

**सूचना/NOTICE**

**विषय: संस्थान के विज्ञापन संख्या : IITR/1/2024, दिनांक 26.02.2024 द्वारा विज्ञापित तकनीकी सहायक के पदों (पोस्ट कोड TA2 एवं TA3) हेतु ट्रेड टेस्ट के पाठ्यक्रम के संबंध में ।**

संस्थान के नोटिस संख्या: 5(103)/1/2023/E.I, दिनांक 07.12.2024 के अनुक्रम में तकनीकी सहायक के पदों के सापेक्ष में आवेदन करने वाले अभ्यर्थियों को सूचित किया जाता है कि निम्नलिखित पदों (पोस्ट कोड TA-2 एवं TA-3) पर ट्रेड परीक्षा का आयोजन दिनांक 28 दिसम्बर, 2024 (शनिवार) को Institute of Engineering & Technology, सीतापुर रोड, लखनऊ में आयोजित होगी

In continuation of this office notice no. 5(103)/1/2023/E.I dated 09.10.2024, it is hereby informed to all eligible candidates that Trade Test for following Post (Post Codes TA2 and TA3) will be held on 28 December 2024 (Saturday) in Institute of Engineering & Technology, Sitapur Road, Lucknow.

प्रवेश पत्र संस्थान की वेबसाइट [www.iitrindia.org](http://www.iitrindia.org) पर दिनांक 13.12.2024 से डाउनलोड किया जा सकता है। अद्यतन सूचनाओं के लिए संस्थान की [www.iitrindia.org](http://www.iitrindia.org) का अवलोकन करते रहें। प्रवेश पत्र डाउनलोड करने में असुविधा होने पर अभ्यर्थी [so.recruit@iitr.res.in](mailto:so.recruit@iitr.res.in) पर सूचना प्रेषित कर सकते हैं।

Candidates can download the admit card from Institute website [www.iitrindia.org](http://www.iitrindia.org) w.e.f. 13.12.2024. For latest updates, candidates are requested to keep visiting Institute website [www.iitrindia.org](http://www.iitrindia.org) regularly. Candidates can inform to us in case of any difficulty in downloading the admit card through email at [so.recruit@iitr.res.in](mailto:so.recruit@iitr.res.in)

अन्य पदों पर अनुशंसित किए गए अभ्यर्थियों हेतु क्षेत्र-वार पाठ्यक्रम (syllabus) को शीघ्र ही संस्थान की वेबसाइट पर अधिसूचित किया जायेगा।

The area-wise syllabus for trade test for the recommended applicants of the other posts will be notified on the institute's website shortly.

Sd/-  
Administrative Officer  
CSIR-IITR

**Syllabus for Trade Test / Paper -III Test for the post of Technical Assistant, Post Code:**

**TA2 , Area: Electrical Engineer against Advt. No. IITR/1/2024.**

**Electrical Branch**

Basic Concepts:	Concepts of resistance, inductance, capacitance and various factors affecting them Concepts of current voltage, power, energy and their unit.
Circuit Law:	Ohms Law, Simple Circuit solution and calculations using Ohms Law.
Magnetic Circuits	Concepts of flux, mmf, reluctance, Different kinds of magnetic materials, inductance, inductance calculation in series and parallel.
Electro statics	Concepts of electric flux, emf, capacitors, values of capacitors, measurement of capacitors, capacitor calculation in series and parallel.
AC Fundamentals	Instantaneous, peak, RMS and average values of alternating waves, Representation of sinusoidal wave form, simple series and parallel AC Circuits consisting of RL and C, Resonance, Tank Circuit Poly Phase system – star and delta connection, 3 phase power, DC and sinusoidal response of R-Land R-C circuit.
Measurement and measuring instruments	Measurement of power (1 phase and 3 phase, both active and re-active) and energy, 2 wattmeter method of 3 phase power measurement, Measurement of frequency and phase angle Ammeter and Voltmeter (both moving oil and moving iron type), extension of range wattmeter, Multimeters, Megger, Energy meter AC Bridges Use of CRO, Signal Generators, CT, PT and their uses Earth Fault directions.
Electrical Machines:	(a)DC Machine – Construction, Basic Principles of DC motors and generators, their characteristics, speed control and starting of DC Motors Methods of braking motor, 17 Losses and efficiency of DC Machines (b) 1 phase and 3 phase transformers – Construction, Principles of operation, equivalent circuit, voltage regulation, OC and SC Tests, Losses and efficiency Effect of voltage, frequency and wave form on losses Parallel operation of 1 phase/3 phase transformers Auto transformers (c) 3 phase induction motors, rotating magnetic field, principles of operation, equivalent circuit, torque-speed characteristics, starting and speed control of 3 phase induction motors Methods of braking effect of voltage and frequency variation on torque speed characteristics Fractional Kilowatt Motors and Single Phase Induction Motors: Characteristics and applications.
Synchronous Machines	Generation of 3-phase emf armature reaction, Voltage regulation, basic knowledge of AC alternators, synchronizing, control of active and reactive power Starting and applications of synchronous motors.
Generation, Transmission and Distribution	Different types of power station, Load factors, diversity factors, demand factors, cost of generation, inter-connection of power stations Power factors improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults Switchgears – rating of circuit breakers, Principles of arc extinction by oil and air, HRC Fuses, Protection against earth leakage / over current etc. Buchholtz relay, Merz-Price system of protection of generators & transformers, protection of feeders and bus bars Lightning arresters, various transmission and distribution system, comparison of conductor materials, efficiency of different system Cable – Different type of cables, cable rating and derating factor.
Estimation and costing	Estimation of lighting scheme (domestic as well as industrial wiring), electric installation of machines and relevant IE rules Earthing practices and IE Rules, load calculation.
Utilization of Electrical Energy	Illumination, different type of light fittings, Electric heating, Electric welding, Electroplating, Electric drives and motors (three phase and single phase), Basic knowledge of lift and escalators.
Protective device	Basic knowledge of earthing, Lightning conductor, surge protector and isolation transformer.
Alternator	Maintenance and varnishing of alternations.

## **Syllabus for Trade Test/Paper -III Test for the post of Technical Assistant, Post**

**Code: TA3, Area: Civil Engineer against Advt. No: IITR/1/2024.**

### **Civil Engineering**

1. Basic Knowledge of MS WORD, MS EXCEL and auto CAD.
2. Engineering and Building Drawing: Scales, Lettering Dimensioning, Orthographic, Isometric, Sections, Common Symbols and conventions, Drawing of building components as Walls, Footing, Doors, Windows, Staircases.
3. Environmental Engineering Ecology and Environment, disaster management Building water supply, Quantity and Quality of water, water treatment, waste water and sewage treatment, laying and construction of sewers and solid waste management.
4. Fluid Mechanics: Units and Measurement Properties of fluids. Hydrostatics forces flow through pipes and channels, pumps and turbines, Water Methods of irrigations, Hydrology, Runoff, requirement for Crops, wells and tube wells, Cross draining works. Water logging river training works.
5. Applied Mechanics, SOM and structural Analysis Force System, equilibrium, friction, centroid, moment of inertia. Kinematics and Kinetics of rigid bodies, Simple stresses normal stresses, Shear stresses in beams. Shear force and bending moment diagrams for determinate beams and frames.
6. Surveying Basic principles of chain surveying Compass surveying Leveling Plane Table, Theodolite and Total Station surveying.
7. Building Materials and Building Construction knowledge of different building materials including Testing for Bricks, Solid and Hollow Blocks, stones, cement, aggregates, concrete, steel lime, paints and varnishes. Bitumen Timber and Aluminium and Joinery Works. Construction of building using framed construction in concrete and steel and load bearing structures Surface finishes, Brick Masonry, Stone masonry and composite construction.
8. Concrete Technology: Properties of concrete in fresh and hardened state water cement ratio, hydration process, Design mix of concrete. Laboratory and field tests on concrete Compaction finishing and curing of concrete, Basic knowledge of special concretes, Ready Mix concrete Fibre Reinforced concrete. Self Compacting concrete, high strength Concrete etc.
9. Reinforced Cement Concrete and Steel Design Philosophies, Design using Limit State method for Beams, slabs, columns, staircases and footing for Strength and serviceability. Design of steel Beams tension members, compression members, built-up beams, plate girders roof trusses etc. Earthquake resistant design. Knowledge of related latest IS codes, IS 1893, IS456 IS800 IS13920 IS4326 etc.
10. Highway Engineering: Materials involved in Highway Construction. Type of Highway pavements, Hill road, drainage and Highway maintenance.
11. Soil Mechanics and foundation engineering Properties of different types of soils, effective stress, deformation of soil compaction, consolidation shear strength, Soil exploring, Bearing Capacity of soil, Earth pressure and stability of Retaining walls etc.
12. Estimation and Costing: Specifications, Analysis of rates, Preparations of tender documents, Accounts and procedures. Arbitration and disputes Schedule of rates, Estimation of building works, Highway works Drainage works, water supply and sanitary installations electrical Installations. Construction Project management, PERT, Planning, Organization, Labour Scheduling Control of Progress, safety, Inspection and Quality control, Repair and Maintenance of building works.