Departmentof Instrumentation& Control Engineering

Sr. Technician Stage-I (Screening Test)

Stage-I (Screening Test): A screening test shall be conducted in the first phase in form of multiple choice written test. Written test shall be of **90 minutes'** duration comprising of **75** questions. Each correct answer will be awarded One [1] mark and for each wrong answer One-fourth [1/4] mark shall be deducted. Screening test shall consist of questions on General English(Tenses, Active and Passive, Direct and Indirect speech, Punctuation, Correction of sentences, One word substitutes, Modals, Articles, Clauses, Synonyms, Antonyms, Idioms and Phrases); Numerical Aptitude Arithmetic(Simplification of Fractions, Simple and Compound Interest, Profit and Loss, Percentage, Averages, Number System, Time and Work, Problems on Trains, Calendar, Area, Problems on Numbers, Square root, Cube root, Time and Distance and Other basic Arithmetic related matters);Reasoning and Data Interpretation (Number Series Compilation, Missing Number finding, Pattern series, Direction Sense Test, Series Compilations, Classification, Missing Character finding, odd man out, Blood relations, Analogy, Coding and Decoding, Letter and Symbol Series, Verbal reasoning, Statement and Conclusions, Letter and Symbol Series, Logical Problems, Arithmetic reasoning, Logical Sequence of words, Pie Chart and Bar Chart).

Eligible candidates **Ten Times** of the positions in each category will be screened for the Stage-II subject to the fulfillment of all educational qualification etc. as per the Recruitment Rules-2019.

Stage-II (Skill test)

Stage-II (Skill Test): The skill test will be of qualifying nature.

Laboratory Experiments etc. as per nature of the postshall be conducted in the respective laboratories/field. Minimum qualifying marks in the skill test will be [UR:30%; EWS:27%; OBC:27%; SC;20%; ST:20%; PwD:15%].

The candidates, who will qualify the skill test, will be called for the final written test. The Candidates appearing in the written test must ensure their eligibility for the particular category

of post. The documents in support of their eligibility shall be verified before the Final test. If any candidate will not have requisite qualification etc. as per the post for which he is appearing will not be allowed to sit in the final test (Stage-III).

Stage-III (Final test)

Stage-III (Final Test): Final written test shall be of 2 hours duration comprising of 100 multiple choice questions.

Each **correct answer will be awarded One [1] mark** and for each **wrong answer Onefourth [1/4] mark shall be deducted**. Only those who are screened in after the Screening test [Stage –I] and qualify the Skill Test [Stage-II] will be allowed to appear in the Final Test [Stage III]. The minimum passing marks in Final test will be [UR:30%; EWS:27%; OBC:27%; SC;20%; ST:20%; PwD:15%].

The final merit list shall be drawn on the basis of the stage-III written test.

SYLLABUS FOR SKILL TEST AND FINAL WRITTEN TEST IS AS PER ANNEXURE-IV.

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Syllabus of Skill Test (Senior Technician)

- 1. To verify Theremin's Theorem and Norton Theorem for a given network
- 2. To determine resonance frequency & Q factor in RLC circuits
- 3. To measure amplitude , frequency and phase angle by Cathode Ray Oscilloscope (CRO).
- 4. To measure the unknown. Resistance by *Wheatstone's bridge (use null deflection method.*)
- 5. To measure unknown capacitance by wien bridge
- 6. To perform open circuit test on a single phase transformer
- 7. To perform short circuit test on a single phase transformer
- 8. To determine the speed-Torque characteristics of a AC servo motor
- 9. To determine the speed-Torque characteristics of a DC servo motor
- 10. To Perform addition of two, 8-Bit numbers using assembly language code for 8085 microprocessor kit.
- 11. To Perform Hexadecimal additions of two numbers using assembly language code for 8085 microprocessor kit.
- 12. To convert temperature from °Celsius to °Fahrenheit and Kelvin scale.
- 13. To obtain Lissajous pattern for two different sinusoidal signals.
- 14. To plot the Characteristics of I/P converter and Pneumatic control valve in Pressure process station.
- 15. To determine PH, Conductivity and Turbidity of unknown Solution
- 16. To determine the viscosity of given sample

Departmentof Instrumentation& Control Engineering Syllabusfor Final writtentest(SeniorTechnician)

Computerawareness:

Basic knowledge of Computer Applications, viz; MS Word, MS Excel, Power Point etc. Internet,MS-DOS,Computer Generation&Development,UNIX, Windows,Lotus,SmartSuite,DataEntry,Softwaresknowledge,NetworkingPlatforms,applic ationsofcomputersinInstrumentation/Electricalengineering

UnitandMeasurement:

Definition, Classification, Fundamental and derived units, systems of units: FPS, CGS, MKS,Unitofphysicalquantities,symbols,Conversionfactors,Measurementsofmechanicalq uantities,electricalquantities.

MassWeight andDensity

Definition, Comparison between mass and weight, Comparison between density and relativedensity/specific gravity, Volume of different geometries (Cube, Cylinder, Cone Sphere etc.),RelatedProblems

WorkPowerand Energy

Definition, Workanditsunits, Measurementsof Work, Workdoneonbodies moving on horizonta I and inclined planes (Consider frictional forces also) Concept of Power and its units, Calculationsof Power (Simplecases), Conceptof Kineticenergy and potential energy, Ex pressions for P.Eand K.E, Principle of Conversion of Energy.

Speedand Velocity

Definitionofspeed,velocity,andtheircomparison,ScalarandVectorquantity,AverageVelocit y, Acceleration and Retardation, Equations of Motion, Circular Motion: Relation betweencircular and linearmotion.

HeatandTemperature

Definition, Specific heat and thermal capacity, Types ofheat:Sensible Heat,Latent Heat,Differencebetweenheatandtemperature,Differenttemperaturescalesandconversions ,Temperaturemeasuringinstruments:RTD,Thermistors,Thermometer,Pyrometer,andTher mocouple.

BasicElectricalandInstrumentation

DCandACcurrents/Voltage,Resistanceandtheircombinationalcircuit,ColorcodingofResist ance,WiringDiagramofdomesticandelectriccircuit,self-

inductance(L),Mutualinductance(M),Inductors,Typesofcapacitor,charge,andenergystore dincapacitors,Electrical Terms and Units, Ohm's Law, Kirchhoff's law, relationships between Current, volt,resistance, and Power, resistance connections, Series and Parallel connections, Insulators,Properties and Classifications,Conductors:Properties andClassifications,Semiconductors:propertiesandclassifications,ElectricalPower,Introdu ctionofACandDCgenerators,

Faraday'sLaw,Lenz'sLaw,Fleming'sleftHandandrighthandrules,basicsensorsandtransducers, Troubleshooting and installation.

BasicElectronics:

Semiconductors, Diode, PN and NP diode, Zener diode, Voltage regulators, BJT, Logic Gate, Analoganddigital Multimeter, CRO.

OccupationalSafetyand Health

Safety and Health, Introduction and importance of occupational safety and Health, OccupationalHazards:BasicHazards,ChemicalHazards,Vibro-

acousticHazards,MechanicalHazards,Electrical Hazards, Thermal Hazards, Occupational Health, Accident and Safety; First Aid: Careof injured and Sick at the work places, Basic provision: Idea of basic provision of safety, health,welfareunderlegislationofIndia.

EnvironmentEducation:

Ecosystem: Introduction to Environment, Ecosystem and factors causing imbalance, PollutionandPollutantsincludingLiquidgaseousandhazardouswaste,EnergyConservation:Cons ervation ofEnergy, Re-use and re-cycle, Global Warming: Climate change and Ozonelayer depletion, Ground water, Hydrological cycle, ground and surface water, conservation andharvesting of water, Environment: Right attitude towards environment, Maintenance of inhouseenvironment.

IT Literacy

Computer: Introduction, Computer and its applications, Hardware and peripherals, Switching onandShuttingdownofcomputers,WINDOWS,BasicofOS,WNIDOWS,Create,copy,moveand delete files and folders, Use ofExternal Memory, MS Office, MS-Excel, Internets surfingandits use,Informationsecurity,Antivirustools,AwarenessofIT Act,Types ofCyber-crime.