National Institute of Advanced Manufacturing Technology

Hatia, Ranchi – 834003

Department of Applied Sciences and Humanities

27-11-2025

List of shortlisted candidates for the engagement of highly skilled Manpower for Physics Laboratory

S No.	Name	DOB	Remarks
1	Bijoy Kumar	24-08-1999	
2	Sushant Sharma	08-10-1996	
3	Balram Kumar Yadav	18-08-1994	
4	Jayanta Mahto	07-04-2000	
5	Ankit Kumar Ohdar	08-02-2003	
6	Kaif Ahmad	17-11-2003	
7	Pintu Kumar	29-01-1996	
8	Gopinath Karmakar	18-04-1998	
9	Anshuman Singh	15-06-1998	
10	Saikat Santra	02-05-1995	*10, 12 and BSc mark statements are not submitted; During the interview/test, copy of certificates need to be submitted.

The above-mentioned short-listed candidates will have to appear for the written test, lab trade test and personal interview on 08th December 2025 at ILC, 1st floor of administrative building, NIAMT from 10.00 AM onwards.

Guidelines for written test:

All the candidates are informed to bring their original certificates and one Govt ID proof. After the certificate verification, the written test will be held on 08th December 2025 at ILC, 1st floor of administrative building, NIAMT at 10.30 AM. The mode of the written test would be multiple-choice-questions (MCQ) based exam. The duration of the exam would be 30 minutes. The syllabus for the written test is attached in the annexure.

Guidelines for Lab-trade test:

The candidates will have to appear for the lab-trade test on 08th December 2025 at Physics lab, 2nd floor of administrative building, NIAMT from 11.00 AM onwards. Lab experiment details are attached in the annexure.

The candidates will have to appear for the personal interview in front of experts committee that will be held 08th December 2025 at ILC, 1st floor of administrative building, NIAMT at 12.30 PM onwards. The candidates are advised to come prepared accordingly.

Written test syllabus:

Engineering Physics

Unit 1 **(8L)**

Quantum Mechanics: Matter waves, Properties of matter waves, Physical significance of wave function. Schrödinger's time dependent and time independent equation, Operators, Eigen values and Eigen functions, Expectation values, Applications of Schrödinger's equation, Motion of a free particle. Electron in an infinite deep potential well (rigid box), Electron in a finite deep potential well (non-rigid box)

Unit 2 **(7 L)**

Solid State Physics: Lattice parameters, Miller indices, inter planer distance of lattice plane, density of crystals (linear, planar and volume), Sommerfield's free electron theory. Density of states (3D), Fermi-Dirac probability function, Nearly free electron theory (E-k curve), classification of solids based on band theory

Unit 3 **(8 L)**

Semiconductor Physies: Electron and hole concentrations in semiconductors intrinsic density, intrinsic and Extrinsic conductivity, Position of Fermi level in intrinsic and extrinsic semiconductors, Law of mass action, Temperature variation of carrier concentration in extrinsic semiconductors, Electrical conduction in extrinsic semiconductor. Hall Effect.

Unit 4 **(7L)**

Laser Physics: Introduction to laser, Spontaneous and stimulated emission of radiations, Thermal equilibrium, Condition for Light amplification, Population inversion, Pumping (Three level and four level pumping). Optical resonator. Laser beam characteristics. Ruby laser, Nd-YAG Laser, He-Ne Laser, Semiconductor Laser, Engineering applications of Laser (Fiber optics, Laser material interaction)

Lab experiment details:

1. To find the hall coefficient, carrier concentration of a given semiconductor by using Hall Effect set-up.
2. To find the temperature dependent resistivity of a given semiconductor by Four Probe method.
3. To study the energy band gap & Diffusion Potential of P-N Junction.
   - Determination of the reverse saturation current I_0 & material constant η.
   - Forward Bias Characteristics of junction Diode.
4. To study the variation of magnetic field with position of paired coils in Helmholtz arrangementalong the axis of the coils carrying current.
5. Determination of Plank's constant using LED.
6. Determination of Numerical Aperture of a multimode optical fiber.