
You get 6 months extra for free		Offer expires 15 Jun 2022
✓ 12 months Save 54%	₹ 1,123 / mo ~~₹ 14,974~~ ₹ 13,477	
You get 6 months extra for free		Offer expires 15 Jun 2022
9 months Save 45%	₹ 1,348 / mo ~~₹ 13,475~~ ₹ 12,128	
6 months Save 25%	₹ 1,838 / mo ~~₹ 12,252~~ ₹ 11,027	
3 months Save 17%	₹ 2,042 / mo ~~₹ 6,807~~ ₹ 6,126	

Proceed to pay

Eigen value &eigen vector

Characteristic polynomial : Let A be square matrix of order n then $C_A(x) = \det(xI - A) = \det(A - xI)$ is a polynomial of degree n called the characteristic polynomial of A and the equation $C_A(x) = \det(A - xI) = 0$ is called characteristic equation.

Eigen value and Eigen vector : Let A be any matrix of order n then roots of characteristic equation is called eigen value.

i.e. If A is matrix and $[A - \lambda I]X = 0$ then λ is eigen value and X is eigen vector corresponding to λ

Note : Eigen vector corresponding to distinct eigen value are LI

Result : If λ is eigen value of A then

(1) Eigen value of αA is $\alpha\lambda$

(2) Eigen value of A^n is λ^n.

(3) Sum of all eigen value = Trace (A)

(4) Product of all eigen value = det(A)

(5) Eigen value of A^{-1} is λ^{-1}.

(6) Eigen value of Adj(A) is $\frac{|A|}{\lambda}$

(7) If sum of each row in A is equal to k then k must be eigen value and it is largest eigen value.

Q.1. Let A be a 3×3 matrix with eigen value 1, -1, 0. Then the determinant of $I + A^{100}$ is

(a) 6 (b) 4

(c) 9 (d) 100

Q.2. Let $A=\begin{pmatrix} 2 & -1 & 3 \\ 2 & -1 & 3 \\ 3 & 2 & -1 \end{pmatrix}$. Then the largest eigenvalue of A is

(a) 1 (b) 2

(c) 3 (d) 4

Eigen value for different type of matrix

(1) Eigen values of symmetric matrix and hermitian matrix are real.

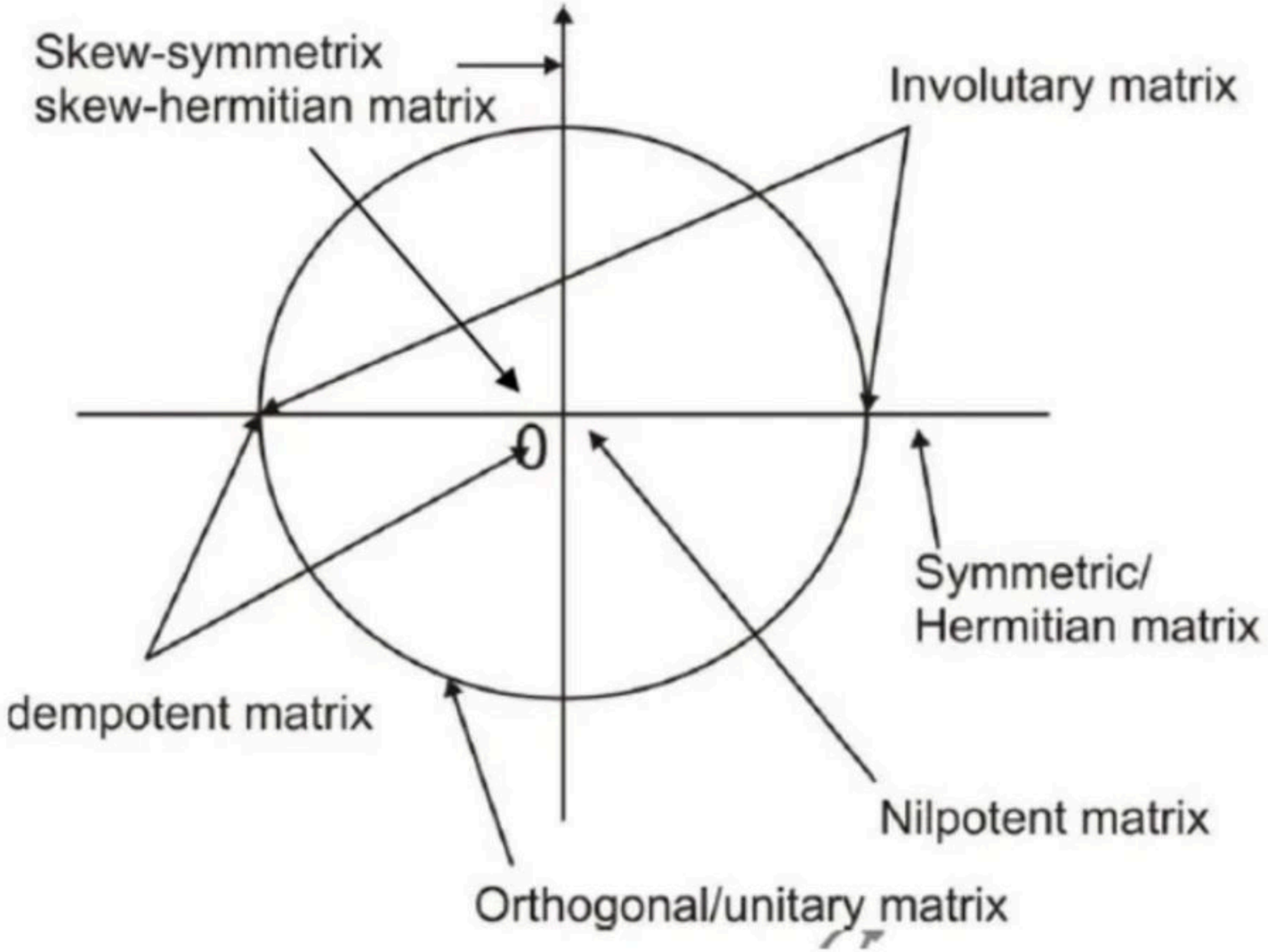
(2) Eigen value of skew-symmetric and skew-hermitian matrix are either zero or purely imaginary.

(3) Eigen values of involutory matrix are either 1 or -1 or both.

(4) Eigen values of idempotent matrix are either 0 or 1 or both.

(5) Eigen values of nilpotent matrix are 0.

(6) Eigen values of orthogonal matrix and unitary matrix are unit modulus.



(7) Eigen value of permutation matrix.

Let $\sigma = c_1.c_2. \ldots . c_k$ product of disjoint cycles such that $l(c_i) = r_i$ where $l(c_i)$ = length of c_i.

Then characteristic of A is $c(x) = \prod_{ri}(x^{r_i} - 1)$

i.e. $\sigma = (12)\,(3) \in S_3$

$c_1 = (12)$ and $l(c_1) = 2 = r_1$

$c_2 = (3)$ and $l(c_2) = 1 = r_2$ then $c(x) = (x^2 - 1)(x - 1)$

COMPLETE COURSE ON

MATHEMATICS

FOR IIT-JAM 2022

TOPICS TO BE COVERED

- REAL ANALYSIS
- FUNCTION OF ONE & TWO VARIABLE
- LINAER ALGEBRA
- MODERN ALGEBRA

TOPICS TO BE COVERED

- SEQUENCE & SERIES
- INTEGRAL CALCULUS
- VECTOR CALCULUS
- DIFFERENTIAL EQUATION

FEE DETAILS FOR IIT JAM SUBSCRIPTION

No cost EMI available on 6 months & above subscription plans

24 months Save 67%	₹ 908 / mo Total ₹ 21,780	
You get 6 months extra for free		Offer expires 15 Jun 2022
✓ 12 months Save 54%	₹ 1,248 / mo Total ₹ 14,974	
You get 6 months extra for free		Offer expires 15 Jun 2022
9 months Save 45%	₹ 1,497 / mo Total ₹ 13,475	
6 months Save 25%	₹ 2,042 / mo Total ₹ 12,252	
3 months Save 17%	₹ 2,269 / mo Total ₹ 6,807	
1 month	₹ 2,723 / mo Total ₹ 2,723	

To be paid as a one-time payment

Have a referral code?

Proceed to pay

Get 10% Off

After Using My Referral Code

GPSIR

Awesome! You get 10% off

No cost EMI available on 6 months & above subscription plans

24 months Save 67%	₹ 817 / mo ~~₹ 21,780~~ ₹ 19,602	
You get 6 months extra for free		Offer expires 15 Jun 2022
✓ 12 months Save 54%	₹ 1,123 / mo ~~₹ 14,974~~ ₹ 13,477	
You get 6 months extra for free		Offer expires 15 Jun 2022
9 months Save 45%	₹ 1,348 / mo ~~₹ 13,475~~ ₹ 12,128	
6 months Save 25%	₹ 1,838 / mo ~~₹ 12,252~~ ₹ 11,027	
3 months Save 17%	₹ 2,042 / mo ~~₹ 6,807~~ ₹ 6,126	

Proceed to pay

FOUNDATION COURSE OF

MATHEMATICS

FOR CSIR-NET

Q.3. Which of the following properties are true?

(a) If λ is an eigen value of A then 2λ is an eigen value of A^{-1}.

(b) If λ is an eigen value of A then $1/\lambda$ is an eigen value of A^{-1}.

(c) If λ is an eigen value of an orthogonal matrix, then $1/\lambda$ is also its eigen value.

(d) All of the above.

Q.4. The square matrix A is said to be an idempotent if $A^2 = A$.

An idempotent matrix is non-singular iff

(a) All E.V. are real

(b) All E.V. are real non-negative

(c) All E.V. are either 0 or 1

(d) All E.V. are 1

Q.5 The trace of the matrix $A = \begin{bmatrix} 3 & 2 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}^{15}$ is

(a) $1 + 3^{15}$

(b) $2 + 3^{15}$

(c) 3^{15}

(d) 0

Q.6. Let A be 3×3 matrix with real entries such that 1, -1, 2 are its eigenvalues if $B = A^3 + 2A^2 + I$, then

(a) det (B) = 50 (b) det (B) = 136

(c) det (B) = 23 (d) det(B) = 17

Q.7.. Let A and B be n × n real matrices and let $C = \begin{pmatrix} A & B \\ B & A \end{pmatrix}$

.Which of the following statements are true?

(a) If λ is an eigenvalue of A + B then λ is an eigen value of C

(b) If λ is an eigenvalue of A – B then λ is an eigen value of C

(c) If λ is an eigen value of A or B then λ is an eigen value of C

(d) All eigen values of C are real

Q.8. Which of the following eigen values of the matrix.

$$\begin{bmatrix} 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 \end{bmatrix}$$

(a) 1 (b) -1

(c) i (d) –i

Q.1. Let $M_n(R)$ be the set of $n \times n$ matrices with real entries.

Which of the following is true?

(a) Any matrix $A \in M_4(R)$ has a real eigen value.

(b) Any matrix $A \in M_5(R)$ has a real eigen value.

(c) Any matrix $A \in M_2(R)$ has a real eigen value

(d) None of these

unacademy CSIR-UGC NET Search Login

Educator Profile

Gajendra Purohit

#5 Educator in CSIR-UGC NET

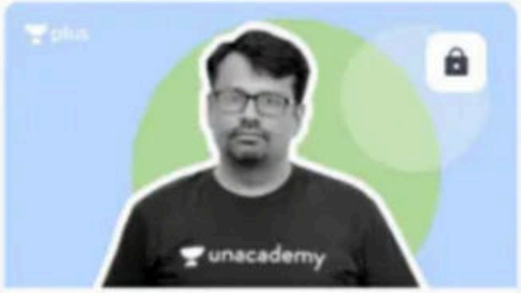
Dr.Gajendra Purohit PhD, CSIR NET (Maths) | Youtuber(330K+30k Sub.)/Dr.Gajendra Purohit (Maths), 17+ Yr. Experience, Author of Bestseller

Follow

11M Watch mins | **1M** Watch mins (last 30 days) | **22k** Followers | **1k** Dedications

CSIR-UGC NET

SEE ALL



HINDI MATHEMATICAL SCIENCES

Course on Linear Algebra, Partial Diff. Equation & Calculus

Starts on Mar 1, 2021 • 24 lessons

Gajendra Purohit

HINDI MATHEMATICAL SCIENCES

Course on Complex Analysis & Integral Equation

Starts on Jan 14, 2021 • 16 lessons

Gajendra Purohit

HINDI MATHEMATICAL SCIENCES

Foundation Course on Mathematics for CSIR 2021

Starts on Dec 7, 2020 • 20 lessons

Gajendra Purohit

Educator highlights

- Works at **Pacific Science College**
- Studied at **M.Sc., NET, PhD(Algebra), MBA(Finance), BEd**
- PhD, NET | Plus Educator For CSIR NET | Youtuber (260K+Subs.) | Director Pacific Science College |
- Lives in **Udaipur, Rajasthan, India**
- Unacademy Educator since

FEE DETAILS FOR IIT JAM SUBSCRIPTION

No cost EMI available on 6 months & above subscription plans

24 months Save 67%	₹ 908 / mo Total ₹ 21,780	
You get 6 months extra for free		Offer expires 15 Jun 2022
✓ 12 months Save 54%	₹ 1,248 / mo Total ₹ 14,974	
You get 6 months extra for free		Offer expires 15 Jun 2022
9 months Save 45%	₹ 1,497 / mo Total ₹ 13,475	
6 months Save 25%	₹ 2,042 / mo Total ₹ 12,252	
3 months Save 17%	₹ 2,269 / mo Total ₹ 6,807	
1 month	₹ 2,723 / mo Total ₹ 2,723	

To be paid as a one-time payment

Have a referral code?

Proceed to pay

Get 10% Off

After Using My Referral Code

GPSIR

Awesome! You get 10% off

No cost EMI available on 6 months & above subscription plans

24 months Save 67%	₹ 817 / mo ~~₹ 21,780~~ ₹ 19,602	
You get 6 months extra for free		Offer expires 15 Jun 2022
✓ 12 months Save 54%	₹ 1,123 / mo ~~₹ 14,974~~ ₹ 13,477	
You get 6 months extra for free		Offer expires 15 Jun 2022
9 months Save 45%	₹ 1,348 / mo ~~₹ 13,475~~ ₹ 12,128	
6 months Save 25%	₹ 1,838 / mo ~~₹ 12,252~~ ₹ 11,027	
3 months Save 17%	₹ 2,042 / mo ~~₹ 6,807~~ ₹ 6,126	

Proceed to pay

THANK YOU VERY MUCH EVERYONE

GET THE UNACADEMY PLUS SUBSCRIPTION SOON.

TO GET 10% DISCOUNT IN TOTAL SUBSCRIPTION AMOUNT

USE REFERRAL CODE: GPSIR