

Scheme of Written Examination for the posts of Technician and Technical Assistant advertised vide CIMAP Advt. No. 1/2020 and 1/2021 along with the Syllabus of Paper-III (post-code wise)

For the Posts of Technician

Mode of Examination for Technical Posts in CSIR

Group II (Technician)

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	SSC + ITI / XIIth Standard
Total No. of Questions	150
Total Time Allotted	2 hours 30 minutes

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)	<u>There will be no negative marks in this paper.</u>

*Mental Ability Test will be so devised so as to include General Intelligence, Quantitative Aptitude, Reasoning, Problem Solving, Situational Judgement, 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 – 1 hour)

Subject	No. of questions	Maximum Marks	Negative Marks
Concerned Subject	50	150 (three marks for every correct answer)	One negative mark for every wrong answer

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For the Posts of Technical Assistant

Group III (Technical Assistant) [Erstwhile Group III(1) & III(2)]

For these posts, there will be 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.

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)	<u>There will be no negative marks in this paper.</u>

**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

Syllabus for Paper-III for Post of Technical Assistant (GRM/GRB), Post Code: T0820, Advt. No. 01/2020

Classes of seed; Seed Act regulations; Seed certification and testing,

Selection of land and study on specific cultivation practices (isolation distance, seed treatment, sowing / planting pattern, rouging, harvesting etc.) in seed production plots; Varietal identification at different growth stages in seed production fields, Seed testing for physical purity, moisture Content, viability, germination, Vigour index

Concepts of inheritance, Mendel's laws, Chromosomal theory of inheritance, Multiple alleles, Nature, Structure and replication of the genetic material, Genetic code, Transcription, Translation, mutation.

Early Plant Breeding, Accomplishments through plant breeding, Objectives of plant breeding, Plant introduction and role of plant genetic resources in plant breeding.

Self and cross-pollinated crops, mating systems. Heritability and genetic advance. Types of gene actions.

Pure line theory, pure line, mass selection and clonal selection methods.

Hybrid breeding: Heterosis and inbreeding depression, inbreeds, production of hybrid and their parent varieties/ inbreeds.

Genetic resources: primary, secondary, tertiary and alien trans gene pool.

Quality seeds: Introduction, history, and development of seed industry in India. Seed Act. Quality seed production. Intellectual Property Rights (IPR): Introduction, Intellectual Property, TRIPS, Plant Breeder's right (PBR) and farmer's rights, UPOV Act, Patents, PPVFRC Act (2001). Geographical Indications, International Convention on Biodiversity (ICBD), National Biodiversity Act.

Syllabus for Paper-III for Post of Technical Assistant (Photography/Mass Communication), Post Code: T0920, Advt. No. 01/2020

Photography

1. History of photography
2. Types of cameras
3. Types of photography
 - a. Macro photography
 - b. Landscape photography
 - c. Portrait Photography
 - d. Sports/ Action Photography
 - e. Night Photography
 - f. Stage photography
4. Resolution
5. ISO
6. Aperture
7. Shutter speed
8. Focal length
9. Histogram
10. Metering
11. White balance
12. Shutter Priority
13. Aperture priority
14. Processing
15. Types of files
16. Composition
17. Lens - wide angle and telephoto
18. Light
19. Exposure or exposure triangle
20. Depth of field
21. Report writing and press coverage

Mass Communication

1. Editing and Principles of Layout and Design
2. Mass Communication: Concepts and Processes
3. Reporting Techniques and Skills
4. Public Relations
5. Press Laws and Media Ethics
6. Basic of Camera, Light and Sound
7. Development Communication
8. Media Management and Ethics
9. New Media Technologies
10. Event Management
11. Photo Journalism
12. Radio Production
13. Television Production
14. Cyber Journalism
15. Photography and Web Content Development
16. World Media Scenario

Syllabus for Paper-III for Post of Technician (1) (Electrician), Post

Code: T1020, Advt. No. 01/2020

Occupational Safety and Health Basic safety introduction, Personal protection. Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution and personal safety message. Use of Fire extinguishers. Visit and observation of sections. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard, IE standards, BIS Specification and Standard.

Identification of Trade-Hand tools- Specifications, Uses and their care maintenance.
Explanation, Definition and properties of conductors, insulators and semi-conductors.
Wires/cable & its specification.

Introduction of National Electrical Code Voltage grading of different types of Insulators, Temp. Rise permissible.

Types of wires and cables standard wire gauge. Specification of wires and Cables-insulation and voltage grades - Low, medium and high voltage Precautions in using various types of cables / Ferrules Types of wire joints & uses.

Common Electrical Wiring Accessories, their specifications in line with NEC - Explanation of switches, lamp holders, plugs and sockets. Developments of domestic circuits, Alarm & Switches. Use & specification of Fire alarm, MCB, ELCB, MCCB. Application of battery /cell in Inverter, Battery Charger, UPS, etc.

Active and Reactive power, Simple problems on A.C. circuits, single phase and three-phase system etc. Problems on A.C. circuits. Power consumption in series and parallel, P.F. etc. Concept three-phase Star and Delta connection. Line and phase voltage, current and power in a 3 phase circuits with balanced and unbalanced load. Basics of DC power DG set Operations, ups, solar & non-renewable panels, AC, DC motors, induction operations, basic knowledge of transformer operation, 11kv, 33kv, Substations, load factor, preventive maintenance of transformer.

Earthing - Principle of different methods of earthing. i.e. Pipe, Plate, etc.

Importance of Earthing. Improving of earth resistance Earth Leakage circuit breaker (ELCB).

In absence of latest revision in respective BIS provision for Earthing it is recommended to follow IEC guidelines.

Electric wirings, I.E. rules. Types of wirings both domestic and industrial. Specifications for wiring. Grading of cables and current ratings. Principle of laying out in domestic wiring, Power rating, BEE Specification, Illumination rating.

Voltage drop concept.

Wiring system - P.V.C., concealed system. Maintenance and Repairing data sheet preparation. Specifications, standards for conduits and accessories

-Power Wiring

-Control Wiring

-Information Communication

Testing of wiring installation by meggar.

Study of Fuses, Miniature circuit breakers (MCB), ELCB, Relay Switch, MCCB, etc.

Under Ground Cable:

Construction of cables. Material for cables, its insulation. Classification of cables, cables for 3-phase service, Laying of underground cable. Types of cable faults and their location.

Schedule of electrical preventive maintenance. Break down, Routine & Preventive maintenance of DC/ AC machines, Constant Voltage stabilizer, U.P.S. & Equipment's.

National Building code, 2016 part-IV (Fire & Safety), classification of Fire hazards, Electrical fire prevention, etc.

Syllabus for Paper-III for Post of Technician (1) (Agronomy), Post Code: T1120, Advt. No. 01/2020

Crop weed competition, Herbicides classification, Application methods and equipment, Special weeds, parasitic and aquatic weeds and their management

History of Soil fertility and Fertilizer use, Concept of essentiality of plant nutrients, Principles and methods of fertilizer application; Integrated nutrient management and bio-fertilizers, Site-specific nutrient management.

Crop diversification, varieties, cropping systems, conservation cropping and mid-season corrections for aberrant weather conditions, Techniques of moisture conservation, Crops, varieties, cropping system and agronomic practices.

Crop production techniques for cereals, millets, legumes, oilseeds, fiber crops, sugarcane, tobacco, fodder and pasture crops including origin, history, distribution, adaptation, climate, soil, season, modern varieties, fertilizer requirements, intercultural operations, water requirement, weed control, quality components, industrial use, economics and post-harvest technology, Water harvesting, cropping patterns, alternate land use and crop diversification in rain fed areas.

Concepts of irrigation scheduling, Concept of critical stages of crop growth in relation to water supplies, merits and demerits of various methods, design and evaluation of irrigation methods, Management of water resources (rain, canal and ground water) for agricultural production; Characteristics of irrigation and family systems affecting irrigation management.

Syllabus for Paper-III for Post of Technician (1) (Electrician/Boiler),

Post Code: T1220, Advt. No. 01/2020

Occupational Safety and Health Basic safety introduction, Personal protection. Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution and personal safety message. Use of Fire extinguishers. Visit and observation of sections. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard.

Identification of Trade-Hand tools- Specifications, Uses and their care maintenance.
Explanation, Definition and properties of conductors, insulators and semi-conductors.
Wires/cable & its specification.

Introduction of National Electrical Code Voltage grading of different types of Insulators, Temp. Rise permissible.

Types of wires and cables standard wire gauge. Specification of wires and Cables-insulation and voltage grades - Low, medium and high voltage Precautions in using various types of cables / Ferrules Types of wire joints & uses.

Common Electrical Wiring Accessories, their specifications in line with NEC - Explanation of switches, lamp holders, plugs and sockets. Developments of domestic circuits, Alarm & Switches. Use & specification of Fire alarm, MCB, ELCB, MCCB. Application of battery /cell in Inverter, Battery Charger, UPS, etc.

Active and Reactive power, Simple problems on A.C. circuits, single phase and three-phase system etc. Problems on A.C. circuits. Power consumption in series and parallel, P.F. etc. Concept three-phase Star and Delta connection. Line and phase voltage, current and power in a 3 phase circuits with balanced and unbalanced load.

Earthing - Principle of different methods of earthing. i.e. Pipe, Plate, etc.

Importance of Earthing. Improving of earth resistance Earth Leakage circuit breaker (ELCB).

In absence of latest revision in respective BIS provision for Earthing it is recommended to follow IEC guidelines.

Electric wirings, I.E. rules. Types of wirings both domestic and industrial. Specifications for wiring. Grading of cables and current ratings. Principle of laying out in domestic wiring.

Voltage drop concept.

Wiring system - P.V.C., concealed system. Maintenance and Repairing data sheet preparation. Specifications, standards for conduits and accessories

-Power Wiring

-Control Wiring

-Information Communication

Testing of wiring installation by meggar.

Study of Fuses, Miniature circuit breakers (MCB), ELCB, Relay Switch, MCCB, etc.

Under Ground Cable:

Construction of cables. Material for cables, its insulation. Classification of cables, cables for 3-phase service, Laying of underground cable. Types of cable faults and their location.

Schedule of electrical preventive maintenance. Break down, Routine & Preventive maintenance of DC/ AC machines, Voltage stabilizer, U.P.S. & Equipment's.

Basic boiler operation, types and classification of boilers, IBR/Non IBR boiler, fire tube/water tube boiler, steam classification, operation and preventive maintenance of boiler, Fuel type of boilers.

Syllabus for Paper-III for Post of Technician (1) (HRD), Post Code: T1320, Advt. No. 01/2020

1. **Logical reasoning:** Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & de-coding, Numerical Operations, Symbolic Operations, Trends, Space Orientation, Space Visualisation, Venn Diagrams. Drawing inferences. Punched hole/pattern - folding & un- folding, Figural Pattern-folding and completion, Indexing, Address matching, Date & City- matching, Small & Capital letters/numbers coding, decoding and classification, Embedded 4 Figures.

2. **Numerical abilities:** Indices and surds, Percentage, Ratio & Proportion, Square roots, Averages, Interest, Basic School Algebra, Graphs of Linear Equations. Histogram, Frequency Polygon, Bar diagram. Pie chart, and any other topics of Matriculation level.

3. **Verbal reasoning:** Knowledge on English Language at the level of Matriculation (Synonyms, antonyms, spelling, Improvement of sentences, active/passive voice of verbs, comprehension passage etc.)

4. **General intelligence:** Current affairs, General Science, basic scientific concepts at matriculation level.

5. **Technical and Advanced knowledge on computer and computer applications:** Basics of computer operation, Processing units, memory, Hardware and software's, Input Devices, secondary storage devices, storage and retrieval of data, operating systems, MS-DOS, Windows, Unix. File management, installation of hardware's (printer, scanner etc.), data entry operation.

MS-Office applications, document preparation and document enhancement, advance applications of MS-Word, MS-Excel, MS-Power Point.

Networking concepts, LAN, WAN etc.

Information Technology - IT act, internet, e-mail, e-governance

Virus, anti-virus software's, Local language (Hindi) software's.

Syllabus for Paper-III for Post of Technician (1) (Vehicle Maintenance/Mechanical), Post Code: T1820, Advt. No. 01/2020

Occupational Safety & Health Importance of Safety and general Precautions to be observed in the shop. Basic first aid, safety signs - for Danger, Warning, caution & person safety message. Safe handling of Fuel Spillage, Fire extinguishers used for different types of fire. Authorization of Moving & road testing vehicles.

Auto Industry - Classification of vehicles on the basis of load as per central motor vehicle rule, wheels, final drive, and fuel used, axles, position of engine and steering transmission, body and load. Brief description and uses of Vehicle hoists -Two post and four post hoist, Engine hoists, Jacks, Stands - For farm application.

Engine Basics: Classification of engines, Principle & working of 2&4-stroke diesel engine (Compression ignition Engine (C.I)), Principle of Spark Ignition Engine(SI), differentiate between 2-stroke and 4 stroke, C.I engine and S.I

Engine, Direct injection and Indirect injection. Classification of vehicle- LMV/HMV, General maintenance/Repairing of vehicle.

Lubrication system: - purposes & characteristics of oil, type of lubricants, grade as per SAE, & their application.

Carburetor Operation-Carburetion, Carburetor system components, Carburetor systems.

Clutch: - types, construction and function. Components of clutch -driver & driven plates, torsion spring, cushion springs, operating fingers, clutch shaft, Slave cylinder & oil seal. Clutch release bearing & linkages. Manual and Auto Transmissions Functional description, types and their application. Gearbox- Use and applications

Steering & Suspension Systems Function and types of steering system. Description, construction and function of mechanical steering system steering wheel, steering gear box, tie-rod, arms link, ball and socket joints etc. their movement and adjustment.

Wheels & Tyres - Description, construction and function of Wheel. Rim sizes. Types & sizes of tyres. Solid, pneumatic & Radial. Ply rating. Tyre materials, Tyre information, Tyre ratings for temperature & traction. Importance of in -Flatting tyres to correct pressure. Preventive maintenance of tyres and tubes.

Braking Systems - Braking Fundamentals Principles of braking, Drum & disc brakes, Lever/mechanical advantage, Hydraulic pressure & force, Brake fade. Braking systems, Brake pedal, Brake lines, Brake fluid, Bleeding, Master cylinder, divided systems, Power booster or brake unit, Hydraulic brake booster, applying brakes, Brake force, Brake light switch Drum brake and its operation, Brake linings & shoes.

Syllabus for Paper-III for Post of Technical Assistant (Civil Engineering), Post Code: T0521, Advt. No. 01/2021

The standard of the questions in engineering subjects will be approximately of the level of Diploma in Civil Engineering. All the questions will be set in SI units. The details of the syllabus are given below:

1. Civil Engineering Drawing.
2. Workshop practice.
3. Computer application.
4. Building materials.
5. Building construction.
6. Concrete technology.
7. Structural Engineering.
8. Element of RCC design.
9. Soil & foundation engineering.
10. Earthquake resistant building construction.
11. Elements of steel structure design.
12. Estimation, costing and valuation.
13. Irrigation Engineering.
14. Principles of surveying.