



CSIR-CENTRAL SCIENTIFIC INSTRUMENTS ORGANISATION

(Council of Scientific & Industrial Research)

SECTOR-30-C, CHANDIGARH-160 030

www.csio.res.in

Web Notification

No. CSIO/2(289)/2015-R&A/1

Dated: 25.01.2017

Syllabus of written (Trade/Skill) test for recruitment of Technical Assistant (Mechanical), total 04 posts advertised vide CSIR-CSIO advt. No.5/2013 and 4 posts advertised vide advt. no. 02/2016-reg.

The syllabus for forthcoming written examination is displayed for information of all concerned. The weightage of Part-A of the syllabus will be 80(Eighty) % and part-B will be of 20 (Twenty)%. There will be negative marking also for wrong answers @ 25%. Based on the performance in written examination, the merit list will be drawn and cut off marks will be fixed, to be further called for documents verification. Final Selection will be based on the performance in written test only and there will be no component of interview as already communicated. The written (Trade/Skill) test is likely to held in 3rd/4th week of February, 2016 at Chandigarh. The exact date of written examination will be uploaded on our website in due course and shortlisted candidates will be able to download the admit card thereafter.

Administrative Officer

PART - A

MECHANICAL STREAM:

Unit -1

ENGINEERING DRAWING : Fundamentals of engineering drawing, first & third angle projections, orthographic & Isometric projections, Representation of threads, sections, Dimensioning, Tolerances and fits, viz. Basic hole/shaft system, surface finish, standard deviations, development of sheet metal parts, Cams.

Unit -2

WORKSHOP TECHNOLOGY : Measurement tools viz. vernier caliper, micrometers, bevel protractor, etc. Cutting tools viz. drill, reamer, Cemented Carbides, hand tools etc. Machines: Drilling, Lathe, Shaper, Milling, grinding, broaching, honing, lapping, hobbing, Planer and Slotting, Jig Boring and Jig Grinding. Arc and gas welding, soldering and brazing, Power transmission elements: shafts, bearings, belt and gear drives, clutches etc. Non- conventional machining viz. Ultrasonic machining, electrical discharge machining, Wire EDM, tool wear.

Unit -3

ENGINEERING MATERIALS: Composition, properties and uses of pig iron, chilled cast iron, malleable cast iron, wrought iron, low, medium and high carbon steels. Iron-carbon diagram. Alloy steels, free cutting steels, HSS, spring steels, high tensile steels, magnet steels, tool and die steels, and cemented carbides. Properties and uses of Alloys of Copper, Tin, Zinc, Aluminum, Nickel and Magnesium. Corrosion of metals and their protection. Heat Treatment viz. annealing, hardening & tempering, hardness testing.

Unit -4

ENGINEERING MECHANICS : Force system & types viz. concurrent force, parallel, non-concurrent, non-parallel forces, Conditions of equilibrium, analysis of plain trusses and cables. Centre of Gravity, Moment of Inertia. Static and dynamic friction, Simple machines; Lifting machines, simple wheel and axle, wheel and differential axle, system of pulleys, screw jack. Kinetics of rectilinear, curvilinear and rotational translation, centrifugal force.

Unit -5

CAD/ CAM : Introduction. Fundamentals of CAD/CAM & applications, Benefits of CAD. CIM Systems viz. NC, CNC, DNC & AC systems, Principle & working of CNC machines & part programming, Types of manufacturing systems, FMS, SFC, GT, CAPP, CAQC, IM and MRP, Material handling system, Industrial Robotics viz. Robot Drives, End Effectors, Robot sensors.

Unit -6

STRENGTH OF MATERIALS : Stress and strain, properties of metals, Poisson's ratio. Bending moment and shearing force, longitudinal stresses in beams, torsion, springs, riveted joints, columns and shafts.

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Unit -7

MOULD TECHNOLOGY: Injection & compression moulding, Main parts viz. runners, gates, parting lines, ejection, ejector return mechanism, undercuts, sliders, Mould cooling & heating, tool location and guide systems, ventilation in moulds, types of moulds viz. flash mould, semi positive mould, positive mould, inverted moulds, group moulds, transfer moulds.

Unit -8

TOOL & DIES : Tool types and nomenclature, Basic construction and action of cutting/shearing, angular clearance, stripping, cutting force. Fundamentals and design of Die types viz. blanking & fine blanking dies, inverted dies, progressive dies, compound dies, bending dies, drawing & deep drawing dies, Casting dies, gravity casting, Pressure die casting, main parts of die viz. parting line, runners, gates, vents, ejectors, cores, Punch types.

Unit -9

JIGS AND FIXTURES : Fundamentals and principles of locating devices and clamping devices, jigs & fixtures for milling, turning, grinding, broaching, drilling etc., indexing jigs and fixtures.

Unit -10

PRODUCTION PLANNING: Work study & Time study viz. time recording & calculations, motion study, Machine layout, production types. Costings viz. material cost, fixed and variable costs, overheads, selling cost, profit, break even analysis, Production scheduling. Network analysis & techniques viz. PERT & CPM, activity time calculations, GANTT Charts.

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PART-B

- **General Aptitude/Trade Test:** Questions will be of Objective type with negative marking . This part of examination will have 20(twenty) % weightage.

Administrative Officer