

SELECTION PROCEDURE & SCHEDULE FOR SR. TECHNICAL ASSISTANT AND TECHNICAL ASSISTANT

[Ref – Recruitment Notice No./NITRR/R-1/Advt./2023/135 dated 30.06.2023]

Name of post – Senior Technical Assistant (Mechanical Engg & Computer Application)

Date of Test – 07.09.2023 (Thursday)

Time of Test – 10 AM TO 12.30 PM

Reporting Time – 9.30 AM

Venue –

- Dept. of Mechanical Engg (for Sr. Technical Assistant – Mechanical Engg) at NIT Raipur
- Dept. of Computer Application (for Sr. Technical Assistant – Computer Application) at NIT Raipur

Scheme of Examination

- Total Questions – 130 (MCQ Type)
- Maximum Marks – 130
- + 1 (One) for Each Correct Answer
- No Negative Marking
- Duration – 2.5 hours

Breakup

PART A

- | | |
|--------------------------------------|------|
| • General Awareness | (20) |
| • Reasoning | (20) |
| • Mathematics | (20) |
| • Test of English and Hindi Language | (30) |
| • Computer Awareness | (10) |

PART B

Specialization (30)

- Mechanical Engg. (*Syllabus refer page – 4*)
- Computer Application (*Syllabus refer page – 5*)

Note

- The Question Paper shall be Bilingual (English & Hindi) except the Section for the Test of Language wherever applicable.
- The medium of Part-B will be English only.
- In the event of conflict between the two versions, the English version shall prevail.
- Candidates must bring their original documents along with one set of photocopies and one Govt photo ID card along with them.
- Min. qualifying marks for preparation of merit shall be 50%. Ties (if any) shall be resolved as per the higher marks obtained in Part-B section of the test.

Name of post – Technical Assistant (Computer Application)

Date of Test	– 07.09.2023 (Thursday)
Time of Test	– 3 PM TO 5.30 PM
Reporting Time	– 2.30 PM
Venue	– Dept. of Computer Application at NIT Raipur

Scheme of Examination

- Total Questions – 130 (MCQ Type)
- Maximum Marks – 130
- + 1 (One) for Each Correct Answer
- No Negative Marking
- Duration – 2.5 hours

Breakup

PART A

- | | |
|--------------------------------------|------|
| • General Awareness | (20) |
| • Reasoning | (20) |
| • Mathematics | (20) |
| • Test of English and Hindi Language | (30) |
| • Computer Awareness | (10) |

PART B

- | | |
|---|------|
| Specialization | (30) |
| • Computer Application (<i>Syllabus refer page – 5</i>) | |

Note

- The Question Paper shall be Bilingual (English & Hindi) except the Section for the Test of Language wherever applicable.
- The medium of Part-B will be English only.
- In the event of conflict between the two versions, the English version shall prevail.
- Candidate must bring their original documents along with one set of photocopies and one Govt photo ID card along with them.
- Min. qualifying marks for preparation of merit shall be 50%.

Name of post – Technical Assistant (Computer Science & Engg.)

Date of Test	– 08.09.2023 (Friday)
Time of Test	– 10 AM TO 12.30 PM
Reporting Time	– 9.30 AM
Venue	– Dept. of Computer Science & Engg at NIT Raipur

Scheme of Examination

- Total Questions – 130 (MCQ Type)
- Maximum Marks – 130
- + 1 (One) for Each Correct Answer
- No Negative Marking
- Duration – 2.5 hours

Breakup

PART A

- | | |
|--------------------------------------|------|
| • General Awareness | (20) |
| • Reasoning | (20) |
| • Mathematics | (20) |
| • Test of English and Hindi Language | (30) |
| • Computer Awareness | (10) |

PART B

- | | |
|---|------|
| Specialization | (30) |
| • Computer Science & Engg. (<i>Syllabus refer page – 6</i>) | |

Note

- The Question Paper shall be Bilingual (English & Hindi) except the Section for the Test of Language wherever applicable.
- The medium of Part-B will be English only.
- In the event of conflict between the two versions, the English version shall prevail.
- Candidates must bring their original documents along with one set of photocopies and one Govt photo ID card along with them.
- Min. qualifying marks for preparation of merit shall be 50%.

Syllabus for Senior Technical Assistant (Mechanical Engg.), Part – B

Automobile Engineering:

Automobile and its development, Classification of automobiles, Transmission System, Steering System, Braking System, Dynamo and Alternator and Exhaust Emissions

Computer Integrated Manufacturing:

Introduction to NC, CNC & DNC, Construction and Tooling, Part Programming, System Devices, Problems in CNC Machines, Automation and NC system

Engineering Materials:

Scope of Material Science, Crystallography, Metals and Alloys, Heat Treatment, Plastics and Advanced Materials

Engineering Mechanics:

Laws of Forces, Moment, Friction, Centre of Gravity and Simple Machines

Fluid Mechanics:

Type and Properties of Fluids, Pressure and its Measurement, Flow of Fluids and Flow through Pipes

Heat-Transfer:

Modes of Heat Transfer, Fourier's Law, Steady State Conduction, Composite Structures, Natural and Forced Convection and Thermal Radiation

I.C. Engines:

Working Principle of two stroke and four stroke cycle, SI engines and CI Engines, Otto cycle, Diesel cycle, Dual cycle, Fuel Supply and Ignition System in Petrol Engine, Fuel System of Diesel Engine, Cooling and Lubrication and Testing of IC Engines

Machine Design:

Design-Definition Types of design, necessity of design, Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, endurance limit, Design of Joints, Design of Flange Coupling and Design of Screwed Joints

Machining and Machine Tool Operations:

Cutting Tools and Cutting Materials, Lathe, Drilling, Boring, Shaping and Planning, Broaching, Jigs and Fixtures and Cutting Fluids and Lubricants, Welding, Pattern Making, Metal Forming Processes

Mechanics of Materials:

Stresses and Strains, Resilience, Moment of Inertia, Bending Moment and Shearing Force, Bending Stresses, Columns, Torsion and Springs

Metrology and Inspection:

Linear and Angular Measurement, Measurement of surface Finish and Measurements of Screw threads and Gauges

Refrigeration and Air-conditioning:

Fundamentals of Refrigeration, Vapour Compression System, Refrigerants, Air Refrigeration System, Vapour Absorption System and Refrigeration Equipment

Theory of Machines:

Simple Mechanisms, Friction, Power Transmission, Flywheel, Governor and Balancing

Thermodynamics:

Fundamental Concepts, Laws of Perfect Gases, Thermodynamic Processes on Gases, Laws of Thermodynamics, Ideal and Real Gases and Properties of Steam

Turbo-machinery:

Introduction to Turbomachines, Classification of Turbomachines, Steam Turbines and Steam Condensers, Gas Turbines and Jet Propulsion

Syllabus for Senior Technical Assistant (Computer Application) & Technical Assistant (Computer Application), Part – B

○ **Computer Application**

1. Computer Organization and Architecture Binary representation, registers, Instruction set, timing and control, CPU, instruction cycle, addressing modes, CISC, RISC, synchronization, interrupt and exception, privileged and non-privileged instruction, hierarchical memory organization, memory mapping, cache memory, coherence, consistency, virtual memory, interleaving, DMA, Signed number, fixed and floating point numbers, control unit design, arithmetic and instruction pipelining: throughput, speedup, branch prediction, hazards
2. Programming, Data Structures, Algorithms, and Theory of Computation Programming in C, pointers, basic data structures, array, string, stack, queue, recursion, linear and non-linear data structures, searching and sorting algorithms, complexity and asymptotic analysis, Mealy and Moore machine, finite automata, Determinism and non-determinism, Regular expressions, minimization of deterministic finite automata PDA, regular grammar, CFG, Chomsky's hierarchy, closure properties, pumping lemma, Turing machine, halting problem
3. Operating System and Database Systems Basics of Popular Operating Systems (Linux & Windows), File and Directory Management, purpose of database system, Data Models, ER-Model, Introduction to UML, keys, integrity rules, Relational Database design, Normalization, Selection and projection, Joins, SQL: data definition, aggregate function, Null Values, nested sub queries, joined relations, ACID properties, serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods
4. Computer Networks and Web technologies Basic of Computer networks; LAN, WAN, OSI reference model, TCP/IP, sliding window protocol, Channel allocations problem, Ethernet, Wireless LAN, Broadband Wireless, routing algorithms, Congestion control algorithms, IPv4 and IPv6, Quality of Service, UDP and TCP, Domain name system, electronic mail, World Wide
5. Web: architectural overview, dynamic web document and http, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet, Concept of Internet, Applications of Internet, Search Engines

Syllabus for Technical Assistant (Computer Science & Engg.), Part – B

Unit-I: Hardware: Hardware Devices and Troubleshooting

- Components, tools and safety measures
- Assembling a PC • Firmware upgrade, Dual BIOS & BIOS settings
- Diagnose & Resolve issues related to a PC
- Laptop features, Components, tools and safety measures
- Diagnose & Resolve issues related to a Laptop
- Upgrading a PC or Laptop • Smartphone features and Tools & Safety • Types of printers • Installing and testing a printer
- Printer Maintenance
- Scanner Installation • Webcam Installation.

Unit-II: Programming and Data Structure:

- C Language • Object-oriented Programming • functions • data type • Recursion • Arrays
 • Stacks • Queues • Binary Search Trees • Sorting
- Web Designing: HTML and CSS • SQL • JavaScript

Unit-III: Operating system: Application & Troubleshooting • Different OS and Compatibility • Windows and Linux installation • Upgrading OS • Software Installation

- Working on MS Word, Excel & PowerPoint • MS Office troubleshooting • Different Browser setup • Backup, format & restore OS.

Unit-IV: Networking and Security:

- Basics of computer network • OSI Model • Transmission Media •
- Networking devices Network Topology • LAN Basics • IP Addressing • TCP/IP • Ethernet
- Advanced • Structured Cabling • Wireless Networking • Connecting a PC/Laptop to Internet •
- Installing a printer and sharing it in network • Joining a workgroup/domain • File sharing and troubleshooting • Remote Access • Basics of Wi-Fi • Internet security