

# Joint Entrance Screening Test - 2012



## For Ph.D. Programmes in Physics / Theoretical Computer Science

*A common qualifying test for admissions to the Ph.D. Programmes in Physics in the below listed research institutions in India and Theoretical Computer Science in some of them. Qualifying in JEST does not entitle an applicant to get a Research Fellowship. Using the JEST results, each institute will call a limited number of candidates for its further selection procedure depending on its requirements. All selected candidates will receive Research Fellowships from the respective institutes.*

- 1. ARIES:** Aryabhata Research Institute of Observational Sciences, Nainital: Astronomy and Astrophysics, and Atmospheric Physics.
- 2. HBNI:** Homi Bhabha National Institute, Mumbai, a Deemed University.
- 3. HRI:** Harish-Chandra Research Institute, Allahabad: Theoretical Physics, Astrophysics.
- 4. IGCAR:** Indira Gandhi Centre for Atomic Research, Kalpakkam: Materials Science, Condensed Matter (Experimental and Theoretical), Radiation Damage and Accelerator-based Research, Sensors and Applications, Science and Technology of Nanomaterials, Computational Materials Science, Reactor Physics, Radiation Physics and Atmospheric Science.
- 5. IIA:** Indian Institute of Astrophysics, Bangalore: Astronomy and Astrophysics, Astronomical Instrumentation, Optics, and Atomic Physics.
- 6. IISc:** Indian Institute of Science, Bangalore: Condensed Matter Physics (Experiments and Theory), Astronomy and Astrophysics (Theoretical), Atomic and Optical Physics (Experimental), Bio-crystallography and Bio-informatics, and High Energy Physics (Theoretical).
- 7. IISER MOHALI:** Indian Institute of Science Education and Research, Mohali: PhD and Integrated PhD programmes in Quantum Information (Experiment & Theory), Complex systems & Networks, Theoretical Astrophysics & Cosmology, String theory, Statistical physics, Quantum thermodynamics, Condensed Matter (Theory & Experiment) NMR-Methodology, Ultra-fast Physics, Low temperature physics.
- 8. IISER PUNE:** Indian Institute of Science Education and Research, Pune: Field Theory, Theoretical Particle Physics, Condensed Matter Physics, Non-linear Dynamics, Complex Systems and Networks, Nuclear Magnetic Resonance Spectroscopy, Quantum Information Processing, Radio Astrophysics, Atomic Physics and Quantum Optics, Energy Studies, Solar and Plasma Physics, Nanosciences, Scanning Probe Techniques, and Semiconductor Physics and Devices.
- 9. IISER THIRUVANANTHAPURAM:** Indian Institute of Science Education and Research, Thiruvananthapuram: Experimental Condensed Matter: Magnetic and Superconducting materials, Nanoscience and Energy materials, Photonics, Soft Condensed Matter, Semiconductor Physics and Devices, Surface Sciences and Nano-scale Plasmonics, Terahertz and Ultrafast Spectroscopy; Theory: Cosmology, Classical and Quantum Gravity, Gravitational Wave Physics, Quantum Information Theory, Quantum Field Theory, and Statistical Physics.
- 10. IMSc:** The Institute of Mathematical Sciences, Chennai: Theoretical Physics, and Theoretical Computer Science.
- 11. IOP:** Institute of Physics, Bhubaneswar: Physics (Condensed Matter, Nuclear and High Energy Physics) and Accelerator-based Research.
- 12. IPR:** Institute for Plasma Research, Gandhinagar: Physics (Experimental and Theoretical).
- 13. IUCAA:** Inter-University Centre for Astronomy and Astrophysics, Pune: Physics, Astronomy and Astrophysics.
- 14. JNCASR:** Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore: Experimental and Theoretical Condensed Matter Physics, Statistical Mechanics, and Materials Science.
- 15. NCRA-TIFR:** National Centre for Radio Astrophysics, TIFR, Pune: Astronomy and Astrophysics.
- 16. NISER:** National Institute of Science Education and Research, Bhubaneswar: String theory, Lattice QCD, Experimental High energy Physics, Soft Condensed matter Physics, Electronic structure, Statistical mechanics, Superconductivity & Magnetism, Nano-science, Non-linear optics, Ultracold atoms, Quantum optics and Quantum Information.
- 17. PRL:** Physical Research Laboratory, Ahmedabad: Theoretical Physics, Astronomy and Astrophysics, Solar Physics, Space and Atmospheric Sciences, Planetary Science and Geo-Sciences.
- 18. RRCAT:** Raja Ramanna Centre for Advanced Technology, Indore: Lasers and their Applications, Laser Plasma Interaction, Cold Atom Physics, Condensed Matter Physics (Superconductivity and Magnetism, Crystals and Thin Films), Nanomaterials and Applications, Non-linear and Ultrafast Optical Studies, Beam Physics, and Free Electron Laser.
- 19. RRI:** Raman Research Institute, Bangalore: Astronomy and Astrophysics, Light and Matter Physics, Soft Condensed Matter Physics (Liquid Crystals, Physics in Biology), and Theoretical Physics.
- 20. SINP:** Saha Institute of Nuclear Physics, Kolkata: Condensed Matter Physics (Theory and Experiments), Nuclear Physics (Theory and Experiments), High Energy Physics (Theory and Experiments), Astroparticle Physics, Quantum Gravity, String Theory, Mathematical Physics, and Materials Sciences (Surface Science and Plasma Physics).
- 21. SNBNCBS:** Satyendra Nath Bose National Centre for Basic Sciences, Kolkata: Astrophysics and Cosmology, Chemical and Biological Physics, Condensed Matter Physics and Material Science, High Energy Physics and Quantum Field Theory, Mathematical Physics, Nanosciences, Quantum Optics and Quantum Information, Statistical Physics, and Complex Systems.
- 22. UGC-DAE CSR:** UGC-DAE Consortium for Scientific Research, Indore: Surfaces, Interfaces, Thin Films and Nanomaterials, Physics at Low Temperatures and High Magnetic Fields, X-ray, Optical and Electron Spectroscopic Studies Using Synchrotron and Laboratory Sources; Electrical, Magnetic and Thermal Properties of Condensed Matter; Condensed Matter studies using Magnetic Neutron Diffraction, Nuclear Technique Based Condensed Matter Physics-Positron Annihilation Spectroscopy, Mossbauer Spectroscopy, Experimental Nuclear Physics, Gamma Ray Spectroscopy of Nuclear High Spin States, and Nuclear Reactions.
- 23. VECC:** Variable Energy Cyclotron Centre, Kolkata: Accelerator Physics, Condensed Matter Physics and Materials Science, Nuclear Physics (Experiments and Theory), Relativistic Heavy Ion Collisions (Experiments, Theory, QCD and QGP), and Physics of Neutrinos (Experiments).

Visit <http://www.jest.org.in> to apply and for more information

## Eligibility

Students who expect to complete their final examination by August 2012 are also eligible to apply.

### Minimum Qualifications and Selection Procedures

#### Ph.D. Programme

**Physics:** M.Sc. in Physics or M.Sc. / M.E. / M.Tech. in related disciplines. Candidates with M.Sc. in Mathematics / Applied Physics / Applied Mathematics / Optics and Photonics / Instrumentation / Electronics will also be considered at IIA. Graduates with a B.E. or B.Tech. will also be considered at IISc, IMSc, IUCAA, JNCASR, NCRA-TIFR, RRI, IISER Mohali, IISER Pune, SNBNCBS and NISER. BE/BTech/BCA/BSc students can also apply for the integrated MSc-PhD programme, see below. In addition, talented final year B.Sc. and first year M.Sc. (in Physics / Electronics / Astronomy / Applied Mathematics) students may also apply to be pre-selected for research scholarship at IUCAA. Similar pre-selection is open at SNBNCBS for candidates who also have specialization in Bio-Physics, Optics and Opto-Electronics. At IPR, candidates should have a Master's degree in Physics, Engineering Physics or Applied Physics. Visit websites of participating institutes for further details.

**Theoretical Computer Science:** M.Sc./ M.E. / M.Tech. / M.C.A. in Computer Science and related disciplines, and should be interested in the mathematical aspects of computer science. Visit website of IMSc for further details.

#### Integrated M.Sc./M.Tech. – Ph.D. Programme

At HRI, IISER Pune, NCRA-TIFR and SNBNCBS, candidates with a Bachelor's degree will also be considered for the integrated M.Sc. – Ph.D. programme in Physics. At IMSc, graduates with B.Sc. / B.E. / B. Tech. degree will also be considered for admission to M.Sc. (Research) programme in Physics and Theoretical Computer Science, as part of an integrated Ph.D. programme. At SNBNCBS, graduates with B.Sc. (Physics/Mathematics) / B.E. / B.Tech. degree will be considered for the integrated Post-B.Sc.-Ph.D. programme in subject areas mentioned above. At IIA, graduates with B.Sc. (Physics / Mathematics) / B.E. / B.Tech. in Electrical / Instrumentation / Engineering Physics / Electronics and Communications / Computer Science and Engineering / Optics and Photonics will be considered.

**Integrated M.Tech.– Ph.D. Programme at IIA:** Graduates with M.Sc. (Physics / Applied Physics) / Post-B.Sc (Hons) B.Tech in Optics and Photonics, Radiophysics and Electronics / B.E. / B.Tech. degree in subjects mentioned above will be considered. Visit IIA website for details.

## How to apply

Candidates for Physics / Theoretical Computer Science can apply for JEST-2012 ON-LINE through <http://www.jest.org.in>. Although **ON-LINE applications are preferred**, for those who have difficulty in accessing internet, hard copy of the application form can be requested by writing to **JEST-2012, Department of Physics, Indian Institute of Science, Bangalore-560012**. Email applications and photocopies of printed applications will not be accepted. Details regarding the ongoing programmes at different institutions are available at JEST-2012 website. **Important change for JEST-2012: Application Fee of Rs. 100 (Rs. 50 for SC/ST) is payable.**

## Test Centres

Ahmedabad, Aligarh, Allahabad, Bangalore, Bardhaman, Bhopal, Bhubaneswar, Chandigarh, Chennai, Delhi, Goa, Guwahati, Hyderabad, Indore, Jaipur, Kanpur, Kharagpur, Kochi, Kolkata, Madurai, Mumbai, Nagpur, Nainital, Patna, Pune, Raipur, Roorkee, Sambalpur, Silchar, Siliguri, Thiruvananthapuram, Udaipur and Visakhapatnam.

## Important Dates

Website opening and on-line submission of applications will be enabled at <http://www.jest.org.in> from **November 14, 2011..**

Request for printed application forms should reach IISc by **December 5, 2011.**

Last date for receipt of the filled applications, and ON-LINE submission of applications, is **December 15, 2011.**

**JEST - 2012 (written test) will be held on Sunday, February 19, 2012, from 10.00 a.m. to 1.00 p.m.**

**Candidates seeking admission to any of the institutes for a Ph. D. Programme in Physics / Theoretical Computer Science may appear for JEST (written test in Physics or Theoretical Computer Science as applicable) at the test center chosen by the candidate.**