सीएसआईआर-संरचनात्मक अभियांत्रिकी अनुसंधान केन्द्र
CSIR-STRUCTURAL ENGINEERING RESEARCH CENTRE
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् Council of Scientific and Industrial Research)
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सं.No.A1(539)82-Rct. **दि.Dated: 20.02.2026**

अधिसूचना NOTIFICATION

विषय Sub: Recruitment to the posts of Technical Assistant (Post Code- TA-FFL, TA-KRD, TA-WEL & TA-BKMD) against CSIR-SERC Advt. No. SE-2/2021– Syllabus for Trade Test & Competitive Written Examination (CWE) - reg.

In continuation of CSIR-SERC notification of even number dated 07.02.2026 notifying the tentative dates for holding of Trade Test & Competitive Written Examination (CWE), the mode of selection, scheme/syllabus for Trade Test and Competitive Written Examination (CWE) for recruitment to the aforesaid posts of Technical Assistant are as follows:-

Mode of Selection:

The candidates fulfilling all necessary eligibility criteria as recommended by the Screening Committee will be invited for Trade Test and those who qualify in the Trade Test will be called for Competitive Written Examination (CWE) consisting of three papers. The second and third paper will be evaluated only for those candidates who secure the minimum threshold marks (to be determined by the Selection Committee) in the first paper. The final merit list will be prepared on the basis of the performance of the candidates in the written examination.

Scheme & Syllabus of Examination:

Competitive Written Examination (CWE)	
Mode of Examination	OMR based or computer based objective type multiple-choice examination.
Medium of Questions	The questions will be set both in English and Hindi except the questions on English Language.
Standard of exam	Diploma/Graduation Level (based on the advertised qualification of the post)
Total No. of Questions	200
Total Time Allotted	3 hours

Paper I (Time allotted – 1 hour)

Subject	No. of Questions	Maximum Marks	Negative Marks
Mental ability test*	50	100 (two marks for every correct answer)	There will be no negative marks in this paper.

* Mental Ability Test will be so devised so as to include General Intelligence, Quantitative Aptitude, Reasoning, Problem Solving, Situational Judgment, etc.

Paper II (Time allotted – 30 minutes)

Subject	No. of Questions	Maximum Marks	Negative Marks
General Awareness	25	75 (three marks for every correct answer)	One negative mark for every wrong answer.
English language	25	75 (three marks for every correct answer)	One negative mark for every wrong answer.

Paper III (Time allotted – 90 minutes)

Subject	No. of Questions	Maximum Marks	Negative Marks
Concerned subject	100	300 (three marks for every correct answer)	One negative mark for every wrong answer.

The syllabus for Trade Test and CWE (i.e. Paper III) related to respective trade is enclosed as follows:

S.NO	Post Code	Name of the Trade	Annexure
1.	TA-FFL	Mechanical Engineering/Technology	I
2.	TA-KRD	Library and Information Science	II
3.	TA-WEL	Electronics and Communication Engineering/ Electronics Engineering/Instrumentation Technology	III
4.	TA-BKMD	Computer Engineering/Technology	IV

The date, time & venue of holding Trade Test & Competitive Written Examination will be notified shortly. Candidates are advised to visit the CSIR-SERC website www.serc.res.in for updates.

Patnayak

(लोकनाथ पटनायक Lokanath Patnayak)

प्रशासनिक अधिकारी Administrative Officer

20.02.26

ANNEXURE – I

SYLLABUS FOR TRADE TEST AND COMPETITIVE WRITTEN EXAMINATION (CWE) FOR THE POST OF TECHNICAL ASSISTANT (FFL) (MECHANICAL ENGINEERING/TECHNOLOGY) (POST CODE –TA-FFL) AGAINST ADVT. NO. SE-02/2021.

1. MATERIAL SCIENCE & ENGINEERING:

Materials and Manufacturing Processes: Engineering Materials, Classification and their Properties, Metal Casting, Moulding, Patterns, Metal Working, Metal Forming, Machine Tools and Machining Processes, Lathe Machine and types, Milling Machine and types, Shaper and Planer Machines: Differences, Operations, Failure analysis & Testing of Materials, Corrosion & Surface Engineering, Engineering plastics & fibers, Insulating materials.

2. TOOL ENGINEERING:

Metal cutting, cutting fluids: types; characteristics and applications, Types of Tool wear, Tool life calculation, Machinability, Tool material types, characteristics and applications, Cutting Tool Geometry, Types of dies and construction, Punch & Die mountings, Die Design Fundamentals, Forming and Drawing Dies.

3. MANUFACTURING ENGINEERING:

Cutting Fluids & Lubricants, Lathe Operations, Broaching Machines, Drilling, Welding, Milling, Press working operations, Principles of Grinding and finishing processes.

4. MEASUREMENTS & METROLOGY:

Methods of measurements: Direct & Indirect; Standards of measurements, Precision and Accuracy, Sensitivity and Repeatability, Range, Threshold, Hysteresis, Calibration, Errors in Measurements, Thread measurements: Thread gauge micro meter; Angle measurements: Bevel protractor, Sine Bar; Gauges: plain plug gauge, ring Gauge, snap gauge, limit gauge, Comparators: Characteristics and Types, Surface finish, surface roughness tester, Transducers and Strain gauges, Force measurement: Spring Balance, Proving ring, Load cell; Torque measurement: Prony brake, Eddy current, Hydraulic dynamometer; Pressure measurement: McLeod gauge; Classifications of tachometers, Displacement measurement, Flow measurement, Resistance thermometers, Optical Pyrometer, Humidity measurement, Density measurement, Liquid level measurement, Instruments for Angular Measurements; Screw thread measurements, Gear Measurement and Testing: Measurement of tooth thickness, Errors in gears; Machine tool testing: Parallelism, Straightness, roundness; Concept of Limits, Fits, and Tolerances; Hole and Shaft Basis System.

5. STRENGTH OF MATERIALS:

Simple Stresses and Strains, Strain Energy, Shear Force & Bending Moment Diagrams, Theory of Simple Bending and Deflection of Beams, Torsion in Shafts and Springs, Thin Cylindrical Shells.

6. ADVANCED MANUFACTURING PROCESSES:

Jigs & Fixtures, Jig Boring, Plastic Processing, and its fabrication methods, Modern Machining Processes, CNC Programming and Machining, CNC Turning Machine, CNC Milling Machines, Machine Tool Automation, Special Purpose Machines (SPM), Maintenance of Machine Tools, Computer Aided Machine Drawing: (Introduction).

7. THEORY OF MACHINES & MECHANISMS:

Cams and Followers, Power Transmission, Flywheel and Governors, Brakes, Dynamometers, Clutches & Bearings, Balancing & Vibrations.

8. PRODUCTION OPERATIONS MANAGEMENT:

Process Planning and Process Engineering, Production forecasting, Forecasting methods, Forecast accuracy, Scheduling, Break-Even Analysis, Aggregate Operations Planning, Assembly Line Balancing, Material Management.

9. THERMAL ENGINEERING:

Basic concepts and gas laws, Laws of thermodynamics, Steam generator, Steam prime movers, Steam condensers, Heat transfer, Principles, Ignition, IC engines: Cooling, Lubrication.

10. REFRIGERATION & AIR CONDITIONING:

Principles of refrigeration, Refrigeration methods, Units of refrigeration, Refrigeration systems and their applications, Refrigerants, Heat load calculations, Air-conditioning systems, window AC, split AC, central AC system and Heat Ventilation Air-conditioning system (HVAC), Evaporative cooling with example of desert cooler, water chillers and their applications.

11. BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING:

Definition of voltage, current, power and energy with their units, advantage and applications of electricity, electromagnetic induction, domestic and industrial electromechanical installation, electrical motor, electrical safety, basic and digital electronics.

12. ENVIRONMENTAL STUDIES AND RENEWABLE ENERGY:

Natural resources, forest, water, mineral, energy and land resources, eco system, air, water, soil, noise and thermal pollution, environment protection act, air and water pollution act, solar, wind and tidal energy, Green building concept, Building rating.

13. FIRE FIGHTING SYSTEM

Design and installation wet riser system, Sprinkler system, Fire alarm system, Water supply system and Fire & Industrial safety equipment.

ANNEXURE – II

SYLLABUS FOR TRADE TEST AND COMPETITIVE WRITTEN EXAMINATION (CWE) FOR THE POST OF TECHNICAL ASSISTANT (KRD) (LIBRARY AND INFORMATION SCIENCE) (POST CODE –TA-KRD) AGAINST ADVT. NO. SE-02/2021.

1. FOUNDATIONS LIBRARY & INFORMATION SCIENCE:

Development of libraries, Role of Libraries in libraries. Society, Laws of Library Science, Types of libraries.

Librarianship as a Profession, Library Legislation, Library co-operation & Resource sharing, Professional Associations: National & International Associations.

2. REFERENCE SERVICE & INFORMATION SOURCES:

Reference Service, Types of Reference Service, Organization & Management of Reference Department, reference sources. Study and evaluation of reference sources, Reference Questions, User Education.

3. INFORMATION SCIENCE:

Documentation and Information Science, Sources of Information, Information & information needs of users, Information Transfer: Communication of Information.

Information services, Information Systems &Information Networks and Centers**.**

4. KNOWLEDGE ORGANIZATION:

Classification, Universe of Knowledge-Structure and attribute, Normative Principles of Classification & their application. Species of classification schemes, Standard schemes of classification and their features, Colon Classification, Dewey Decimal Classification and Universal Decimal Classification, Trends in library classification.

Information storage and retrieval, Indexing (Pre and Post Co-ordinate)

5. DOCUMENT DESCRIPTION:

Parts of a book, Library catalogue and its forms, Catalogue Entries, Normative Principles of Cataloguing. Principles and practices of document description, Standardization in description and bibliographic exchange, Subject cataloguing, Bibliographic control, Co-operation and Centralization in Cataloguing, Metadata Standards and Protocols: MARC-21, Z-39.50, Dublin Core etc.

6. INFORMATION TECHNOLOGY APPLICATION IN LIBRARIES:

Introduction and Communication Technology, Computer Application to Libraries & Information Centers, Networking and Internet, Library Automation, Plagiarism Detection Tools, High performance scanner, Printers, RFID, Barcode Technology.

Innovative Library Services by using technology

7. LIBRARY MANAGEMENT:

Management of Collection and Resources, Collection maintenance, HRM & Financial management, Reporting. Audit: Accession Register, Asset Abstract Register (AAR), Issue- Return Register, Visitor Register.

User Orientation Program Library Security: CCTV Camera, Security Guard, Close access, Pest Control, other Physical Security measures.

8. LIBRARY AUTOMATION AND DIGITIZATION:

Library Automation software: Koha, Libsys, Egranthalaya, Digital Library Software: Dspace, Eprint, Greenstone

9. DIGITAL INFORMATION RESOURCES:

E-Journals Consortiums, Resource sharing, Digital Object Identifier (DOI), Patent Databases, Standards, E-books, ISSN/ISBN/RNI.

10. SCIENTOMETRICS AND BIBLIOMETRICS:

Citation Analysis of Research & Development papers published, Indicators of Research Evaluation, Impact Factor, H-Index, 110 Index, Bibliometric Databases: Web of Science, Scopus etc.

11. BINDING, STOCK VERIFICATION AND WEEDINGOUT:

Binding of Loose Journals, Books, Documents, Thesis, Research Reports, Project Reports etc.

Physical Stock Verification and Weeding out of Obsolete Publications.

ANNEXURE – III

SYLLABUS FOR TRADE TEST AND COMPETITIVE WRITTEN EXAMINATION (CWE) FOR THE POST OF TECHNICAL ASSISTANT (WEL) (ELECTRONICS AND COMMUNICATION ENGINEERING / ELECTRONICS ENGINEERING/ INSTRUMENTATION TECHNOLOGY) (POST CODE –TA-WEL) AGAINST ADVT. NO. SE-02/2021.

1. COMPUTER ARCHITECTURE AND ORGANIZATION:

Computer Architecture Stored program concept, Number Representation, Basic Computer Organization and Design, Central Processing Unit, Memory Organization, Input-output Organization.

2. ELEMENTS OF ELECTRICAL ENGINEERING:

Concept of current, voltage, resistance; Work, Power, Energy and DC Circuit, D. C, Generator, D. C. Motor, Magnetism and Electromagnetism, Electromagnetic Induction, Energy Conversion Principle, Electrostatic, AC Fundamentals, Phasor Algebra.

3. ELEMENTS OF ELECTRONIC AND DEVICES:

Semiconductors, Electronic devices, Transistor, Transistor amplifier, Feedback circuit and oscillator, Special semiconducting devices, Integrated circuits.

4. ANALOG ELECTRONICS:

Semiconductor Devices, Rectifier and Power Supply, Bipolar Junction Transistor, Transistor Biasing, JFET, MOSFET AND UJT, Single Stage Transistor Amplifiers, Multistage Amplifier, Power Amplifier, Tuned Amplifier, Feedback Amplifier, Operational Amplifier, Oscillator, Relaxation Oscillator, Sweep Circuits, Microelectronics Technology.

5. ELECTRICAL CIRCUIT & NETWORK:

D. C Network Theorem (With independent Source), D. C Network Theorem (With dependent Source}, A. C Network Theorem, Single phase AC parallel circuit, Three phase circuit, Transients, Application of Mat lab.

6. COMMUNICATION ENGINEERING:

Introduction to communication systems, Modulation, Radiation and Propagation of Waves, Transmission Lines, Antennas, Microwave Devices and Systems, Demodulation, Transmitting Systems, Receiving Systems, Digital Communication, Mobile Communication, RADAR and Navigation

7. ELECTRONIC TEST & MEASUREMENTS:

Measurement fundamentals, electronic voltmeter & multimeter, Cathode Ray oscilloscope (CRO), signal generators, signal analysis, time and frequency measurement, AF and RF power measurement, automated measurement and data acquisition system.

8. DIGITAL ELECTRONICS:

Logic Levels, Logic Gates, Boolean algebra, Combinational Logic Systems, Flip-flops, Registers and Counters, Memory Devices, Converters.

9. MICROPROCESSORS:

Introduction to microprocessor, 8-bit Microprocessor Architecture, Instructions and Programming, 16 bit Microprocessor 8086, Interfacing.

10. POWER ELECTRONICS:

Power semiconductor devices, protection of power semiconductor devices, controlled rectifiers, inverters, dc regulated power supplies, power conditioners and ups, stepper motor.

11. ELECTRONIC INSTRUMENTATION:

Concept of instrumentation system, measurement of physical quantities, signal conditioning.

12. PRINTED CIRCUIT BOARD (PCB) TECHNOLOGY:

Requirement of a PCB, Copper Clad Laminates (CCL), Layout Planning, Artwork, Design Rules, Film Master preparation, Pattern transfer, Screen Printing, Etching, Chemical process and electroplating, Drilling, Computer in PCB Technology.

13. INDUSTRIAL ELECTRONICS:

Power devices, Thyristors, Rectifiers, Inverters, Choppers, Cycloconverters, Power supply, Motor speed control, Uninterruptible power supply, Electrical heating.

14. ELECTRICAL MEASUREMENT AND MEASURING INSTRUMENTS:

Unit, dimensions and Standards, Measurement and instrumentation system, Electromechanical instruments, Measurement of resistance, Potentiometer, A.C. Bridge, Measurement of current and voltage, Measurement of power, Measurement of energy, Instruments for special purpose, Electronics Instrument, Primary sensing, Element and transducer, Data transmission and telemetry Microprocessor based Instrumentation system.

15. INSTRUMENTATION SYSTEM:

Measurements, Performance characteristics of measuring instruments, Signals and response of measurement systems, Sensors and transducers, Pneumatic transducer, Signal conversion, Temperature measurements, Pressure measurements, Level measurements, flow measurements, Telemetering.

ANNEXURE – IV

SYLLABUS FOR TRADE TEST AND COMPETITIVE WRITTEN EXAMINATION (CWE) FOR THE POST OF TECHNICAL ASSISTANT (BKMD) (COMPUTER ENGINEERING/TECHNOLOGY) (POST CODE –TA-BKMD) AGAINST ADVT. NO. SE-02/2021.

1. COMPUTER ARCHITECTURE & ORGANIZATION:

Computer Architecture Stored Program concept, Number Representation (bits & bytes), Basic Computer Organization & Design, CPU – Components, Memory Organization – Primary, Secondary Memory, RAM/ ROM, Input -Output Organization – I/O devices.

2. COMPUTER APPLICATION & PROGRAMMING:

Number System and Codes – decimal, binary, octal, hexadecimal, Operating System – concepts, installation, types, C & C++ Programming – Variables, Constants, Control Structures, Arrays, Pointers, Classes, Objects.

3. COMPUTER HARDWARE AND NETWORK:

Computer System layout, Installation and Configuration of Secondary Memory and BIOS, Installation of Different Devices, Troubleshooting Basics, OS Installation, Basics of networking, Network Layers -- physical layer, medium access sub layer, The data link layer, network layer, transport layer, session layer, presentation layer, application layer , LAN configuration- VLANS, Modems, Switches, Rooters, Wi-Fi, Security fundamentals – Firewall, Antivirus, DDOS attacks.

4. DATA STRUCTURE:

Elementary data organization, Preliminaries: Mathematical notation and function, string processing, Arrays, Record and pointes, Linked lists, stacks, Queues, Recursion, Trees – nodes, leaves, binary trees , Graphs – Graph Types and their application, Sorting and Searching – Sorting and Searching Algorithms, File organization – File types, orientation.

5. DIGITAL ELECTRONICS:

Boolean Algebra and logic gates, Combinational Digital system, Flip Flops, Registers & Counters, Memory devices – Primary, Secondary and Tertiary memory, Display device.

6. MICROPROCESSOR AND INTERFACING:

Specific features of microprocessor, Internal architecture of a microprocessor, addressing modes and instructions execution, interfacing of memory and I/O Devices, Assembly language programming, Peripheral chips and their interfacing, PC interfacing and Intel 386 and 486 processors.

7. SYSTEM PROGRAMMING:

Fundamentals of language processing, Assembly language, Symbol tables, Macros, Assemblers, Macro assemblers, Design of Assemblers, Loaders, Linkers, Interpreters, Compiler construction.

8. DATABASE MANAGEMENT SYSTEMS:

Database Environment, Database System Concept and Application – database types, schema, subschema, tables, views, functions, stored procedures, constraints, schedulers, E-R diagram, SQL – query types, query statements, Functional Dependencies and Normalization for relational database, transaction processing concepts, concurrency control techniques, Security and Integrity, Distributed database.

9. INTERNET & WEB TECHNOLOGY:

Internet fundamentals, TCP/ IP internet layering model, internet application and services – websites, web servers, web technologies, scripting languages, XML, SSL certification, clientserver paradigm, CSS, HTML, e-Commerce, web publishing and browsing, Interactivity tools.

10. JAVA PROGRAMMING:

Object oriented methodology – Data Abstraction, Inheritance, Polymorphism, Classes, Objects, Constructors, Java, Implementation of java features, JVM architecture, Package, Java I/O, exception handing, multi-threaded programming, network programming, GUI programming data base connectivity with JDBC.

11. OPERATING SYSTEM:

Processes, Process scheduling algorithms, Process Synchronization, Batch Processing, Time Sharing, Memory Management – Virtual Memory, Paging, Swapping, , File System – Allocation methods, Space Management, Input/output principals of I/O hardware & software, Device Management, Deadlocks – Handling deadlocks ,resource allocation, deadlock prevention algorithms, Distributed OS.

12. VISUAL PROGRAMMING:

.NET framework – Application Pools, Libraries, MSIL, CLR, CLS, Name spaces, assemblies, common language – VB, C#..NET features– supported platforms, authentication methods, cross-platform integration, data controls, Introduction to windows forms, Introduction to ADO.NET, data types and base class libraries, object oriented programming with VB.NET, visual inheritance apply inheritance techniques to forms, ASP.NET.