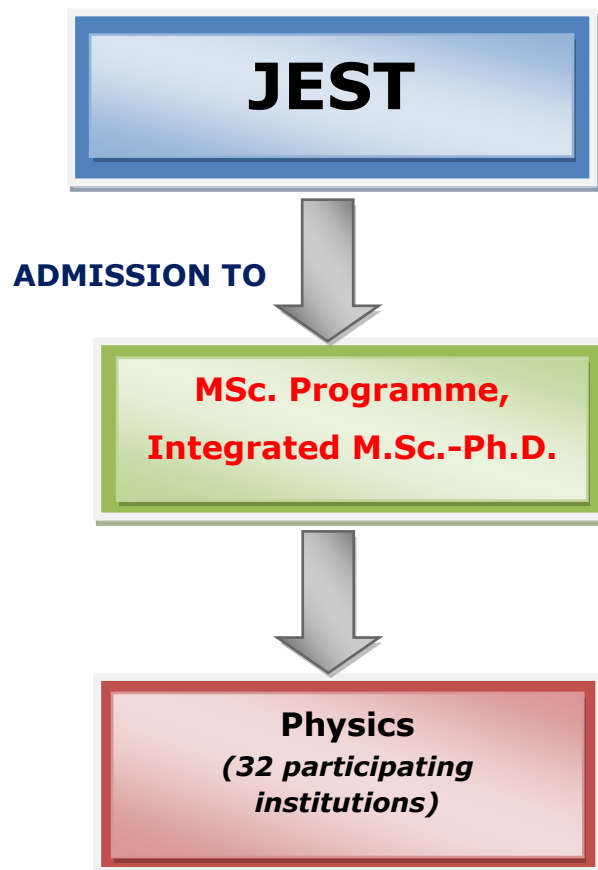
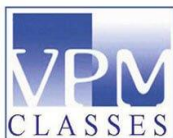


## JEST

- JEST also known as **Joint Entrance Screening Test** is conducted for selecting candidates to be interviewed for admission **Ph.D./Integrated M.Sc.-Ph.D. Programs** in Physics in a number of reputed institutes in the country.
- The JEST examination is held for two subjects only, namely, physics and theoretical computer
- JEST score forms an important component in the selection of candidates for the PhD and integrated PhD programmes in the **32 participating institutions**.





# VPM CLASSES

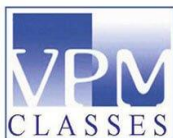
IIT-JAM, UGC NET, CSIR NET, GATE, JEST, JNU, BHU, TIFR

## **ELIGIBILITY CRITERIA: -**

- No restriction on age for appearing in JEST examination.
- Please see the websites/advertisements of the participating institutes for their eligibility criteria in details.

### **PARTICIPATING INSTITUTES**

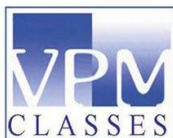
<b>PARTICIPATING INSTITUTES</b>			
<b>INSTITUTES</b>		<b>PROGRAMS</b>	<b>ELIGIBILITY</b>
<b>ARIES</b>	Aryabhata Research Institute of Observational Sciences, Nainital	Ph.D. programme	M.Sc. degree in Physics
<b>Bose Institute</b>	Bose Institute, Kolkata	Integrated M.Sc - PhD	B.Sc. (Physics / Mathematics) / B.E. / B.Tech.
<b>HBNI</b>	Homi Bhabha National Institute, Mumbai	Ph.D. programme	M.Tech/M.Sc.(Engg)/M.Phil/ M.V.Sc./M.Pharm./M.D./equivalent • M.Sc. /equivalent
		M. Sc. Programme	B.Tech. or equivalent degree
<b>HRI</b>	Harish-Chandra Research Institute, Allahabad	M. Sc. Programme	B. Sc. (Physics) or B.E./B.Tech. degree in any discipline
<b>ICTS-TIFR</b>	International centre for theoretical sciences (TIFR), Bangalore	Ph.D. programme	B.E. or B.Tech
		Integrated M.Sc. / M.Tech - Ph.D Programme	B. Sc. (Physics)
<b>IGCAR</b>	Indira Gandhi Centre for Atomic Research, Kalpakkam	Ph.D. programme	Master's degree
<b>IIA</b>	Indian Institute of Astrophysics, Bangalore	Ph.D. programme	M.Sc. in Mathematics / Applied Physics / Applied Mathematics / Optics and Photonics / Instrumentation / Electronics



# VPM CLASSES

IIT-JAM, UGC NET, CSIR NET, GATE, JEST, JNU, BHU, TIFR

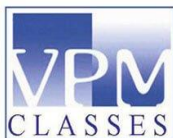
		Integrated M.Sc. / M.Tech - Ph.D Programme	B.Sc. (Physics / Mathematics) / B.E. / B.Tech. in Electrical / Instrumentation / Engineering Physics / Electronics and Communications / Computer Science and Engineering / Optics and Photonics
		Integrated M.Tech - Ph.D. Programme	M.Sc. (Physics / Applied Physics) / Post-B.Sc. (Hons) in Optics and Optoelectronics / Radio Physics and Electronics.
<b>IISc</b>	Indian Institute of Science, Bangalore	Ph.D. programme	B.E. or B.Tech
<b>IISER BHOPAL</b>	Indian Institute of Science Education and Research Bhopal	Integrated Ph.D Programme	B.Sc./B.Tech./B.E.
<b>IISER KOLKATA</b>	Indian Institute of Science Education and Research Kolkata	Ph.D. programme	Master's degree
<b>IISER MOHALI</b>	Indian Institute of Science Education and Research, Mohali	Ph.D. programme	B.E. or B.Tech
<b>IISER PUNE</b>	Indian Institute of Science Education and Research, Pune	Ph.D. programme	B.E. or B.Tech
		Integrated M.Sc. / M.Tech - Ph.D Programme	B. Sc. (Physics)
<b>IISER THIRUVANANTHAPURAM</b>	Indian Institute of Science Education and Research, Thiruvananthapuram	Ph.D. programme	B.E. or B.Tech
		Integrated Ph.D Programme	B. Sc. (Physics) or B.E. / B. Tech. in any discipline
<b>IISER TIRUPATHI</b>	Indian Institute of Science Education and Research, Tirupathi	Ph.D. programme	Master's degree in Science / Mathematics or a four-year Bachelor degree
<b>IIST</b>	Indian Institute of Space Science and	Ph.D. programme	Master's Degree in Science



# VPM CLASSES

IIT-JAM, UGC NET, CSIR NET, GATE, JEST, JNU, BHU, TIFR

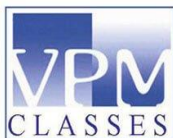
	Technology, Thiruvananthapuram	M. Sc. Programme	BE/B. Tech or equivalent degree
<b>IMSc</b>	The Institute of Mathematical Sciences, Chennai	Ph.D. programme. (Physics)	B.E. or B.Tech
		Integrated M.Sc. / M.Tech - Ph.D Programme	B. Sc. (Physics)
		Integrated Ph.D Programme in Theoretical Computer Science	B.Sc./B.E./B.Tech./M.C.A. in Computer Science
<b>IOP</b>	Institute of Physics, Bhubaneswar	Ph.D. programme	M.Sc. in Physics with a minimum of 55% marks
<b>IPR</b>	Institute for Plasma Research, Gandhinagar	Ph.D. programme	MSc in Physics, Engineering Physics or Applied Physics
<b>IUCAA</b>	Inter-University Centre for Astronomy and Astrophysics, Pune	Ph.D. programme	<ul style="list-style-type: none"> <li>B.E. or B.Tech</li> <li>M.Sc. in Physics / Electronics / Astronomy / Applied Mathematics</li> </ul>
<b>JNCASR</b>	Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore	Ph.D. programme	B.E. or B.Tech
<b>NBRC</b>	National Brain Research Centre, Manesar	Ph.D. programme in Neuroscience	<ul style="list-style-type: none"> <li>M.Sc (Physics/ Mathematics)</li> <li>B.E/ B.Tech/ M.C.A in Computer Science</li> </ul>
<b>NCRA-TIFR</b>	National Centre for Radio Astrophysics, TIFR, Pune	Ph.D. programme	B.E. or B.Tech
		Integrated M.Sc. / M.Tech - Ph.D Programme	B. Sc. (Physics)
<b>NISER</b>	National Institute of Science Education and Research, Bhubaneswar	Ph.D. programme	M.E./ M.Tech in Applied Physics
		Integrated M.Sc. / M.Tech - Ph.D Programme	B.Sc (Physics) or B.E./B. Tech in Engineering Physics , with a minimum of first class marks



# VPM CLASSES

IIT-JAM, UGC NET, CSIR NET, GATE, JEST, JNU, BHU, TIFR

<b>PRL</b>	Physical Research Laboratory, Ahmedabad	Ph.D. programme	<ul style="list-style-type: none"><li>Bachelor's and Master's degrees in Science or Engineering with first class (60%)</li><li>Proficiency in basic physics and mathematics</li></ul>
<b>RRCAT</b>	Raja Ramanna Centre for Advanced Technology, Indore	Ph.D. programme	M.Sc. in Physics
<b>RRI</b>	Raman Research Institute, Bangalore	Ph.D. programme	B.E. or B.Tech
<b>SINP</b>	Saha Institute of Nuclear Physics, Kolkata	Ph.D. programme	M.Sc. in Physics
<b>SNBNCBS</b>	Satyendra Nath Bose National Centre for Basic Sciences, Kolkata	Ph.D. programme	M.Sc. in Physics, Chemistry, Applied Mathematics, Biophysics or Biochemistry
		Integrated M.Sc. / M.Tech - Ph.D Programme	B. Sc. (Physics / Mathematics)
<b>TIFR-TCIS</b>	TIFR Centre for Interdisciplinary Sciences, Hyderabad	Ph.D. programme	B.E. or B.Tech
		Integrated M.Sc. / M.Tech - Ph.D Programme	B. Sc. (Physics)
<b>TIFR</b>	Tata Institute of Fundamental Research, Mumbai	Ph.D. programme	B.Tech Eng. Phys
<b>UGC-DAE CSR</b>	UGC-DAE Consortium for Scientific Research, Indore	Ph.D. programme	M.Sc. in Physics
<b>VECC</b>	Variable Energy Cyclotron Centre, Kolkata	Ph.D. programme	M.Sc. in Physics

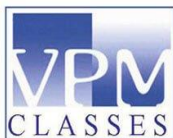


# VPM CLASSES

IIT-JAM, UGC NET, CSIR NET, GATE, JEST, JNU, BHU, TIFR

## EXAM PATTERN

PATTERN	FOR PH
<b>Duration of the examination</b>	3 hours
<b>Mode of Exam</b>	Offline
<b>Medium</b>	English
<b>Number of Questions</b>	<b>TOTAL 50 questions</b> Part A – 25 questions Part B – 15 questions Part C – 10 questions
<b>Marks for Correct Answer</b>	Part A - 1 mark each Part B – 3 marks each Part C – 3 marks each  (In Part C, the answer must be answered by integers of 4 digits each. For eg. If it is 0, you must fill in 0000)
<b>Marks for Incorrect Answer</b>	Part A – -1/3 (negative one third mark) Part B – -1 (negative one mark) Part C – NO NEGATIVE MARKS



# VPM CLASSES

IIT-JAM, UGC NET, CSIR NET, GATE, JEST, JNU, BHU, TIFR

## Syllabus:

### **Mathematical Methods**

Vector algebra and vector calculus, tensors, curvilinear coordinate systems, linear algebra; Linear differential equations, elements of Sturm–Liouville theory; Special functions; Complex analysis; Fourier series and Fourier transforms, Laplace transforms; Elementary properties of discrete groups; Elements of probability theory, error analysis.

### **Classical Mechanics**

Newton's laws, conservation of energy and momentum, collisions; generalized coordinates, principle of least action, Lagrangian and Hamiltonian formulations of mechanics; Symmetry and conservation laws; central force problem, Kepler problem; Small oscillations and normal modes; special relativity in classical mechanics.

### **Electromagnetism & Optics**

Electrostatics and magneto statics, boundary value problems, multipole expansion; Fields in conducting, dielectric, diamagnetic and paramagnetic media; Faraday's law and time varying fields; displacement current; Maxwell's equations; energy and momentum of electromagnetic fields; Propagation of plane electromagnetic waves, reflection, refraction; Electromagnetic waves in dispersive and conducting media; diffraction, interference, polarization.

### **Quantum Mechanics**

Uncertainty principle; Schrodinger equation; central potentials, hydrogen atom; Orbital and spin angular momenta, addition of angular momenta; Matrix formulation of quantum theory, unitary transformations, Hermitian operators; Variational principle, time independent perturbation theory, time dependent perturbation theory.

### **Thermodynamics & Statistical Physics**

Laws of thermodynamics, work and heat, thermodynamic potentials; Elements of kinetic theory; Maxwell's relations; Statistical ensembles; partition function; classical ideal gas, harmonic oscillators; Classical and quantum statistics; Fermi and Bose gases; black body radiation; statistics of paramagnetism

### **Electronics**

Basics of semiconductor; p-n junctions, diodes, transistors; LCR circuits, rectifiers, amplifiers, active filters and oscillators; basics of OPAMPs and their applications; basics of digital electronics.