



सी एस आई आर- केन्द्रीय यांत्रिक अभियांत्रिकी अनुसंधान संस्थान

CSIR-CENTRAL MECHANICAL ENGINEERING RESEARCH INSTITUTE

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद् / Council of Scientific & Industrial Research

दुर्गापुर / Durgapur - 713 209

संख्या/No. 5/92/2016(4)-Rct.

दिनांक/ Dated : 12.09.2019

सूचना / NOTICE

In continuation of this Institute's Notice dated 06.12.2018, 18.02.2019 and 14.05.2019, this is for information of all concerned that the applicants, found provisionally eligible will have to appear for a **Trade Test** in their respective trade(s). The **Trade Test** is a qualifying in nature to shortlist candidates for the Written Competitive Examination. The final merit list will be drawn as per the performance of the candidates in the Written Competitive Examination.

1. The Syllabus for **Trade Test** for the respective trades are attached with this notice as **Annexure-A**. Schedule and Venue of the Trade Test for each of the trades and further instructions to the candidates in this regard will be notified shortly.

2. The Scheme for the **Written Competitive Examination** is attached with this notice as **Annexure-B**. The details in this regard will be notified in due course.

3. One candidate Mr. Bijoy Kumar under Post Code 180205 bearing Application No. 180205_1005 is found to be ineligible, being overaged. As such his name from list of provisionally eligible candidates under Post Code 180205 is dropped and his candidature is cancelled.

4. All further information regarding this recruitment drive will be notified only on the Institute official website i.e. www.cmeri.res.in. As such, the candidates are advised to visit the site regularly.

Hindi version follows.

(जय शंकर शरण/J. S. Sharan)

प्रशासनिक अधिकारी/ Administrative Officer

Encl.: As above

Copy to:

1. All Notice Boards
2. Head IT : For publication of the notice in the Instt. website.
3. Hindi Cell
4. Officer copy

Syllabus of Trade Test for the Post of Technician-I [Group-II]**Name of the Trade :- Draughtsman**

1. Construct different Geometrical figures using drawing Instruments.
2. Draw Orthographic Projections giving proper dimensioning with title block using appropriate line type and scale.
3. Construct free hand sketches of simple machine parts with correct proportions.
4. Construct plain scale, comparative scale, diagonal scale and vernier Scale.
5. Draw sectional views showing orthographic projections.
6. Develop surface and interpenetration of solid in orthographic projection.
7. Draw isometric projection from orthographic views (and vice-versa) and draw oblique projection from orthographic views.
8. Draw and indicate the specification of different types of fasteners, welds and locking devices as per SP-46:2003.
9. Construct different types of gears, couplings and bearings with tolerance dimension and indicating surface finish symbol.
10. Perform computer application and create 2D objects on CAD drawing space using commands from ribbon, menu bar, toolbars and by typing in command prompt.
11. Construct projection views of geometrical figures with dimension and annotation on CAD in model space and viewport in layout space.
12. Draw in CAD detail and assembly Drawing of machine parts viz., Pulleys, Pipe fittings, Gears and Cams applying range of cognitive and practical skills.
13. Create 3D solid by switching to 3D modelling workspace in CAD, generate views, Print Preview and Plotting.
14. Construct detailed and assembled drawing applying conventional sign & symbols using CAD.
15. Prepare drawing of machine part by measuring with gauges and measuring instruments.
16. Create and plot assembly and detail views of machine part with Dimensions, Annotations, Title Block and Bill of materials in Solid Works/AutoCAD Inventor/ 3D Modelling.

Name of the Trade :- Fitter

1. Plan and organize the work to make job as per specification applying different types of basic fitting operation and check for dimensional accuracy
2. Manufacture simple sheet metal items as per drawing and join them by soldering, brazing and riveting.
3. Join metal component by arc welding observing standard procedure.
4. Join metal components by riveting observing standard procedure.
5. Produce components by different operations and check accuracy using appropriate measuring instruments
6. Make different fit of components for assembling as per required tolerance observing principle of interchange ability and check for functionality
7. Produce components involving different operations on lathe observing standard procedure and check for accuracy.
8. Plan & perform simple repair, overhauling of different machines and check for functionality
9. Make & assemble components of different mating surfaces as per required tolerance by different surface finishing operations using different fastening components, tools and check functionality.
10. Make different gauges by using standard tools & equipment and checks for specified accuracy.
11. Apply a range of skills to execute pipe joints, dismantle and assemble valves & fittings with pipes and test for leakages
12. Make drill jig & produce components on drill machine by using jigs and check for correctness.
13. Plan, dismantle, repair and assemble different damaged mechanical components used for power transmission & check functionality

Name of the Trade :- Machinist

1. Planning and organizing the work to make job as per specification applying different types of basic fitting operation and check for dimensional accuracy
2. Producing components by different operations and checking accuracy using appropriate measuring instruments Setting the different machining parameters to produce metric-v and square-v threaded components
3. Setting different machining parameters and cutters to prepare job by performing different milling operation and indexing
4. Producing components of high accuracy by different operations using grinding.
5. Producing Rack, Spur Gear, External Spline, Steel Rule, Clutch, Helical Gear, Bevel gear, worm & worm wheel in a milling machine
6. Basic maintenance of milling, grinding and drilling machines
7. Setting CNC VMC (vertical machining centre) and producing components as per drawing by preparing part programme

Name of the Trade:- Motor Mechanic / Diesel Mechanic / Driver cum Mechanic / Mechanic (Tractor)

1. Introduction of engine, Classification of engine: Petrol, Diesel, Marine etc.
2. Main parts of engine: Cylinder block, Cylinder, Cylinder liner, Cylinder head, Cylinder head gasket, piston, piston ring, Connecting rod, piston pin/gudgeon pin, crank shaft, cam shaft, flywheel, valve actuating mechanism, manifold (intake and exhaust)
3. Dismantle and assembly of engine with other accessories, Overhaul and service of engine, its parts and functioning.
4. Trace, test and repair cooling system of engine; Trace, test and repair lubrication system of engine; Trace & test intake and exhaust of engine.
5. Servicing of fuel feed system, Servicing of fuel injection system and its accessories.
6. Plan and overhaul the stationary engine and Governor and check functionality.
7. Auto electricity: Alternator, battery, starter motor and hydrometer/multi meter. Carryout overhauling of Alternator and Starter Motor

Name of the Trade :- Plumber

- 1 Inner & Outer Thread cutting on Metal & Studs and thread cutting on different types of pipes & fittings accessories.
- 2 Cutting Pipes of Different Dia in different angle and Joining of pipes by gas welding, Soldering and Brazing.
- 3 Brick wall cutting for concealing pipe line.
- 4 Cutting and Bending of Pipes using Plumber's tools and equipments.
- 5 Make complete pipe line circuit with different types of Joints and fixing Cocks & valve on Pipe line.
- 6 Cutting of Different Types of PVC Pipe, joining and laying.
- 7 Perform Water analysis test, Water Pressure test and Water distribution system by using pipe line.
- 8 Installation and maintenance of different Electric pump.
- 9 Removal of leakage pipe line.
- 10 Installation & maintenance of water meter and water supply for fixture.
- 11 Fitting and maintenance of Fixture at different place.
- 12 Fitting, fixing & laying installation of hot & cold water pipe line and symboling.
- 13 Repairing & reconditioning of waste pipe line.

Name of the Trade :- Sheet Metal Worker

1. Selection of sheet of required type, thickness (gauge) and size and marking it with scribe, square, divider, steel rule etc., according to drawing or sample
2. Shearing and bending of sheet wherever necessary by machine or hand shear
3. Forming sheet metal to required shape and size by bending, seaming, forming, riveting etc., using mallets, hammers, formers, sets, stakes, etc., or by various operations such as shearing, bending, beading, channelling, circle cutting
4. Performing soldering and brazing operations on sheet metal
5. Making ducts, cabins & panels
6. Aluminium frame works

Name of the Trade :- Turner

1. Planning and organizing the work to make job as per specification applying different types of basic fitting operations & checking for dimensional accuracy [*Basic Fitting Operation – Marking, Hack sawing, filing, drilling, tapping etc.*]
2. Setting different shaped jobs on different chuck to demonstrate conventional lathe machine operation observing standard operation practice [*Different chucks: - 3 jaws & 4 jaws, different shaped jobs: - round, hexagonal, square*]
3. Producing jobs to appropriate accuracy by performing different turning operations [*Different cutting tool – V tool, side cutting, parting, thread cutting (both LH & RH), Appropriate accuracy: - $\pm 0.06\text{mm}$, Different turning operation – Plain, facing, drilling, boring (counter & stepped), grooving, Parallel Turning, Step Turning, parting, chamfering, U-cut, Reaming, internal recess, knurling.*]
4. Testing of alignment of lathe by checking different parameters and adjusting the tool post [*Different parameters – Axial slip of main spindle, true running of head stock, parallelism of main spindle, alignment of both the centres.*]
5. Setting different components of machine & parameters to produce taper/ angular components [*Different component of machine: - Form tool, Compound slide, tail stock offset, taper turning attachment. Different machine parameters- Feed, speed, depth of cut.*]
6. Setting of different machining parameters to produce different threaded components applying method/ technique and test for proper assembly of the components. [*Different thread: - BSW, Metric, Square, ACME, Buttress.*]
7. Performing basic maintenance of lathe
8. Setting & Producing components on irregular shaped job using different lathe accessories [*Different Lathe accessories: - Face plate, angle plate*]
9. Setting the machining parameters and producing components by performing different boring operations with an appropriate accuracy. [*Different boring operation – eccentric boring, stepped boring; appropriate accuracy - $\pm 0.05\text{ mm}$*]
10. Setting (both job and tool) CNC turning centre and producing components as per drawing by preparing part programme

Name of the Trade :- Welder

1. Edge preparation for welding of MS plates in different positions viz. 1F, 2F, 3F, 1G, 2G and 3G as designated by American Welding Society (https://app.aws.org/forum/topic_show.pl?tid=22625) observing standard procedure
2. Setting of gas welding plant and subsequent welding of MS plates in different positions viz. 1F, 2F, 3F, 1G, 2G and 3G observing standard procedure
3. Setting of SMAW machine and subsequent welding of MS plates in different positions viz. 1F, 2F, 3F, 1G, 2G and 3G observing standard procedure
4. Setting of SMAW machine and subsequent welding of MS pipe in joint configurations viz. Butt, Elbow, T-joint, angle (45°) joint and flange joint observing standard procedure
5. Setting of Oxy-acetylene cutting plant and perform different cutting operations on MS plate viz. Straight, Bevel and Circular cutting observing standard procedure
6. Setting of GMAW machine and subsequent welding of MS plates in different positions viz. 1F, 2F, 3F, 1G, 2G and 3G observing standard procedure
7. Setting of GTAW machine and subsequent welding of aluminium and stainless plates in different positions viz. 1F and 1G observing standard procedure
8. Setting of resistance spot welding machine and subsequent welding of sheets of stainless steel and MS.
9. Perform joining of different similar and dissimilar metals (viz. copper, MS and SS) by brazing operation as per standard procedure.

Name of the Trade: Electrical (Electrician)

The trade test syllabus on the broader topics is given below:

a) Electronics Circuit

1. Identification of connection, terminals, Characterization and testing of transistors, thyristor and diodes.
2. Testing of active and passive electronic components.
3. Practice on half wave circuit, full wave circuit, bridge rectifier circuit and filter circuit
4. Operation for equipment like Function generator, C.R.O, LCR meter etc.
5. Analysis of different wave shapes using C.R.O.
6. Assembly of control cabinets and equipment and its operation and maintenance.
7. Troubleshooting of power supplies, voltage stabilizers, UPS, electrical machines and control equipment.
8. Assembly and testing of a single stage amplifier, types of wave shapes & cascade amplifier, Power amplifier, use of standard I.C Amplifier.

b) Electrical Machines

1. Practice of testing and maintenance of transformer: Terminal and accessories identifications, characterization, voltage regulations, power factor of single and three phase transformers, its operation and maintenance.
2. Practice on connection of single and three phase motors, identification, testing, running, and reversing.
3. Measurement of slip, Power Factor of Induction motor at various loads, practice on connection of D.O.L starter, Star-Delta starter, Auto transformer starter, and starting, running.
4. Starting, running and building up voltage, loading and maintenance of Motor-Generator set.
5. Installation and precautions of common electric machines like transformers, induction motors, DC/AC motors, generators/alternators etc.

c) Power System and Protections

1. Practice on installation of conduit pipe wiring for lighting and power circuits for both 230 V & 400V.
2. Impregnation, Varnishing and Testing for faults
3. Wiring of control cabinet as per wiring diagram, channeling, tying, checking, mounting of various control elements like circuit breakers, MCBs, protective and control relays, contactors and timers, operation and use of cables like XLPE etc.
4. Practice in wiring and in maintenance of workshop, institute, hostel and residential building and its fault finding practice.

5. Phase sequence and Neutral terminal identification in 3phase/ single phase Wire System.
6. Practice on installation and overhauling common electrocution accessories, Fixing of switch holder plugs etc. in T. W. boards, Identification and use of wiring accessories
7. Practice on re-winding and assembly of different electrical appliances, its maintenance and repair.

d) Electrical Wiring, Lightening and Earthing

1. Electric wirings, I.E.E. rules, specifications for wiring, grading of cables and current ratings.
2. Practice on wiring-testing by meggar, using casing capping, P.V.C., concealed system, distribution box, switch, main box, Maintenance & Repairing for conduits & accessories.
3. Practice on Earthing using different methods, and importance of Earthing.
4. Light fitting with reflectors, installation of various lamps like tube, CFL, mercury, sodium vapor, halogen lamps, flood light etc.

e) Measurements Instruments

1. Instruments in single and three phase circuits e.g. Multi-meter, Wattmeter, Energy meter, Phase sequence meter, Frequency meter, Tong tester, C.R.O., DMM, Ammeters, Voltmeters etc.
2. Behavior of R , X_L & X_C in A.C. circuits both in Series and in Parallel.
3. Current, Voltage, Power and Energy Measurement in single and poly phase circuits.

f) Characteristics of Electrical Circuits and Magnetic Circuit

1. Experiments like, Ohm's law verification, wheat-stone bridge, galvanometer, voltage drop method, Temperature effect on the resistance, series and shunt/parallel circuit, resistance measurement.
2. Tracing the B-H Curve & Hysteresis loop.
3. Identification of different types of capacitors. Charging & discharging of capacitor, testing of capacitors using DC voltage and lamp.
4. Installation, Operation, charging, testing and maintenance of batteries, filling of electrolytes etc.: Assembly of Dry cell-Electrodes-Electrolytes, Grouping of Dry cells for a specified voltage and current, Ni cadmium & Lithium cell. Practice on Battery Charging, Preparation of battery charging, testing of cells, Installation of batteries, and charging of batteries by different methods.
5. Types of wires as cables standard wire gauge classification of wires and cable insulations & voltage grades.

6. Practice on installation and overhauling common electrocution accessories, Fixing of switch holder plugs etc. in T. W. boards, Identification and use of wiring accessories.

g) General safety, Tool handling, Soldering and Drilling operation

1. Safe Working Practice: Demonstration on elementary first aid. Artificial Respiration.
2. Safe methods of fire fighting in case of electrical fire. Operation of Fire extinguisher.
3. Tools Handling: Identification, maintenance safety and precautions during handling trade tools, machineries, hand tools like clampers, wire cutters, pliers, screw drives, tester, files, hammers, chisels, hacksaw frames, blades and steel rule try square etc.
4. Joints and Soldering: Cutting and joining practice of wire, crimping thimbles, lugs, making holes, screwing and riveting, drilling, chipping etc.
5. Soldering techniques, soldering of joints, on PCB, wires, through hole etc.
6. Drilling operation: Types of drills description & drilling machines, proper use, care and maintenance, description of taps & dies, types in rivets & riveted joints, Use of thread gauge.
7. Practice of marking & cutting tools such as snubs shears punches & other tools like hammers, mallets etc.

[CSIR letter No. 5-1(315)/2015-PD dated 09.04.2018]

Annexure-VI**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>

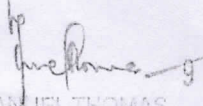
*Mental Ability Test will be so devised so as to include General Intelligence, Quantitative Aptitude, Reasoning, Problem Solving, Situational Judgement, etc.

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


MANUEL THOMAS
Sr. Dy. Secretary
9 APR 2018