

CSIR NET/GATE/JEST Guidance Manual

Complete Books, Notes and Videos
Recommendations



PhysicsByAaryan

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(JAM| JEST| GATE| NET| CENTRAL UNIVERSITIES)

Mob:9501976811; Join telegram: physics by aaryan; website: physicsbyaaryan.com

CSIR NET/Gate/JEST/TIFR PHYSICS GUIDANCE

Complete Guidance Manual for your Preparation of CSIR NET Physics

Red Mark: Important topics

Green Mark: Less Important

Subject 1: Mathematical Physics

1. *Vector Algebra and Vector Calculus

- a. DJ Griffiths: For Electromagnetism: Ch1 Full (only leave topic how vectors transform)
- b. Solve all problems of chapter
- c. Hand Written Short Notes of "PhysicsByAaryan"
- d. Assignment

Useful Video Lectures:

<https://www.youtube.com/watch?v=FfJtVvQtqTM&list=PLU6SqdYcYsfJz9FAzbgocIjIkw4NXAar>

Entire playlist is very useful

2. * Linear Algebra and Matrices

- a. Only Short Notes of "PhysicsByAaryan"
- b. Weekly assignment of "PhysicsByAaryan"
- c. No book reading needed. Follow Video Lectures thoroughly.
- d. Assignment

Useful Video Lecture:

https://www.youtube.com/watch?v=MS_5h6CzIc&list=PLq-Gm0yRYwThkIRVGuMC01GI7m1YSv_qn&index=5

Lecture 5-12 will help you. These lectures will also lay good



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3. *Differential Equations

- a. Book: Higher engineering mathematics/mathematical physics by Hk Das
Ch3 Topics: 3.1-3.12 (equations reducible to any form, these topics are not important). Solve only examples of this book. Avoid Exercises.
- b. Topics: 3.16-3.17 (These Solved examples of physics systems is very important for TIFR and JEST) Only do Solved examples.
- c. Topics: 3.18-3.28 (Don't prove any formula, all formulae must be memorized and practiced well with solved examples)
- d. Short Notes by PhysicsByAaryan
- e. Previous year questions module by PhysicsbyAaryan
- f. Assignment

Video recommendation:

<https://www.youtube.com/watch?v=Im242eBqaxw&list=PLbRMhDVUMngeVrxtbBz-n8HvP8KAWBpl5&index=52>

Lecture 5-60 are useful. Watch this at fast forward if you don't understand book.

4. *Fourier Series

- a. Book: HK DAS: CH12 Full (IT is not very important topic for GATE and NET aspirants)
- b. Short Notes by "Physics by Aaryan"
- c. Previous year questions module by "PhysicsByAaryan"
- d. Assignment

Useful Video Lecture:

<https://www.youtube.com/watch?v=NdouX5-KD6Y&list=PLU6SqDYcYsfIXJT49bVTz4KjqHD5fGQY8>

5. *Laplace Transform

- a. Book: HK Das: Ch13 (13.1-13.9 Full with examples) Try to prove all the properties because properties are hard to memorise, you must know how to derive them in 10seconds in exam. Topics after 13.9 are inverse laplace transforms which are not very important. So leave them.
- b. Short Notes by "Physics by Aaryan"
- c. Previous year questions module by "PhysicsByAaryan"
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Useful lectures:

<https://www.youtube.com/watch?v=JzaaQxkL6Ak>

lecture 23-38. Lectures are exactly matching with level of book hk das.

6. *Fourier Transform:

- a. Book: HK Das: Ch14: 14.6-14.14 (Solve all examples and proof of formulae)
- b. Short Notes by "PhysicsByAaryan"
- c. Previous year questions module by "PhysicsByAaryan"
- d. Assignment

Useful lectures:

<https://www.youtube.com/watch?v=HDgzve0w0NQ>

Lecture 55-57

7. *Special Functions

- a. Start by knowing differential equations with non-constant coefficients. Ordinary and singular points. Do Hermite, Legendre and Bessel equation only. Remember equations, generating functions, Polynomial general formula, First few polynomials and their graphs. Recurrence relations can be avoided.
- b. Hand written notes of PhysicsByAaryan
- c. PYQ solution of PhysicsByAaryan.
- d. Solve assignment (given to you in self study course)

Read book: HK DAS (only do above mentioned things from book)

No video lecture needed. Memorize above mentioned topics very well.



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8. *Complex Analysis

a. Book: Erwn Kryseig: 3 chapters : Ch13 complex numbers and functions

Ch 14 complex integration

Ch 16 Laurent series, Residual integration.

- b. PYQ solutions by PhysicsByAaryan
- c. Short notes by PhysicsByAaryan
- d. Assignment(given to you in self study course)

Video Lectures

https://www.youtube.com/watch?v=b5VUnapu-qs&list=PLbMVogVj5nJRhl_6TUGChpnt2Lg0AZvZu&index=1

Focus on these lectures very well. Must watch lectures. Lecture 1-6

9. *Probability

- a. See Stat Mech Section
- b. PYQ solutions by PhysicsByAaryan
- c. Short notes by PhysicsByAaryan
- d. Assignment(given to you in self study course)

10. *Advanced Topics (Greens Function, Tensors, Partial Differential Eqns)

- a. Only PhysicsByAaryan Notes
- b. PYQ solutions by PhysicsByAaryan
- c. Short notes by PhysicsByAaryan
- d. Assignment(given to you in self study course)



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Subject 2: Classical Mechanics

1. *Basic Mechanics

Topic: Newton Laws, Collisions, Friction, Work Power and Energy.

- a. HC Verma (Read only selective topics mentioned above)
- b. Don't waste much time on this. Just for brush up.
- c. JC Upadhay: Ch1

2. *Lagrangian Mechanics

- a. JC Upadhay: Ch 2 (Must solve all examples)
- b. Physics by Aaryan Short Notes(Best Notes you will find anywhere)
- c. Lagrangian Mechanics PYQ solution of Physics by Aaryan
- d. Test of Physics by Aaryan
- e. Assignment of Physics by Aaryan

3. * Central Forces:

- a. JC Upadhay: CH 4 Full (Must solve all examples)
- b. Physics by Aaryan Short Notes(Best Notes you will find anywhere)
- c. PYQ solution of Physics by Aaryan
- d. Test of Physics by Aaryan
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4. * Pseudo Forces:

- a. JC Upadhay: CH 11 Full (Must solve all examples)
- b. Physics by Aaryan Short Notes(Best Notes you will find anywhere)
- c. PYQ solution of Physics by Aaryan
- d. Test of Physics by Aaryan
- e. Assignment of Physics by Aaryan

5. * Rotational Motion and Moment of Inertia

- a. Hc Verma: CH10-11 with examples
- b. Physics by Aaryan for selected advanced topics
- c. PYQ solution of Physics by Aaryan
- d. Test of Physics by Aaryan
- e. Assignment of Physics by Aaryan

6. * Hamiltonian Mechanics:

- a. JC Upadhay: CH 3 Full (Must solve all examples)
- b. Physics by Aaryan Short Notes (Best Notes you will find anywhere)
- c. PYQ solution of Physics by Aaryan
- d. Test of Physics by Aaryan
- e. Assignment of Physics by Aaryan

7. * Small Oscillations:

- a. JC Upadhay: CH 9 (Must solve all examples)
- b. Physics by Aaryan Short Notes (Best Notes you will find anywhere)
- c. PYQ solution of Physics by Aaryan
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8. * Poisson Brackets, Canonical Transformations and other

- a. Physics by Aaryan Short Notes (Best Notes you will find anywhere)
- b. Physics by Aaryan Short Notes (Best Notes you will find anywhere)
- c. PYQ solution of Physics by Aaryan
- d. Test of Physics by Aaryan
- e. Assignment of Physics by Aaryan

9. * Special Theory of Relativity

- a. RB Singh : Modern Physics: CH 1
- b. Physics by Aaryan Short Notes (Best Notes you will find anywhere)
- c. PYQ solution of Physics by Aaryan
- d. Test of Physics by Aaryan
- e. Assignment of Physics by Aaryan

NPTEL Course Recommendation

<https://www.youtube.com/watch?v=c10eRk9aUBs&list=PLq-Gm0yRYwTjpY9BIDxFGNXIaQJIOQRdo&index=44>

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<https://www.youtube.com/watch?v=c10eRk9aUBs&list=PLq-Gm0yRYwTjpY9BIDxFGNXIaQJIOQRdo&index=44>

Watch Videos selectively only when you don't understand notes/book



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Subject 3: Electromagnetism

1. Electrostatics

- a. *DJ Griffiths: Chapter 2 Complete
- b. *DJ Griffiths: Chapter 3 Topic No. 3.1, 3.2, 3,4
- c. *DJ Griffiths: Chapter 4 Complete
- d. Physics by Aaryan: Short Notes
- e. Previous Year Questions
- f. Assignment

2. Magnetostatics

- a. *DJ Griffiths: Chapter 5 Complete
- b. *DJ Griffiths: Chapter 6 Topic No. 6.2,6.3,6.4.1
- c. Physics by Aaryan: Short Notes
- d. Previous Year Questions
- e. Assignment

3. Electrodynamics

- a. *DJ Griffiths: Chapter 7 Complete
- b. *DJ Griffiths: Chapter 8 Topic No. 8.1
- c. *DJ Griffiths: Chapter 9 Complete
- d. Physics by Aaryan: Short Notes
- e. Previous Year Questions
- f. Assignment

4. Potentials and Radiations

- a. *DJ Griffiths: Chapter 10 Topic No. 10.1
- b. *DJ Griffiths: Chapter 11 Topic No. 11.1,11.2.1
- c. Physics by Aaryan: Short Notes
- d. Previous Year Questions
- e. Assignment



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5. Relativistic Electrodynamics

- a. *DJ Griffiths: Chapter 12 Topic No. 12.3.1,12.3.2
- b. Physics by Aaryan: Short Notes
- c. Previous Year Questions
- d. Assignment

6. Wave Optics

- a. *Subramaniam Optics: Chapter on Interference, Diffractions, Polarization
- b. Physics by Aaryan: Short Notes
- c. Previous Year Questions
- d. Assignment

Useful Video Lectures:

https://www.youtube.com/watch?v=yzgGHAoN_68&list=PLyqSpQzTE6M_OXWtn1RUnuZNSbSSy6Lys&index=1

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Subject 4: Quantum Mechanics

1. *Basics of Quantum Mechanics

- a. Zetli: Ch 2 and 3 Complete with all examples
- b. PhysicsbyAaryan Short Notes
- c. Assignment
- d. Previous Year Questions

2. *Quantum Mechanics in 1D

- a. Griffiths: Ch 1 and 2 Complete with all problems
- b. PhysicsbyAaryan Short Notes
- c. Assignment
- d. Previous Year Questions

3. *Angular Momentum

- a. Zetli: Ch 5 Complete with all problems
- b. PhysicsbyAaryan Short Notes
- c. Assignment
- d. Previous Year Questions

4. *Quantum Mechanics in 3D

- a. Zetli: Ch 6 Complete with all problems
- b. PhysicsbyAaryan Short Notes
- c. Assignment
- d. Previous Year Questions



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5. *Approximate Methods in QM

- a. Zetli: Ch 9 Complete with all problems
- b. PhysicsbyAaryan Short Notes
- c. Assignment
- d. Previous Year Questions

6. *Scattering Theory

- a. Zetli: Ch 11 complete with all problems
- b. PhysicsbyAaryan Short Notes
- c. Assignment
- d. Previous Year Questions

7. *Extra Topics

- a. Zetli: Appendix 1 : Dirac Delta Function

Recommended Online Course

<https://www.youtube.com/watch?v=TcmGYe39XG0&list=PL0F530F3BAF8C6FC>

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Subject 5: Thermodynamics and Statistical Mechanics

1. *Thermodynamics and Kinetic Theory

- a. Only PhysicsbyAaryan Short Notes
- b. Assignment
- c. Previous Year Questions(also do for JAM and JEST) (MUST)

2. *Random Walk and Probability

- a. BB Laud: Ch 2 in detail
- b. PhysicsbyAaryan Short Notes
- c. Assignment
- d. Previous Year Questions

3. *Phase Space, Micro and Macro States

- a. Only PhysicsbyAaryan Notes
- b. Assignment
- c. Previous Year Questions (also do for JAM) (MUST)

4. *Microcanonical Ensemble

- a. Patharia: Ch 1 and 2
- b. PhysicsbyAaryan Notes
- c. Assignment
- d. Previous Year Questions

5. *Canonical Ensemble

- a. Patharia: Ch 3
- b. PhysicsbyAaryan Notes
- c. Assignment
- d. Previous Year Questions



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6. *Grand Canonical Ensemble

Never Do grand Canonical ensemble. Only definition of grand canonical distribution is enough.

7. *Quantum Statistics

- a. BB Laud : Chapter 8-10 Full
- b. PhysicsByAaryan (Even only notes are enough)
- c. Assignment
- d. Previous Year Questions

8. *Phase Transitions

- a. BB Laud: Ch 11 Full
- b. PhysicsByAaryan (Even only notes are enough)
- c. Assignment
- d. Previous Year Questions (also do jam PYQ)

9. *Ising Model

- a. Only PhysicsByAaryan Notes
- b. Assignment
- c. Previous Year Questions (also do jam PYQ)

Recommended Online Course

<https://www.youtube.com/watch?v=8xRFqrNyJCg&list=PLyqSpQzTE6M9iXvWVCo-pr67kKt61ntzll>



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Subject 6: Electronics

1. *Semiconductor Physics

- a. Donald A Naeman : Semiconductor Physics and diodes: Ch 3 and 4
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year questions

2. *Diodes and Applications

- a. VK Mehta: Ch 5 and 6
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year questions

3. *Transistors

- a. VK Mehta: Ch 8 and 9
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year questions

4. *OP AMP

- a. VK Mehta: Ch 25
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year questions



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5. *Amplifiers and Oscillators

- a. Only PhysicsByAaryan Notes
- b. Assignment
- c. Previous year questions

6. *Digital Electronics, Data Analysis and Errors

Topics are very wide and scattered. No one book contains everything and there is a lot of extra things if you study particular digital electronics book. Reference book is Anand Kumar.

Follow only PhysicsByAaryan Notes

- a. PhysicsByAaryan Notes(Golden Notes which is available nowhere else)
- b. Assignment
- c. Previous year questions

Recommended Channel: All About Electronics

Physics By Aaryan



Subject 7: Solid State Physics

1. *Crystal Structure, Xray Diffraction and Reciprocal Lattice

- Puri and Babbar: Ch 1-2 Full
- PhysicsByAaryan Note
- Assignment
- Previous Year Questions

2. *Bonding in Solids

- Puri and Babbar: Ch 3 Full
- PhysicsByAaryan Note
- Assignment
- Previous Year Questions

3. *Lattice Vibrations and Thermal Properties of Solids

- Puri and Babbar: Ch 4-6 Full
- PhysicsByAaryan Note
- Assignment
- Previous Year Questions

4. *Electronic Properties of Solids

- Puri and Babbar: Ch 7 Full
- Donald A Naeman : Semiconductor Physics and diodes: Ch 3 and 4
- Read About Mobility and Hall Effect in Naeman Ch 5
- PhysicsByAaryan Note
- Assignment
- Previous Year Questions



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5. *Magnetism in Solids

- a. Puri and Babbar: CH 8
- b. PhysicsByAaryan Note
- c. Assignment
- d. Previous Year Questions

6. *Superconductivity

- a. Puri and Babbar: CH 10
- b. PhysicsByAaryan Note
- c. Assignment
- d. Previous Year Questions

Recommended Videos:

<https://www.youtube.com/watch?v=Ofzd2ZqFvjo&list=PLADLRin7kNjG1Dlna9MDA53CMKFHPSi9m>

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Subject 8: Atomic and Molecular Physics

1. *Models of Hydrogen like Atoms

- a. Rajkumar: Ch 2,4,5
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year Questions

2. *Phenomenon in Atomic Physics (LS, JJ-Coupling, Zeeman, Stark Effect etc)

- a. Rajkumar: Ch 9, 12, 13
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year Questions

3. *Xray Spectra and Line Width

- a. Rajkumar: Ch15,16
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year Questions

4. Molecular Physics

- a. *Rajkumar: Ch 18,19,20
- b. *Rajkumar: Ch 21
- c. PhysicsByAaryan Notes
- d. Assignment
- e. Previous year Questions



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5. *Laser Physics

- a. Rajkumar: Ch 31,32
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year Questions

Recommended Lectures:

<https://www.youtube.com/watch?v=SCmtEhGVhSM&list=PLXHedl-xbyr9VGhbnhw3fN9YyiH14oJCD>

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Subject 9: Nuclear and Particle Physics

1. *Basic Properties of Nucleus

- a. Mittal and Verma : Ch 1 Full
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year Questions

2. *Deuteron Problem and Nuclear Force

- a. Only PhysicsByAaryan Notes
- b. Assignment
- c. Previous year Questions

3. *Radioactivity

- a. Mittal and Verma : Ch 3-4 Full
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year Questions

4. *Nuclear Models

- a. Mittal and Verma : Ch 2 Full
- b. KS Krane: Topic 5.2
- c. PhysicsByAaryan Notes
- d. Assignment
- e. Previous year Questions



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5. *Particle Physics

- a. Mittal and Verma : Ch 8 Full
- b. PhysicsByAaryan Notes
- c. Assignment
- d. Previous year Questions

6. *Extra

Read about GM Tube Detector, Cyclotron accelerator and LINAC Accelerator from Mittal and Verma

Recommended Lectures:

<https://www.youtube.com/watch?v=josqicH79PE&list=PLbMVogVj5nJRvq-w3zway7k3GzmUDte3a>

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