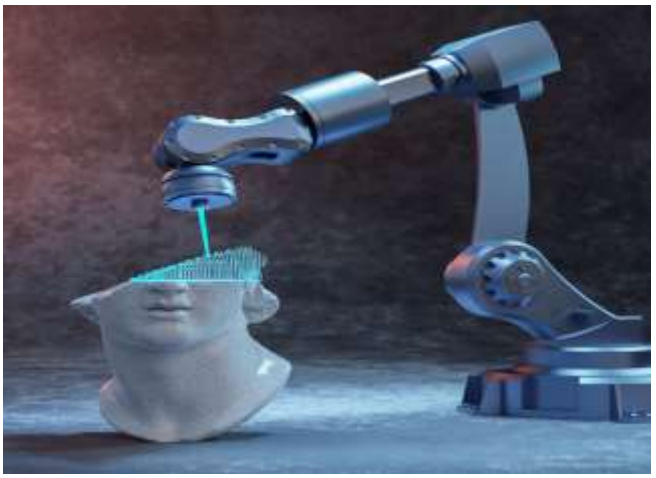
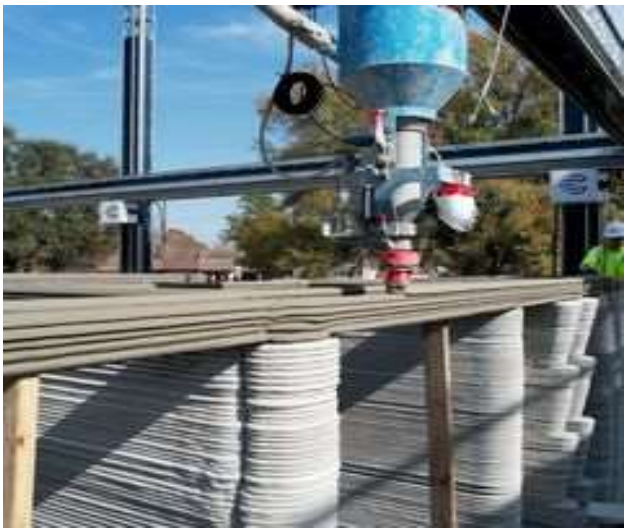
SPECIFICATION FOR

Additive Manufacturing Technician(3D Printing)



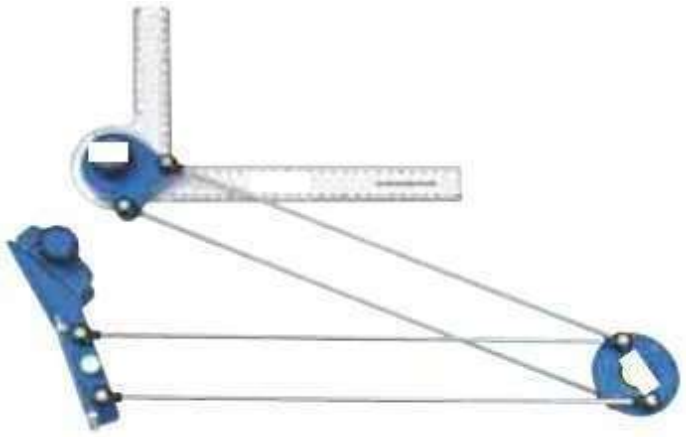


Contents

1. Mini drafter, Tweezers, Gloves, Goggles, Scrapers

A. Mini Drafter

1. Basic indicative diagram



2. Trimmed Size: 420 mm x 594 mm
3. Sturdy
4. Light Weight
5. Chrome Plated Bright Bar Protects against Corrosion
6. Easy Readability of Scale
7. Stainless Steel Clamp
8. Better Grip
9. Suitable for Drawing Board of Size: 72 cm and A2 Size Sheet
10. Untrimmed Size: Minimum - 450 mm x 625 mm
11. Packed in canvas cover
12. Good Handy Portable Packing

B. Tweezers,

1. Basic Indicative Diagram

2. **Total Length: 150 mm** ± 1 mm
3. Total Width. 9.3 mm ± 0.1 mm
4. Total thickness: 1.2 mm ± 0.05 mm
5. Material Stainless Steel
6. Hardness: 40 - 42 HRC
7. Should be useful for beading and many aspects of electrical work repair.
8. Should insulated
9. Material - Stainless steel
10. Contains from 16.5 to 18.5 wt% chromium and has important quantities of nickel and molybdenum as additional alloying elements.
11. Non-magnetisable. Good corrosion resistance and toughness are primary requirements. Typical applications include tools and equipment for laboratory
12. Thermal Properties: Coef of line thermal expansion 16.0 E-6/degrees C 20-100 degrees C Coef of in thermal expansion 17.0 E-6/ degrees C 20-300 degrees C
13. Specific heat capacity: 0.50J (g.K)
14. Thermal conductivity: 15W/m.K)
15. Continuous use temperature: 300 degrees C Max service temperature, air 825 degrees C
16. Electrical Properties Resistivity: 0.75 E-4 ohm.cm

C. Gloves,

1. Basic Indicative Diagram

2. Abrasion resistance
3. Blade Cut Resistance
4. Tear Resistance
5. Puncture Resistance

1. D. Goggles

1. Basic Indicative Diagram

2. Material – Polycarbonate Protects From Chemical Splashes,
3. Lens- Transparent clear lens
4. High resistance to impact from flying particles, Protects From Chemical Splashes,
5. Elastic Headband: Polyester Covered Rubber Thread

E. Scrapers

1. Basic Indicative Diagram

2. Blade width 50 mm
3. Stainless steel blade
4. Ergonomic durable handle
5. Safety Edges

2. Steel Rule Graduated both in Metric and English Unit 300 mm with precision of 1/4th mm

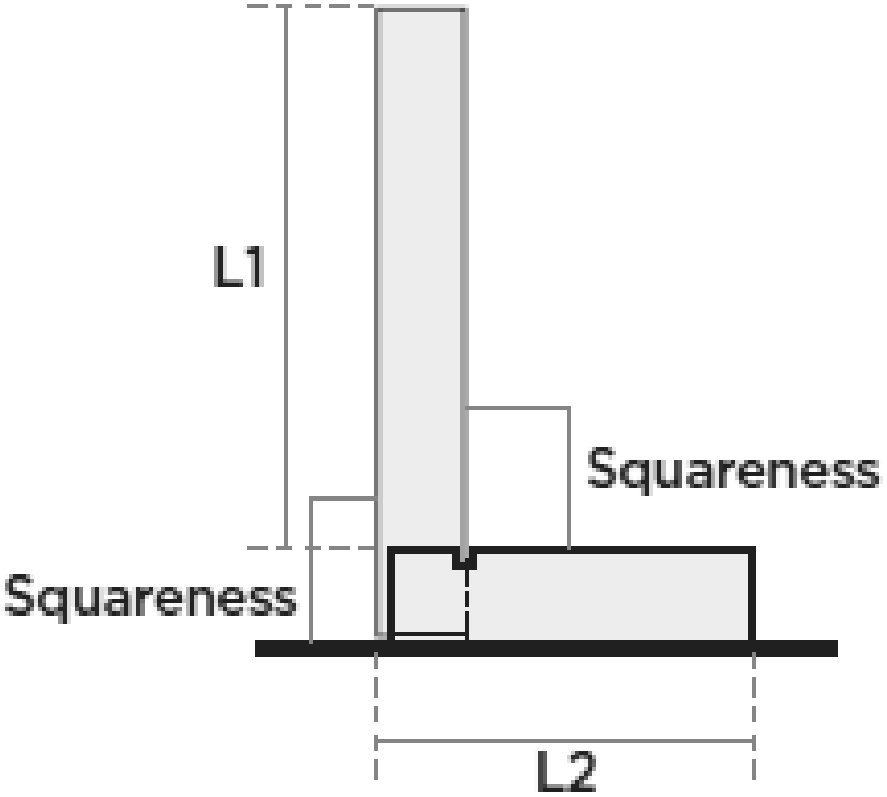
As Per DVET, Maharashtra State , SPECIFICATION FOR MECHANICAL MEASURING EQUIPMENTS GROUP ITEMS - Version 3--2018-19 -Sr. No -32 Page no 35&
As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.11 Pg. No. 20

1. Basic Indicative Diagram

1. Range: 300 mm
2. Material: Stainless Steel
3. Thickness: 0.5 mm
4. Hardness: 30 - 35 HRC (Specially Hardened)
5. Finish: Polished 2B / Anti-Glare Satin Chrome
6. Surface roughness: 0.6 Microns max
7. Measuring least count: Metric Graduation +0.5 mm and English graduation 1 /64 inch
8. Accuracy: Metrology Standard EEC Class - I

3. Try Square 10 cm blade

1. Basic Indicative Diagram

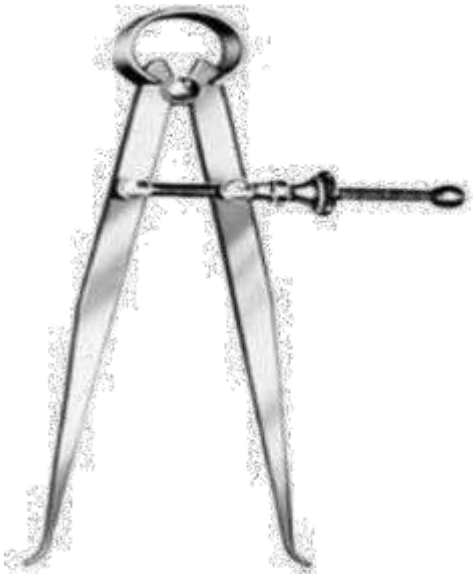


2. Blade length(L1): 100mm
3. Squareness: 16microns
4. Material for Blade: Spring Steel hardened blade
5. Stock: Steel
6. Hardness of Blade: 40-50 HRC
7. Groove on the inner corner of the stock
8. The blade is fixed to the stock by taper pins.
9. All faces are precision ground.
10. All Squares are ground to ensure they are straight and parallel.
11. The Beam is grooved at the inside Corner for Clear Clearance of Saw Dust or dirt.

4. Caliper inside spring type 15 cm

As Per DVET, Maharashtra State, SPECIFICATION FOR MECHANICAL MEASURINGEQUIPMENTS GROUP ITEMS - Version 3--2018-19 -Sr. No -1 Page no 4 &
As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.35 Pg. No. 44

1. Basic Indicative Diagram

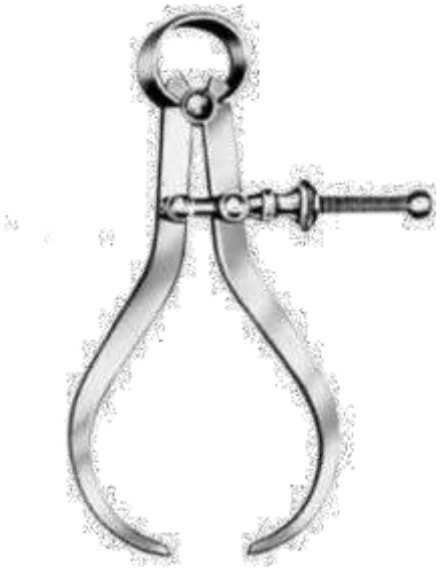


2. inside calipers with Size: 150 mm
3. Material for
    i. Legs: Carbon & Alloy Steel
    ii. Spring: Spring Steel
    iii. Others: Free Cutting Steel
4. Finish for
    i. Legs: Polished
    ii. Rest parts: Auto Black
5. Hardness for
    - Tip: 50 - 55 HRC
    - spring: 45 - 50 HRC
6. Proper rust preventive packing

5. Caliper outside spring type-150MM

As Per DVET, Maharashtra State, SPECIFICATION FOR MECHANICAL MEASURING EQUIPMENTS GROUP ITEMS - Version 3--2018-19 -Sr. No -2 Page no 5 & As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.34 Pg. No. 43

1. Basic Indicative Diagram

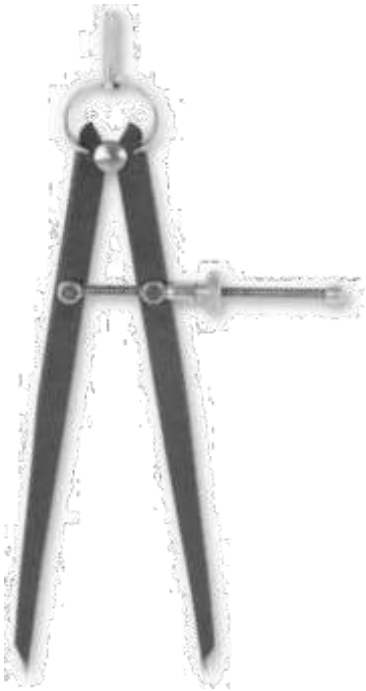


2. Legs: Carbon & Alloy Steel
3. Spring: Spring Steel
4. Others: Free Cutting Steel
5. Finish for
6. Legs: Polished
7. Rest parts: Auto Black
8. Hardness for
9. Tip: 50 - 55 HRC
10. Spring: 45 - 50 HRC
11. Proper rust preventive packing

6. Divider spring type-150 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR MECHANICAL MEASURING EQUIPMENTS GROUP ITEMS - Version 3--2018-19 -Sr. No -3 Page no 6 & As Per DVET, Maharashtra State SPECIFICATION FOR ELECTRICIAN Sl No -36 Page no 45

1. Basic Indicative Diagram



2. Spring Divider Size(L): 150 mm
3. Material for
4. Legs: Carbon & Alloy Steel
5. Spring: Spring Steel
6. Others: Free Cutting Steel
7. Finish for
8. Legs: Polished
9. Rest parts: Auto Black
10. Hardness for
11. Tip: 50 - 55 HRC
12. Spring: 45 - 50 HRC
13. Proper rust preventive packing

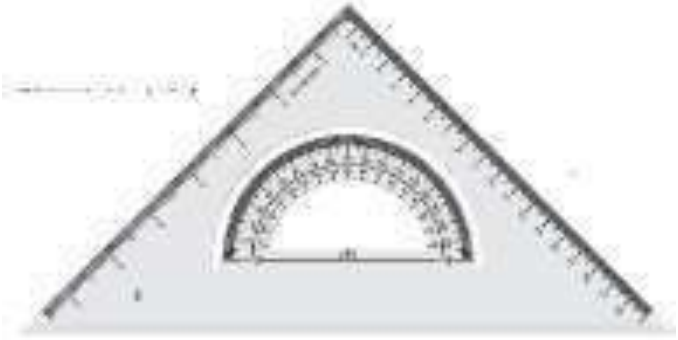
7. Draughtsman drawing instrument box

1. Basic Indicative Diagram

2. Draughtsman drawing instrument box containing:
    a. Compasses with pencil point,
    b. Point driver interchangeable
    c. Divider pen point interchangeable,
    d. Divider
    e. Springbow pen,
    f. Spring bow lengthening bar,
    g. Pen drawing liner,
    h. Screw driver Instrument,
    i. Tube with lead.

8. Celluloid Set Square - 45 Degree,

1. Basic Indicative Diagram



2. Size :250mm
3. Angle :45Degree
4. Thickness :1.5(± 5%)mm
5. Should be supplied with Side Marking bevel edge with protractor Engraved Marking

9. Celluloid Set Square - 60°C

1. Basic Indicative Diagram

2. Size : 250mm
3. Angle : 30 / 60 Degree
4. Thickness : 1.5 (± 5%)mm
5. Should be supplied with Side Marking Bevel edge Engraved Marking

10. Celluloid French Curve Set - Set of 12

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.4 Pg. No. 6

1. Basic Indicative Diagram

1. Should have in king edge
2. Material: Transparent plastics
3. Size: 170 x 70 x 2 mm(±5%)
4. Shapes: As indicated in above diagram

11. Drawing Board – with Stand 700mm x500 mm IS: 1444

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.6 Pg. No. 8 & Item No. 8 Pg. No. 13

11A. Drawing Board

1. Basic Indicative Diagram:

2. This specification for Drawing Board - Engineers Pattern is based on BIS 1444 - 1989.The drawing board size is in the range of sizes suitable for use with the IS0'A'range of trimmed paper sand IS10711: 1983'Sizes of drawing sheets'.
3. **Dimension**: D1'size 920x650 mm with tolerance on length/width of ±5mm, thickness 22mm, tolerance on thickness of ±1mm, Tolerance onStraightness of Working Edge 0.25mm Recommended for Use with Sheet of'A1'size
4. **Material:**

   Timber: (see IS 399 :1963).

   11.6 Working Surface: Ben teak, Blue pine, Fir, Cypress, Oak, Red cedar.

   11.7 Battens: Aini, Anjan, Bijasal, Black chuglam, Padauk, Safed siris, Salai, Sissoo, Teak, Walnut.

   The wood used shall be thoroughly seasoned and shall have attained a moisture content of not more than 12 percent, which may be 14 percent in the case of teak (seeIS287:1973).

   It shall be free from knots, cracks, sap, shakes and other defects.
5. **Adhesive**: The adhesive used and bonding shall conform to BWR or WWR Grades of IS 848:1974.
6. **Lipping:** The timber for lipping shall be fine-grained hard wood from the species of timber given under Class I of Appendix a of IS 303: 1975. Lipping shall be done externally on all exposed edges of the block board to a maximum width of 10 mm and shall be joined by adhesive.
7. **Edge**: The working edge shall be well seasoned, fine grained hardwood, such as ebony or rosewood (Dalbergia latifoliaRoxb.), or of aluminium or plastic. Where plastics material is used it shall be of sheet form, complying with following requirements :a) The material shall be homogeneous,
8. **Washers:** The washers with slots shall be made of rolled brass sheet (see IS 410: 1977); or copper sheet, and shall be1'7 to 2'0 mm in thickness. The wood screws used s h a l l be of brass (see IS 6760:1972).
9. **Construction:**
   a. Working Surface: The boards shall have a smooth and true working surface. They shall not twist or bow by more than 1 mm.
   b. When a steel straight edge, 1 m long and complying with the requirements ofIS 2233 : 1962, is placed on a working surface, the surface shall not deviate from the straight edge by more than 1.5 mm, irrespective of the position of the straightedge on the surface.

c. Working Edge: A true working edge shall be provided by the insertion of a suitablestrip which shall be securely glued to the working end of the board. The dimensionsand position of the strip shall be as specified in IS 1444: 1989. Opposite edges shall be parallel within a tolerance of ±0.5 mm over each1'0m length of working edge. When a steel straight edge, complying with the requirements of IS2233:1962, is placed along a working edge, that edge shall not deviate from the straight edge by more than 0.25mm over each 1m length of the working edge.

d. Battens: Two battens smoothly finished and with chamfered or rounded edges shallbe fitted to the back of the board.

5. **Finish:** The edges of the board shall be coated with two coats of approved varnish.
6. **Marking:** Each board shall be clearly and legibly marked on the back with the manufacturer's name or trademark and also the year of manufacture.
7. **Packing:-** In the absence of any specific agreement as to the mode of packing each board shall be properly protected to prevent damage of the working edge in transit and in storage. Conforming to BIS 1444:1989.Manufacturing Process:
8. The complete unit shall be as per manufacturer's specifications and Flow chart of manufacturing process shall be submitted along with the tender.
9. Raw materials (Wood working): 1) Plain Particle Board (PPB), 2) Medium Density Fiber Board (MDF), 3) Pre-laminate Board (PLB), 4) Decorative Laminate (DL), 5) Fabric and 6) Lipping (PVC lipping).
10. Process(Woodworking):MDF board from approved supplier->Wood Cutting (cuttingfrom mother board 600mm x 2400mm sheet to the desired size on Panel saw machine with no sharp edges, no glue marks, no scratches, no machine marks and no cracks at drill hole) -> Lamination (Hot lamination adhering Decorative laminate to MDF board using approved make adhesive)
11. -> Sizing/ Routing (fine sizing and setting curvilinear shapes) -> Lipping/ Edge banding (adhering PVC lipping on MDF board using hot melt glue under heatand pressure) -> Finishing -> Assembly and Packaging (carcase/ panel assembly, final inspection/ correction if required, packing and dispatch).
12. Raw materials (Metal working): 1) Stainless Steel (Nickel and Chromium added to prevent steel from rusting), 2) Mild steel and 3) Epoxy polyester powder (for powder coating).
13. Size and Weight:
    a. Overall Length: 920mm
    b. Overall Width: 650mm
    c. Overall Height: 22 mm(Thickness)
    d. Net Weight: 4 - 5 Kg

11B. Drawing Board Stand 700mm x500 mm IS: 1444

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.6 Pg. No. 8 & Item No. 8 Pg. No. 13

1. Basic Indicative Diagram

2. Manufacturing, Supplying and Installation of Fully Adjustable & Modular Drawing Stand with Drawing Board (Drafting Table) with the following design, specifications,manufacturing process and tests.
3. Confirming to IS CODE: 513D, 3074, 14587-1998
4. Dimensions:

e. Width of the Stand: 960 to 980mm
f. Depth of the Stand: 680 to 700mm
g. Min Height of the Stand (Vertical Drawing Board): 880 to 900mm
h. Max height of the Stand (Vertical Drawing Board): 1480 to 1500mm
i. Min Height of the Stand (Horizontal Drawing Board): 780 to 800mm
j. Max height of the Stand (Horizontal Drawing Board): 1080 to 1120mm
k. Overall size of the Drawing Board: 762 X 1066mm
l. Angle Adjustment: 0° to90°

6. Design: Drawing Table consists of two parts: First part is the steel frame structure with accessories tray. Second part is the drawing board that is made up of minimum 12mm thick pre-laminated MDF board.
7. Construction:
    a. The steel frame structure should be made of25mm x 25mm x 0.9mm (20Gauge) 25mm x 50mm x 0.9mm (20gauge)20mm x 20mm x 0.9mm (20Gauge)25mm x 50mm x 1.2mm (18Gauge) Thick (CRCA) Mild Steel Tubes and 0.7mm thick CRCA (Mild Steel) Sheets.
    b. The structure should support the drawing board with the help of 6 self-tapping screwed joints. Other metal fittings to be manufactured using Ø5/8" (CRCA) Steel Tubes of thickness 0.9mm and minimum Ø12mm bright bar.
    c. Accessories tray for keeping the drafting instruments should be provided with the drawing table, below the drawing board as shown in the figure. The accessory tray should bea single-piece sheet-metal part with all the 4 edges folded (bent) upwards. Cold Rolled (CRCA) Mild Steel Tubes of 0.9mm and 1.2mm thickness conforming to IS3074 should be

used for the structure. Cold Rolled (CRCA) Mild Steel Sheets of 0.7mm thickness conforming to IS 513D should be used for the accessories *tray*.

d. Drawing Board: Minimum 12mm thick MDF compliant pre-laminated board of approved shade with 2mm thick PVC edge banding of matching color (as per approval) all over the work surface edges. Pre-laminated MDF Board shall conform toIS14587-1998.

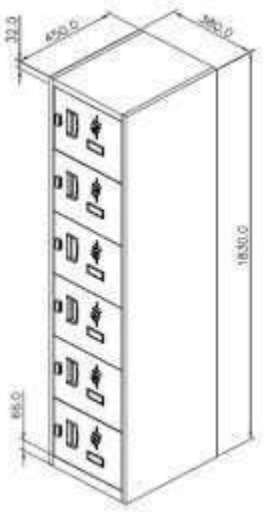
8. Functions: 4 leveling bolts to be used (2 ineach leg) for stability on uneven floor. Leveling bolts to be manufactured using 10mm ABS molded bolts.
9. All pipe/tube ends to be covered tightly and properly with ABS molded buffers/end caps. Other plastic parts to be molded using ABS, Nylon or Glass-filled Nylon only.
10. Stand should be such that the height of the drawing board as well as the angle can be fully adjusted with the help of 4 pivoted joints and 4 friction clutches. The design should permit a height adjustment of the drawing board from 79cm to 148cm (measured from the ground with zero adjustment of the leveling bolts) and an angle adjustmentof 0° (parallel to the ground) to 90° (perpendicular the ground).
11. The friction clutches should support positive (slip-free) locking and unlocking of the drawing board at any operating position and should not slip under normal working loads/conditions. Each friction clutch to be manufactured using a set of 13 strips of 1.2mm thick CRCA (Mild Steel) Sheets, zinc plated and insert molded into an ABS block so that a rigid, play-free joint is formed. Each friction clutch should be operated separately by a cam-operated handle as shown in the figure. These handles should fulfill the locking/unlocking action in a quarter (90°) turn of the cam. The handles to be molded using Glass-filled Fiber Nylon and should be supplied with a 10 years replacement warranty against manufacturing defects/breakages.
12. The tightening/ loosening bolts/ nuts with M.S. powder coated handle may be provided with additional locking mechanism such as cotter pin, lock nuts or other suitable arrangement (as per approval) to ensure that the connections stay secure at all times.
13. Finish: Epoxy Polyester Powder Coating to the thickness of minimum 50 - 60 microns (± 10 microns). The body including the framework, legs and tray involves an 8 step powdercoating process consisting of antirust surface treatment viz. hot water rinse, knock of degreasing, degreasing, cold water rinse, phosphating, cold water rinse, passivation,dry off oven treatment and finished with powder coating using epoxy polyester powder. The material lis then oven baked with a controlled temperature of 130 - 200° C.
14. Colour: The structure should be powder-coated in Nickel Grey color as per approval. The accessories tray should be powder-coated in Blue Moon color as per approval. All plastic components should be injection molded only with virgin material in Black/DarkGrey color as per approval. Color of Pre-laminated MDF board: Final color scheme of the pre-laminated board as well as edge banding will be approved by DVET at the time of placement of order. Manufacturer to furnish various color schemes available with them.
15. Manufacturing Process: In-house CNC Laser cutting machines should be used for cutting sheet-metal as wellas tubular parts. All plastic components to be made up of ABS/ Nylon/ Glass-filled Nylon and should be in-house molded on a fully automatic CNC controlled vertical injection molding machine. Plastic parts should not have visible sink marks, warpage, flash, discoloration, blow holes, ejector marks or any other defect.
16. Stands should be manufactured with proper in-house tooling, jigs, dies and fixtures to ensure uniformity and standardization in all parts.

17. Stands should have interchangeability of all components to ensure free availability and fixing/ replacement of any part of the structure over 5years.
18. All sheet- metal shearing, bending and folding operations to be carried out on in-house press brakes, hydraulic presses and shearing machines/ iron workers.
19. In-house MIG welding for clean and full strength welds and a play-free structure. Allwelded edges should be machine finished (through grinders or polishing instrument). All edges, corners and joint soft he steel frame and the accessories tray should be chip free and properly chamfered/rounded.
20. The structure and the accessories tray should be epoxy powder coated in an in-house powder coating facility with standard pre-treatment procedure. The manufacturing processes given are generalized. Need to consider wherever it isapplicable as per the Specifications of the product.
21. All raw materials for manufacturing process shall be as per relevant IS code.
22. Size and Weight:
    a. Overall Length: 1500mm
    b. Over all Depth: 1000mm
    c. Over All Height: 1000mm
    d. Net Weight: Minimum 18-21Kg

12. STEEL LOCKERS FOR 20 TRAINEES (PIGEON CUP BOARD)

As Per DVET, Maharashtra State, SPECIFICATION FOR FURNITURE GROUP ITEMS Version 3 -2018 – 19, Sr. No -12 Page no 33 (TDM Jigs & Fixtures Item No 59 Pg No. 86)

1. Basic Indicative Diagram



2. Confirming to IS CODE –513(2008), 13871(1993)

3. The overall size of the storage shall be1520mm (W) x450mm (D) x1830mm (H).

4. There shall be 4 units of 6 Door Lockers of equal dimensions.

5. Combination:

12.6.1 6 Door Base Unit(Size-380mmW)-one number

12.6.2 6 Door Add On unit (Size-380mmW)-Three number

ii. Construction:

iii. The construction shall be Knock down Construction.

iv. Overall Construction shall be 0.6 mm thick CRCA confirming to IS:51 3-2008 grade.

v. Shelf should have uniform load carrying capacity up to 35Kg.

vi. Handle-Aesthetically appealing Snap fit ABS plastic handle.

vii. Label Holder-Plastic label holder should be provided for identification.

viii. The locking mechanism shall be provided for individual compartment. Locks should be10 Lever cam lock with lock lever. Min. 03 keys for each compartment shall be provided.

ix. Finish: Epoxy Polyester Powder in fire retardant paint coated to thethickness of minimum 50–60 microns (+/-10).

x. Process:

12.7 The body including shelves, compartment, and framework for door involves an 8step powder coating process consisting of antirust surface

12.8 Treatment viz. Hot water rinse, Knock of degreasing, degreasing, cold water rinse, phosphating, cold water rinse, passivation, dry off oven treatment and

12.9 Finished with powder coating using epoxy polyester powder of minimum 50 –60 microns (+/-

12.10 The material is then oven baked with a controlled temperature of 180 deg. C to200 deg. C.

xi. Tests:

The powder coating treatment shall strictly comply with IS: 13871 (1993) inclusive of method of tests i.e. Dry film/ coating thickness, Finish, Gloss 60°, Colour retention, Scratch hardness, Impact resistancetest, Conical Mandrel test, Ericson cupping test, Pencil hardness, DFT measurement, Salt spray test, Adhesion Crosscut test, Rub test with MEK, Protection against humidity, Resistance to boiling water, lubricating oil, petrol, heat double bake, boiling detergents, acid/ alkali. The test reports shall be submitted along with the tender.

xii. Colour: The colour shall be Prince Grey/Snow bell Grey. Final colour scheme will be approved by DVET at the time of placement of order. Manufacturer to furnish various colour schemes available with them

xiii. Manufacturing Process: The complete unit shall Be as per manufacturer's specifications and Flow chart of manufacturing process shall be submitted along with the tender.

xiv. Raw materials (Wood working): 1) Plain Particle Board (PPB), Medium Density Fiber Board (MDF), Pre-laminate Board (PLB), 4) Decorative Laminate (DL), 5) Fabric and 6) Lipping (PVC lipping).

xv. Process (Woodworking): MDF board from approved supplier- >Wood Cutting (cutting from mother board 600mm x 2400mm sheet to the desired size on Panel saw machine with no sharp edges, no glue marks, no scratches, no machine marks and no cracks at drill hole) -> Lamination (Hot lamination adhering Decorative laminated MDF board using approved make adhesive)-> Sizing/ Routing (fine sizing and setting curvilinear shapes) -> Lipping/Edge banding (adhering PVC lipping on MDF board using hot melt glue under heat and pressure) ->Finishing->Assembly and Packaging (carcase / panel assembly, final inspection/correction if required, packing and dispatch).

xvi. Raw materials (Metalworking): 1) Stainless Steel (Nickel and Chromium added to prevent steel from rusting), 2) Mild steel and 3) Epoxy polyester powder (for powder coating). Process (Metal working): CRCA sheet from approved supplier -> Notching(cutting at the edge and punching holes, shearing, turret punching/ press operation, de burring of punched sheet) -> Metal forming (blending for the purpose of different applications, sheet bending)->Assembly/Sub- Assembly (for welded all components get assembled and for knock down sub -assembly takes place. CO2 welding and spot welding is done) ->

Pre- treatment (8 step process including anti-rust surface treatment) -> Powder coating (surface coating applied in the form of powder and on curing produces a protective coating, examination of test coating specimen for blisters, flaking and corrosion)->Assembly and Packaging (carcase /panel assembly, final inspection/ correction if required, packing and dispatch).

xvii. Raw materials (Metalworking):1) Aluminium Extrusion.

xviii. Process (Metal working): Aluminium Extrusion from approved supplier ->Cutting of Aluminium extrusions to desired size -> Assembly and Packaging (carcase / panel assembly, final inspection /correction if required, packing and dispatch).

xix. All raw materials for manufacturing process shall be as per relevant IS code.

xx. Size and Weight:

a.	Overall Length:	1520mm
b.	Overall Depth:	450mm
c.	Overall Height:	1830mm
d.	Net Weight:	Minimum60-80Kg

13. Draughtsman stool

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.9 Pg. No. 70

1. Basic Indicative diagram

2. Durable PU seat and back is impervious to water, oil and most chemicals
3. Back has height and rake adjustment and works with a "permanent contact back" mechanism
4. Full height 125 rated gas strut fitted as standard
5. Adjustable foot ring helps with posture and comfort. Base fitted with glides
6. Designed for "severe contract" use
7. Seat Height 68 - 82 cm
8. Overall Width 46 cm
9. Overall Depth 45 cm
10. Overall Height 103 - 128 cm
11. Product is delivered flat packed/fully assembled condition
12. Warranty: One year against manufacturing defects
13. Industrial / Laboratory PU high chair made in the UK and designed for areas such as vets surgery, industrial stores departments, ticket offices, manufacturing facility and health applications.
14. An optional seat tilt is available for a small premium. A low chair version is also available.
15. Minimum quantity must be 10 numbers and product will be delivered 3 - 5 days
16. Free Delivery within Chennai, rest of India shipping charged as applicable.
17. All prices shown are inclusive of GST and carriage.
18. Delivery Period: 48 Hours within Chennai.

14. Desktop computer

i. Basic Indicative diagram

2.

i. CPU: **64 Bit** i7 or latest processor,
ii. Speed: 3. GHz or Higher.
iii. RAM:-16**GB**
iv. DDR-4 or higher,
v. Wi-Fi Enabled.
vi. Network Card: Integrated Gigabit Ethernet,with USB Mouse, USB keyboard and Monitor (Min. 22 Inch)
vii. Licensed Operating System
viii. Window 11 and Antivirus, compatible with trade related software.

15. Laptop latest configuration RAM – 16 GB, HD/SSD (512)

1. Basic Indicative diagram

a. 

2. High configuration laptop with best clock speed with maximum possible RAM ie. 16gb,10 Core processors i7.
3. Free upgrade to Windows 11 when available. Disclaimer-Upgrade rollout plan is being finalized and is scheduled to begin late in 2021 and continue into 2022. Specific timing will vary by device
4. Processor:12th Generation Intel Core i7-1255U (16MB Cache, up to 5.0 GHz, 8 cores), Memory &Storage: 16GB, 2x8GB, DDR4 2933MHz | 512GB M.2 PCIe NV Me Solid State Drive
5. Display: 15.6 inch FHD (1920 x 1080) 120Hz 250 nits WVA Anti- Glare LED Backlit Narrow BorderDisplay
6. Graphics: NVIDIA GEFORCE RTX 3050 Ti (4GB GDDR6) | Game Shift Technology
7. Operating System & Software: Windows 11
8. Microsoft Office Home andStudent 2021
9. Keyboard & Battery: Orange Backlit keyboard | 3-Cell Battery
10. I/O Ports:(1) HDMI 2.0, (2) Super Speed USB 2.0 Gen 1 Type-A including (1) with Power Share, (1) Super Speed USB 3.2, Headphone/Mic, (1) RJ45
11. Others : Nahimic 3D audio | Intel Wi-Fi 6 2x2 (Gig+) | Bluetooth 5.1

16. Server Computer

15.6.1.1.1.1 Basic Indicative Diagram

i7 Computer

Intel Core i7-3770s Processor, Quad-Core, 3.10GHz
16GB DDR3 RAM with NVIDIA GeForce GTX1650 GDDR4 graphics card | Storage: 120 GB SSD & 1TB HDD
Operating System: Pre-loaded Windows 10 or higher with license | In the box: Desktop, Power Cable
Total:- 6 USB PORT 4*USB 2.0 Ports (Rear) 1*USB 2.0 ports (front)1*USB 3.0 ports (front), , 1 PCI Express Port to install Graphic Card, Front Audio, HDMI Port
2 YEAR WARRANTY ON COMPLETE SYSTEM

15.6.1.1.1.2Latest Processor

Latest Processor, 3GHz or Higher, HD Drive: 500GB or Higher, 7200rpm (minimum)or Higher
Cache Memory 8 GB, DDR3 or Higher
Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet (10/100/1000)
Ports & CD drive: 1 VGA | Rear: 6 x USB 2.0 Ports Front: 2 x USB 2.0 Ports |Without DVD-drive | LAN Port, Antivirus (Free Version)
2 or 3 YEAR WARRANTY ON COMPLETE SYSTEM

17. Software: MS- office latest version, 3D CAD with latest Licensed version

a. Software: MS- office latest version,
b. 3D CAD with latest Licensed version with SWIFT technology, support minimum 24 data translators, Should be directional associative, should facilitate the Additive Manufacturing technician with latest trends in Engineering costing which should be built in the 3D software,3D software should have facility for scan to 3D operation, 3D software should support single window integration for design & topology optimization, should have facility to prepare “First Article Inspection Reports” for QC process.
c. Re-engineering techniques software should be provided

18. Laser Printer A3 size

2. Basic Indicative diagram

3. Compatible operating system: - Windows 7 (32/64 bit), Windows 2008 Server R2, Windows 8 (32/64 bit), Windows 8.1 (32/64 bit), Windows 10 (32/64 bit), Windows 2012 Server Windows 2016 Server, Red Hat Enterprise Linux 5. 6. Fedora 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, SUSE Linux Enterprise Desktop: 10, 11, 12, Debian 6, 7, 8, 9, Linux Mint 15, 16, 17, 18
4. Connectivity: - high speed USB 2.0 device, Ethernet 10/100 base TX.
5. Dimensions: - Minimum: 560 x 540 x 417 mm Maximum: 960 mm x 1090 mm x 933 mm
6. Display: - 4-line LCD
7. Duty Cycle:- Up to 50000 Pages
8. Format (Scan): - PDF, JPEG, TIFF
9. Frequency: -50-60 Hz
10. Function Type: - All-in-one Printer
11. Functions: -Print. Copy, Scan
12. Humidity Range: - 20 to 80% RH
13. Input Voltage: - 220 – 240 AC
14. Media Format: - First Page Out (Ready) Black As Fast as 8.3 sec
15. Memory: - 512 MB
16. Model:- MFP
17. Operating Temperature Range: - 10 to 30 deg C
18. Output : - Monochrome
19. Pressure : - Acoustic Emissions 51 dB(A)
20. Print Language: - PS
21. Print Speed : - Normal: Up to 22 ppm
22. Processor Speed: - 600 MHZ
23. Recommended Monthly Print Volume: - 2000 to 5000
24. Scan Resolution: - Up to 600 dpi
25. Scan Size: - 297x432 mm
26. Scan Speed: - Up to 33 ipm (B&W) Up to 33 ipm (Color)
27. Scanner Type: - Flatbed

28. Size : - Supported: A3, A4, A5, A6, B4, B5, Tray 1: 60 to 163 g/m² & Tray 2: 60 to 110 g/m²
29. Supply Type: - Normal Operation 550 W Ready: 80 W Max/Peak: 1.1 kWh Sleep/Power Off. 1/02 W TEC: 0.310 kWh/Week
30. Technology: - Laser
31. Type : - Toner Cartridge
32. Weight : - Up to 30 kg

19. UPS 5 kva for printing machine & computer

As Per DVET, Maharashtra State, SPECIFICATION FOR ICTSM Item No.38 Pg. No. 63

1. Basic Indicative diagram

16. **Type of UPS** **: -** TRUE ONLINE
17. **CAPACITY** **: -** 5 kVA
18. **Technology** **: -** IGBT, and microprocessor controlled for providing better sine wave output
19. **AC input voltage range** : - 175V to 275 VAC, Single phase.
20. **Input Frequency** : - 47-53Hz,(Suitable for working with Generator supply)
21. **UPS power factor at rated load** **: -** 0.9 or better
22. **AC output voltage** **: -** 230V AC±2% ,Single Phase
23. **Output frequency** **: -** 50Hz±1%
24. **Waveform** **: -** Sinusoidal
25. **Efficiency** **: -** 90% (at rated output voltage and frequency)
26. **Total harmonics distortion** : - 2%maximum
27. **Indications Standard** **: -** visual indications for proper function of UPS (i)
28. **Protections** **: -** Over &Under Voltage cut-off,Overload,and short
29. **Backup time** **: -** 5kVA=8Hr. at 1000W load
30. **Type of batteries** **: -** Sealed Maintenance Free(SMF)Lead Acid battery(VRLA)

20. White Board for using LCD projector (optional)

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.16 Pg. No. 25

1. Basic Indicative Diagram:

2. Manufacturing, Supplying and Installation of wall mounted Ceramic coated steel sheet top surface White Board with the following design, specifications, manufacturing process and tests.
3. Size of White Board: 4 X 6feet. Confirming to IS CODE – 3087,733
4. White Board with Ceramic Coated Steel Sheet Top Surface: Steel writing board for writing purpose mounted on wooden based particles board (as per IS: 3087) with electro galvanized backing steel sheet and frame anodized extruded Aluminium alloy hollow section.
5. Writing Surface: The writing top surface shall be made of steel sheet of thickness 0.27 to 0.30 mm. Itshall have vitreous enamel coating of 0.095mm min. thickness on top and 0.03 mm min. on the back. The top shall be free from waviness and shall show excellent erasability. Gloss of sheet shall be 60 deg @ Lead 60.
6. Core Materials: The core material shall be 9 mm thick wood Base plain particleboard. (Supported with Test Certificates of the Manufacturers.)
7. Backing Materials: The backing material sheet shall be minimum 0.25 mm thick electro galvanized steel sheet. Both the top and the backing sheet shall be properly fixed with particle board using rubber based adhesive to avoid any moisture absorption. (Supported with TestCertificates of the Manufacturers.)
8. Aluminium Frame: The Board shall have all round framing of anodized extruded aluminium alloys hollow section. Designation 63400 as per IS: 733-1983 with Amendment No. 1 (Reaffirmed2006) Edition 4.1. (Supported with Test Certificates of the manufacturer)
9. The Frame section shall be
    a. Front: 25mm,
    b. Side: 18mm
    c. Wall thickness: 0.8 mm (+ 0.03mm)
10. Fitting Accessories: The writing board shall be provided with suitable heavy duty wall mounting Brackets. The board should be provided with necessary fitting clamps. The clamps should be Mild steel with suitable corrosion free coating like chrome plating/ Powder coatingmaterial to sustain board weight. A set of 4 nos. of Screw and 4 no's for Rowel Plugsshould be provided with each board 5. For fitting on the wall. Board Corners: The corner of the board should be made up with 100 % virgin ABS material. Packing: The boards shall be packed in corrugated paper packing/ box packing for local delivery and in wooden crate for dispatch by rail/road transport to with stand transit hazards. Free

Accessories: 1No.Chalk Tray and 1No. Magnetic Duster and 1No. Marker should be provided free with each board.
Marking: Each board shall be provided with indelible marking for:Name/Trade mark of the manufacturer Type of board Supply Order No. and date.
Weight: The weight of the Green board shall be 25-30Kg

21. Instructor Table Regal steel

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.17 Pg. No. 28

1. Basic Indicative Diagram

2. Manufacturing, Supplying and Installation of Pre-laminated Instructor Table as per the following design, specification, manufacturing process and tests.
3. Dimensions: Overall size of 1200mm (W) X 600mm (D) X 735mm (H).

4 Construction: Top Work surface:

4.1 18mm thick pre-laminated board as per IS: 12823 of approved shade with 2mm thick PVC edge banding all over the work surface edges.

5. Understructure: Rectangular Frame Fabricated component in 1.2mm thick CRCA (IS: 513).
6. Leg: Fabricated component in 38mm x 25mm x 1.2mm thick CRCA ERW Tube (IS: 7138).
7. Plastic Cap for Cable travel- Injection Molded Polypropylene. Leveler glide for Leg- Nylon 6 and MS Bolt.
8. Storage Pedestal: Out of 3 drawers (Box + Box + File), the bottom most will be the file drawer and top drawer shall have a pencil tray. The storage unit shall also have suitable sliding arrangement, handle locking facility, etc.
9. Shell- 0.6mm thick CRCA (IS: 513). Drawer Tray- 0.6mm thick CRCA (IS: 513).
10. Drawer Front- 0.8mm thick CRCA (IS: 513). Frame Assembly- 1.2mm thick CRCA (IS: 513).
11. Lock- 10 Lever Cam Lock central locking mechanism. Handle- Injection Molded Polypropylene.
12. Leveler- Nylon 6 and MS Bolt.
13. Wire Management:
14. Entry of wires into the Table shall be possible from the floor horizontal Wire Carrier- 0.7mm thick CRCA (IS: 513) Vertical Wire Carrier- 0.8mm thick CRCA (IS: 513)
15. (Only provision of carrier for electrical /data slots below the work top shall be Provided)
31. Finish: Epoxy Polyester Powder to the thickness of minimum 50–60 microns (+/-10).

Process:

32. The body including understructure, framework, legs, storage pedestal including fittings involves an 8 step powder coating process consisting of antirust surface treatment viz. Hot water rinse, Knock of degreasing, degreasing, cold water rinse, phosphating, cold water rinse, passivation, dry off oven treatment and finished with powder coating using epoxy polyester powder of 50 – 60 microns (+/-10). The material is then oven baked with a controlled temperature of 180 deg. C to 200 deg. C.

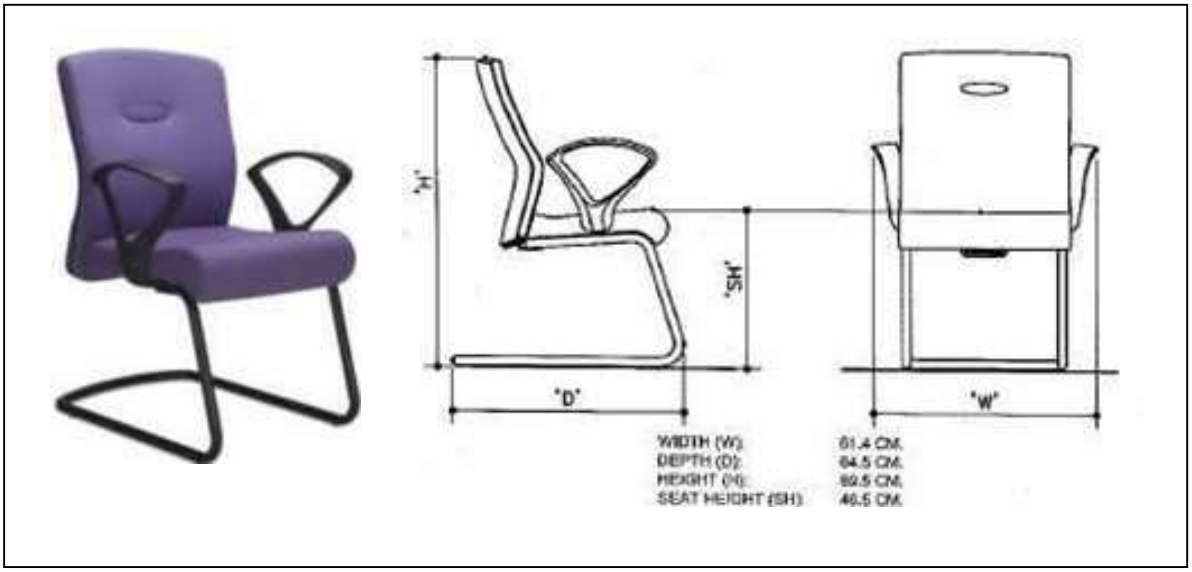
Tests:

33. The powder coating treatment shall strictly comply with IS:13871 (1993) inclusive of method of tests i.e. Dry film/ coating thickness, Finish, Gloss 60°,Colour retention, Scratch hardness, Impact resistance 17. test, Conical Mandrel test, Erichsen cupping test, Pencil hardness, DFT measurement, Salt spray test,AdhesionCrosscuttest,RubtestwithMEK,Protectionagainsthumidity, Resistancetoboilingwater,lubricatingoil,petrol,heatdoublebake,bleeding, detergents, acid/ alkali. The test reports shall be submitted along with the tender.
34. Color: The color of the PLB shall be Silver Grey / Teak and Core Ash/ Grey for Frame work. Final color scheme will be approved by DVET at the time of placement of order. Manufacturer to furnish various color schemes available with them.
35. Manufacturing Process: The complete unit shall be as per manufacturer's specifications and shall be Submitted along with the tender.
36. Raw materials (Wood working): 1) Plain Particle Board (PPB), 2) Medium Density fiber Board (MDF), 3) Pre-laminate Board (PLB), 4) Decorative Laminate (DL), 5) Fabric and 6) Lipping (PVC lipping).
20. Process (Wood working): MDF board from approved supplier-> Wood Cutting (cutting from mother board 600mm x 2400mm sheet to the desired size on Panel saw machine with no sharp edges, no glue marks, no scratches, no machine marks and no cracks at drill hole) -> Lamination (Hot lamination adhering Decorative laminateto MDF board using approved make adhesive)
21. -> Sizing/ Routing (fine sizing and setting curvilinear shapes) -> Lipping/ Edge banding (adhering PVC lipping on MDF board using hot melt glue under heat andpressure) -> Finishing -> Assembly and Packaging (carcase/ panel assembly, finalinspection/ correction if required, packing and dispatch).
22. Raw materials (Metal working): 1) Stainless Steel (Nickel and Chromium added to prevent steel from rusting), 2) Mild steel and 3) Epoxy polyester powder (for powder coating).

22. Instructor Chair

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.18 Pg. No. 30

1. Basic Indicative Diagram:



2. Manufacturing, Supplying and Installation of Mid-back Tubular framed Chair for Instructor in the Classroom as per the following design, specification, manufacturing process and tests.
3. Dimensions: Overall size of 610mm (W) X 640mm (D) X 850mm (H).Seat Size: 470mm (W) x 480mm (D) X 450mm (H). Mid Back size: 475mm (W) x 580mm (H).
4. construction:
5. Seat and Back Assembly: Seat and back are made up of 12mm thick hot- pressed plywood, upholstered with fabric upholstery covers (Fabric color shall be approved by DVET) and molded Polyurethane foam. The back foam is designed with contoured lumbar support for extra comfort. The seat has extra thick foam on front edge to give comfort to political area. The polyurethane foam shall be as per manufacturer's specification. Seat durability test (cyclic test) to perform 1, 00,000 cycles for a load of 57 Kgs made to free fall on the seat from a height of25mm.
6. High Resilience Polyurethane Foam: The HR Polyurethane foam shall be molded with density = 45 +/-2 Kg/m3 and Hardness = 20 +/- 2 Kgs on Hampden machine complying to IS: 7888 at 25%compression and it should be covered with fabric as per manufacturer's shade card. The polyurethane foam shall be as per manufacturer's specification.
7. Armrest: The one-piece armrests shall be injection molded from black co-polymer Polypropylene. Tested to perform 60,000 cycles for a load of 40 Kgs applied at 10Deg.
8. Understructure Assembly: The understructure assembly is a cantilever type powder coated (DFT 50-60microns) tubular mainframe made of dia 25 +/- 3mm X 2 +/- 1.6mm thick M.S.ERW Tube (IS: 7138).
9. Finish: Epoxy Polyester Powder coated to the thickness of 50 – 60 microns (+/-10).
10. Process: The body including tubular framework, support, etc. for Chair involves an 8 step powder coating process consisting of antirust surface treatment viz. Hotwater rinse, Knock of degreasing, degreasing, cold water rinse, phosphating, cold water rinse, passivation, dry off oven treatment and finished with powdercoatingusingepoxypolyesterpowderof50–60 microns (+/-10).The material is then oven baked with a controlled temperature of 180 deg.C to 200 deg.C.
11. Tests: The powder coating treatment shall strictly comply with IS:13871 (1993) inclusive of method of tests i.e. Dry film/ coating thickness, Finish, Gloss 60°,Colour retention, Scratch hardness, Impact

resistance test, Conical Mandrel test, Erichsen cupping test, Pencil hardness, DFT measurement, Salt spray test, Adhesion Crosscut test, Rub test with MEK, Protection against humidity, Resistancetoboilingwater,lubricatingoil,petrol,heatdoublebake,bleeding, detergents, acid/ alkali. The test reports shall be submitted along with the tender.

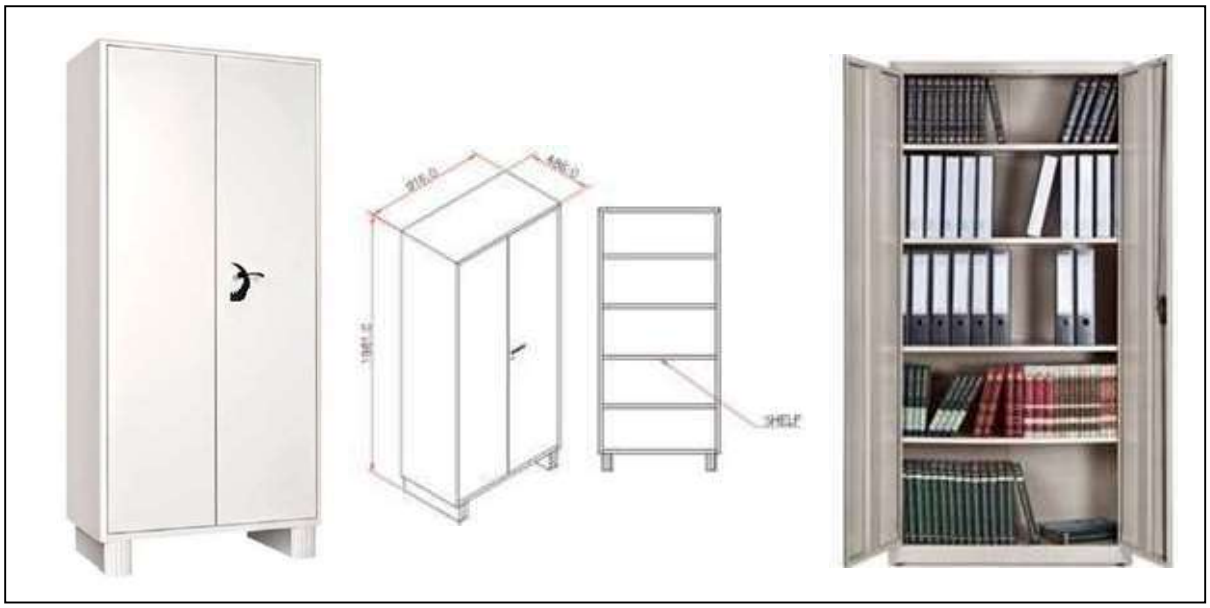
12. Colour: The colour of the Fabric shall be Carbon Black, Milan Red, and Copper Moon Final colour scheme will be approved by DVET at the time of placement of order. Manufacturer to furnish various colour schemes available with them.
13. Manufacturing Process: The complete unit shall be as per manufacturer's specifications and Flow Chart of manufacturing process shall be submitted along with the tender.
14. Raw materials (Wood working): 1) Medium Density Fiber Board (MDF), 2)Plywood 3) Fabric.
15. Process (Wood working): Plywood from approved supplier Wood Cutting (cutting from 12mm thk. mother plywood 1200mm x 2400mm sheet to the desired size onPanel saw machine with no sharp edges, no glue marks, no scratches, no machine marks and no cracks at drill hole) Sizing/ Routing (fine sizing and setting curvilinear shapes) Fabric from approved supplier Inspection of fabric Fabric cutting to desired shape Ironing to cut piece of fabric Fabric stapling on the tile Fabric pasting to metal tile Fabric tile inspection Fabric tile plastic wrapping Assembly and Packaging (panel assembly, final inspection/ correction if required, packing and dispatch).
16. Raw materials (Metal working):

i. Stainless Steel (Nickel and Chromium added to prevent steel from rusting),
ii. Mild steel and
iii. Epoxy polyester powder (for powder coating)

23. Amirah Steel

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.19 Pg. No. 32

1. Basic Indicative Diagram:



2. Manufacturing, Supplying and Installation of Steel Cupboard having four shelves making five compartment swath two door shutter as per the following design, specification, manufacturing process and tests.
3. Confirming to IS CODE–513(2008),13871(1993)
4. Dimensions: Overall size of 900mm (W) X450mm (D) X1800mm (H)
5. Construction: The construction shall be welded construction with 0.7mm thick CRCA for shelf and 0.8mm thick for sides and back confirming to IS: 513 -2008 grade. The width of the side sheet shall correspond to the depth of the top. The sides shall extend between the extreme surface of the top and bottom shelves. The width of the back sheet shall correspond to width of the top. The back shall extend between the extreme surface of the top and bottom shelves. The length of the top and bottom shall cover the width of the cabinet and the breadth shall cover the depth of the cabinet made of 0.8mm thick CRCA. The inside folded edges shall have stiffening. The welded edges should be machine finished. All material should be used of relevant ISI specification.
6. Configuration (Doors): Two door shutters shall be made of 0.8mm thick CRCA and all other metal component shall be made of 0.9mm thick CRCA. CRCAD grade conforming to I S: 513-2008.Shutter shall have metal stiffeners suitably welded or riveted to stiffen the door. The center to Centre distance between two adjacent hinges to theright side of the cabinet shall have a hole for the handle and key slot for the key of the lock. The clearance around the door between the door flanges and side top and bottom flangesshallnotbemorethan1.25mm.
7. Hinges: The hinges shall be either plain butt type made from CRCA not less than 1.6mm thick or double folded type fabricated from CRCA sheet not less than 1.25mm thick. The hinges shall be secured to the mild steel hinge bracket not less than 2.5mm thickon one side and shall be secured to the door on the other side of the fulcrum. The number of hinges per door leaf shall not be less three.
8. Lock: The locking and handle of the storages hall be oxidized brass Mazak handle with three-way locking mechanism controlled by lock operated by handle with min 03 duplicate keys of Godrej/ Vijayan or of approved make.

9. 10 Shelves: The shelf panel (minimum four nos.) shall be height adjustable and should be made of 0.7mm thick CRCA steel confirming to IS: 513 -2008 grade to take the maximum load bearing capacity of 75 Kg uniformly distributed per shelf. Shelves shall have lipped flanges 25mm in width and 15mm in depth. Each shelf shall be supported on four shelf bracket. The bracket shall be made of CRCA not less than 1.6mm thick. The bracket shall be so designed and constructed that the shelf is securely supported and that adjustment inside the bracket can be effected easily. Four rack strips with machine punched slots shall be provided for supporting the shelves covering the full height of the cabinet. Rack strips shall be made of CRCA not less than 1.00mm thick.
10. Pedestal: Two pedestals spanning the depth of the cabinet shall be made from CRCA sheet not less than 1.00mm thick and shall be properly stiffened. The pedestal shall not project out of the cabinet and shall be 125±5mm in height.
11. Finish: Epoxy Polyester Powder in fire retardant paint coated to the thickness of minimum 40–60 microns (+/-10).
12. Process: The body including shelves, framework for door including hinges involves and step powder coating process consisting of antirust surface treatment viz. Hot water rinse, Knock of degreasing, degreasing, cold water rinse, phosphating, cold water rinse, passivation, dry of overtreatment and finished with powder coating using epoxy polyester powder of minimum 40–60 microns (+/-) 10). The material is then oven baked with a controlled temperature of 180 deg.C to 200 deg.C.
13. Tests: The powder coating treatment shall strictly comply with IS: 13871 (1993) inclusive of method of tests i.e. Dry film/ coating thickness, Finish, Gloss 60°, Colour retention, Scratch hardness, Impact resistance test, Conical Mandrel test, Erichsen cupping test, Pencil hardness, DFT measurement, Salt spray test, Adhesion Cross cutest, Rub test with MEK, Protection against humidity, Resistance to boiling water, lubricating oil, petrol, heat double bake, bleeding, detergents, acid/ alkali. The test reports shall be submitted along with the tender.
14. Colour: The colours hall be Prince Grey /Snowbell Grey. Final colour scheme will be approved by DVET at the time of placement of order. Manufacturer to furnish various colours schemes available with them
15. Manufacturing Process: The complete unit shall be as per manufacturer's specifications and Flow chart manufacturing process shall be submitted along with the tender.
16. Raw materials (Wood working): 1) Plain Particle Board (PPB), 2) Medium Density Fiber Board(MDF), 3)Pre-laminate Board(PLB),4)Decorative Laminate (DL), 5) Fabric and 6)Lipping(PVC lipping).
17. Process (Woodworking) :MDF board from map proved supplier Woodcutting(cutting from mother board 600mm x 2400mm sheet to the desired size on Panel saw machine with no sharp edges, no glue marks, no scratches, no machine marks and no cracks at drill hole) Lamination (Hot lamination adhering Decorative laminate to MDF board using approved make adhesive) Sizing/ Routing (fine sizing and setting curvilinear shapes) Lipping/ Edge banding (adhering PVC lipping on MDF board using hot melt glue under heat and pressure) Finishing Assembly and Packaging (car case /panel assembly, final inspection/correction if required, packing and dispatch).
18. Raw materials (Metalworking):1) Stainless-steel (Nickel and Chromium added to prevent steel from rusting), 2) Mild steel and 3) Epoxy polyester powder (for powder coating).
19. Process (Metal working): CRCA sheet from approved supplier Notching(cutting at the edge and punching holes, shearing, turret punching/ press operation, debarring of punched sheet) Metal forming (blending for the purpose of different applications, sheet bending) Assembly/Sub- Assembly(for welded all components get assembled and for knock down sub- assembly takes place. CO_2 welding and spot welding is done) Pre-treatment (8 step process including anti-rust surface treatment) Powder coating (surface coating applied in the form of powder and on curing produces a protective coating, examination off test

coatings specimen for blisters, flaking and corrosion) Assembly and Packaging (carcase /panel assembly, final inspection/ correction if required, packing and dispatch).

20. Raw materials (Metalworking): 1) Aluminum Extrusion.
21. Process (Metal working): Aluminum Extrusion from approved supplier ->Cutting of Aluminum extrusions to desired size -> Assembly and Packaging (carcase/panel assembly, final inspection/correction if required, packing and dispatch). For Steel Cupboard only Welded construction is acceptable. The manufacturing processes given are generalized .Need to consider wherever it is applicable as per the Specifications of the product.
22. All raw materials for manufacturing process shall be as per relevant IS code
23. Size and Width:
    i. Overall Length: 900mm
    ii. Overall Width: 450mm
    iii. Overall Height: 1800mm
    iv. Net Weight: Minimum70 to 80kg

24. Computer Table

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.20 Pg. No. 35

1. Basic Indicative Diagram:

6.2 Confirming to IS CODE

2. The overall size of the Computer Table shall be 900mm (W) x 600mm (D) X 750mm (H) It is designed such that it looks minimal yet takes care of every little detail. The under structure of this system comprises of leg assemblies and cross on connectors. Over this matrix of legs and cross connectors, the work surfaces are fixed

3. Components Main Leg Assembly: The main legs used in the entire system are fabricated by CO2 welded MS tube of section 50.8mm x 50.8mm x 1.2mm thick (as per IS: 7138 ERW). This shall be powdercoated with average 50 to 60 micron thickness of epoxy powder coating, as per approved shade. This shall be connected to the cross members & to the work surface with screws. (2 nos. each)

4. Cross Connector: These are the supporting members which span across the leg assemblies and form the understructure of workstation. These shall be fabricated by CO2 welded MS tube of section 50.8mm x 50.8mm x 1.2mm thick (as per IS: 7138 ERW) with two 100 x 55 x 5mm L-shaped connector brackets (IS: 2062 5mm HR)one it he rends, which will have counter sunk holes and oblong slots (1nos each)

5. Spacers: These spacers are used to give the floating effect of worktop. This shall maintain agap of

20mm between the understructure and the worktop, connected from bottom. These shall be plastic molded with nylon-

6. Work surfaces: Worktop 25 mm thick Pre-laminated with PVC edge band. Work top shall be made of 25mm thick pre-laminated particle board interior grade (As per IS: 12823). Bottom shall have a backing laminate of minimum 0.6 mm thickness. All the edges of work surface shall be provided with machine pressed 2 mm thick PVC Edge band glued with hot melt EVA glue.

7. Underside of the work surface shall be screwed to cross connectors and leg assembly. These worktops shall be provided with the slot for grommet, as per requirement.

8. CPU Trolley: Size- 230-345 W X 226DX180H

9. Metal Tray: Tray is made of 1.0 mm thick MS CRCA Sheet and Side support ismade of 0.8 mm thick MS CRCASheet

10. Castor: Lockable/Non-lockable twin wheel castors are injection molded inBlack Nylon. Metal Key board Pullout Tray (KBPT) The body including understructure, framework, legs, storage pedestal including fittings involves an 8 step powder coating process consisting of antirust surface treatment viz. Hot water rinse, Knock of degreasing, degreasing, cold water rinse, phosphating, cold water rinse, passivation, dry off oven treatment and finished withpowder coating using epoxy polyester powder of 50 – 60 microns (+/-10). The material is then oven baked with a controlled temperature of 180 deg.C to 200 deg.C.

11. Tests: The powder coating treatment shall strictly comply with IS: 13871 (1993) inclusive of method of tests i.e. Dry film/ coating thickness, Finish, Gloss 60°, Colour retention, Scratch hardness, Impact resistance test, Conical Mandrel test, Erichsen cupping test, Pencil hardness, DFT measurement, Salt spray test, Adhesion Cross cutest, Rub test with MEK, Protection against humidity, Resistance to boiling water, lubricating oil, petrol, heat double bake, bleeding, detergents, acid/ alkali. The test reports shall be submitted along with the tender. The finishing processes given are generalized. Need to consider wherever it isapplicable as per the Specs. Of the product.

12. Manufacturing Process: The complete unit shall be as per manufacturer's specifications and Flow chart of manufacturing process shall be submitted along with the tender.

13. Colour: Table Work top Color- highline Pine/White Cedar/Frosty White. Metal Understructure-Prince Grey/ Bond White. Final colour combination will be decided by DVET.

14. Raw materials (Wood working): 1) Plain Particle Board (PPB), 2) Medium Density Fiber Board (MDF), 3) Pre-laminate Board (PLB), 4) Decorative Laminate (DL), 5) Fabric and 6) Lipping (Clipping).

15. Process (Woodworking): MDF board from approved supplier Wood Cutting (cutting from mother board 600mm x 2400mm sheet to the desired size on Panel saw machine with no sharp edges, no glue marks, no scratches, no machine marks and no cracks at drill hole) Lamination (Hot lamination adhering Decorative laminateto MDF board using approved make adhesive) Sizing/ Routing (fine sizing and setting curvilinear shapes) Lipping/ Edge banding (adhering PVC lipping on MDF board using hot melt glue under heat andpressure) Finishing Assembly and Packaging (carcase/ panel assembly, final inspection/ correction if required, packing and dispatch).

16. Raw materials (Metal working): 1) Stainless Steel (Nickel and Chromium added to prevent steel from

rusting), 2) Mild steel and 3) Epoxy polyester powder (for powder coating).

17. Process (Metal working): CRCA sheet from approved supplier Notching (cutting at the edge and punching holes, shearing, turret punching/ press operation, debarring of punched sheet) Metal forming (blending for the purpose of different applications, sheet bending) Assembly/Sub-Assembly (for welded all components get assembled and for knock down sub-assembly takes place. CO2 welding and spot welding is done) -> Pre-treatment (8 step process including anti-rust surface treatment) -> Powder coating (surface coating applied in the form of powder and on curing produces a protective coating, examination of test coating specimen for blisters, flaking and corrosion) -> Assembly and Packaging (carcase/ panel assembly, final inspection/ correction if required, packing and dispatch).

18. Raw materials (Metal working): 1) Aluminum Extrusion.

19. Process (Metal working): Aluminum Extrusion from approved supplier Cutting of Aluminum extrusions to desired size -> Assembly and Packaging (carcase/panel assembly, final inspection/correction if required, packing and dispatch).

20. The manufacturing processes given are generalized. Need to consider wherever it is applicable as per the Specifications of the product.

21. All raw materials for manufacturing process shall be as per relevant IS code.

22. Size and Weight:

    a. Overall Length :900mm

    b. Overall Depth :600mm

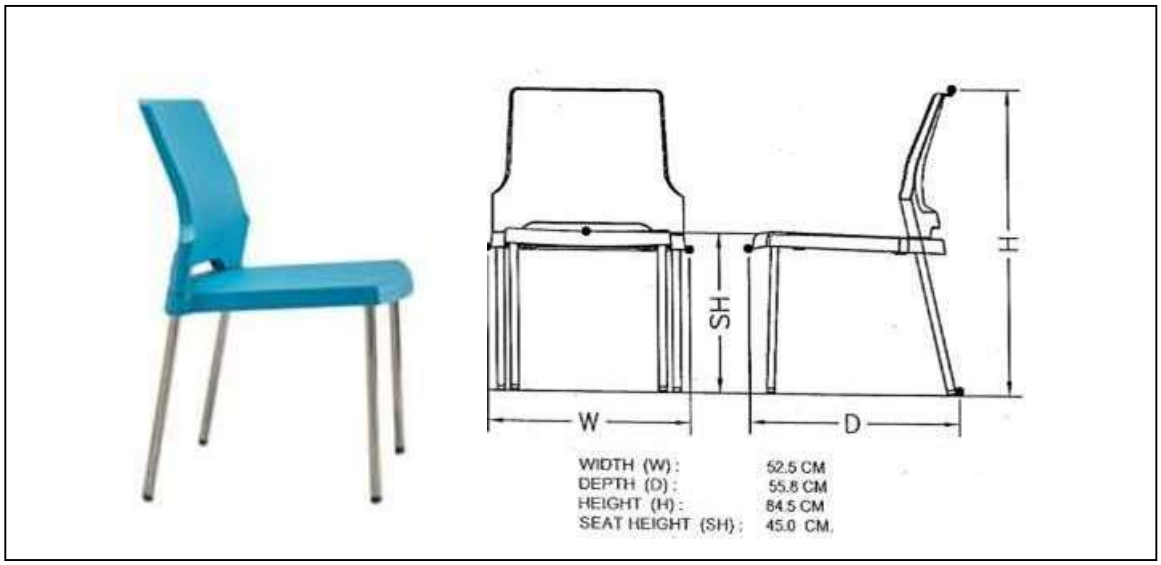
    c. Overall Height :750mm

    d. Net Weight :Minimum 20Kg

25. Computer Chair

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.21 Pg. No. 38

1. Basic Indicative Diagram



2. Confirming to IS CODE10910
3. The seat and back should be made up of injection molded high impact strength polypropylenepolymer compound with indoor grade UV Resistance
4. Dimensions:
    a. Seat Size: 525 mm (W) X 532 mm (D)
    b. b. Back Size: 516 mm (W) X 405 mm (H).
    c. M.S. Powder Coated Under structure: The powder coated (DFT 50+-10 Microns) welded tubular frame should be made from2.22+-0.03 cm X 0.16 +- 0.0128 cm and 3.5+-0.03 cm X 1.5 +- 0.03 cm X 0.16 +- 0.0128 cm M.S. E.R.W tube.
5. Finish: Epoxy Polyester Powder to the thickness of minimum 50 – 60 microns (+/-10).
6. Process: The body including understructure, framework, legs, storage pedestal including fittings involves an 8 step powder coating process consisting of antirust surface treatment viz. Hot water rinse, Knock of degreasing, degreasing, cold waterrinse, phosphating, cold water rinse, passivation, dry off oven treatment and finished with powder coating using epoxy polyester powder of 50 – 60 microns (+/-10). The material is then oven baked with a controlled temperature of 180 deg.C to 200 deg.C.
7. Tests: The powder coating treatment shall strictly comply with IS:13871 (1993) inclusive of method of tests i.e. Dry film/ coating thickness, Finish, Gloss 60°, Colour retention, Scratch hardness, Impact resistance test, Conical Mandrel test, Erichsen cupping test, Pencil hardness, DFT measurement, Salt spray test, Adhesion Cross cut test, Rub test with MEK, Protection against humidity, Resistance to boiling water, lubricating oil, petrol, heat double bake, bleeding, detergents, acid/ alkali. The test reports shall be submitted along with the tender. The finishing processes given are generalized. Need to consider wherever it is applicable as perthe Specs. Of the product.
8. Colour: Blue/ Red/ Yellow Chair Seat and Back Color- Blue/ Red/Yellow. Final colour combination will be decided by DVET.
9. Manufacturing Process: The complete unit shall be as per manufacturer's specifications and Flow chart of manufacturing process shall be submitted along with the tender. Raw materials (Wood working): 1) Plain Particle Board (PPB), 2) Medium Density Fiber Board (MDF), 3) Pre-laminate Board (PLB), 4) Decorative Laminate (DL), 5) Fabric and 6)Lipping (PVC lipping). Process (Woodworking): MDF board from approved supplier Wood Cutting (cutting from mother board 600mm x 2400mm sheet to the desired size on Panel saw machine with no sharp edges, no glue marks, no scratches, no machine

marks and no cracks at drill hole) Lamination (Hot lamination adhering Decorative laminateto MDF board using approved make adhesive) Sizing/ Routing (fine sizing and setting curvilinear shapes) Lipping/ Edge banding (adhering PVC lipping on MDF board using hot melt glue under heat and pressure) Finishing Assembly and Packaging (carcase/ panel assembly, final inspection/ correction if required, packing and dispatch).

10. Raw materials (Metal working): 1) Stainless Steel (Nickel and Chromium added to prevent steel from rusting), 2) Mild steel and 3) Epoxy polyester powder (for powder coating).
11. Process (Metal working): CRCA sheet from approved supplier Notching (cutting at the edge and punching holes, shearing, turret punching/ press operation, debarring of punched sheet) Metal forming (blending for the purpose of different applications, sheet bending) Assembly/Sub-Assembly (for welded all components get assembled and for knock down sub-assembly takes place. CO2 welding and spot welding is done) Pre-treatment (8 step process including anti-rust surface treatment) Powder coating (surface coating applied in the form of powder and oncuring produces a protective coating, examination of test coating specimen for blisters, flaking and corrosion) Assembly and Packaging (car case/ panel assembly, final inspection/ correction if required, packing and dispatch).
12. Raw materials (Metal working): 1) Aluminum Extrusion.
13. Process (Metal working): Aluminum Extrusion from approved supplier -> Cutting of Aluminum extrusions to desired size -> Assembly and Packaging (car case /panel assembly, final inspection/correction if required, packing and dispatch). The manufacturing processes given are generalized. Need to consider wherever it isapplicable as per the Specifications of the product.
14. All raw materials for manufacturing process shall be as per relevant IS code.
15. Size and Weight:
    a. Overall Length: 525mm
    b. Over all Depth: 558mm
    c. Over all Height: 845mm
    d. Net Weight: Minimum 5 Kg

26. Table for Server, Printer

As Per DVET, Maharashtra State, SPECIFICATION FOR ICTSM Item No. 86 Pg. No. 103

1. Basic Indicative Diagram

2. This type of stand turns up in modern simplicity aesthetic and provides sufficient spacefor printers, monitors and corresponding accessories such as printing papers.

3. Convenient to Move around Each supporting feet is fitted with a swivel caster on itsbottom, which allows the entire printer stand to be easily moved to any corner of the room.And all the castes have lock mechanism that is used to keep the stand still once it's been placed at the demanded spot.

4. Easy to Assemble]With the help of the user manual that clearly shows every part of thisproduct and every step of the assembly, you could put the pieces together on your own at ease,without costing much time.

5. Extra-strong Frame In addition to the wood part, the whole frame of this item is made ofquality round steel tubes connected by elaborate welding process and steel screws, astonishingly strong and stable. Coated with premium black paint, the steel structure are rust- proof and elegant.

6. Compact and Space-saving Built in a size of 19"x16"x18"(L*W*H), this printer stand will not take up much space. Due to the compact shape, it can nearly be placed at anywhere asneeded, effectively improving your working efficiency.

27. LCD Projector/OHP

As Per DVET, Maharashtra State, SPECIFICATION FOR DRAUGHTS MACHINICAL Item No.23 Pg. No. 43

1. Basic Indicative Diagram

2. Display : LED, HD Ready (1080p) | (1280 x 720) Native Resolution | 2000 : 1 High Contrast Ratio | 4.57 m (180 inch)Large Screen Display

3. Lumens: 2000 Lumen | 360 ANSI Lumen | LED- Life Long Lamp + 30000 Hours Life | 2000 : 1 High Contrast Ratio + 16:9Aspect Ratio

4. Connectivity: 2 xHDMI | USB | VGA | AV | SD Card Slot | 5. Audio Out Sound : In-Built Speaker (Box Speaker) | 5 Watts Output

5. Smart Features: Android 6.0 / Quad Core / 1 GB / 8GB Rom / Wi-Fi / Bluetooth 4.0 / Wireless Screen Mirroring fromAndroid & iOS devices

6. Important Features: 4D Digital Keystone (40 degree): Place the projector at any convenient corner of your room & stillhave the perfect rectangular image. Digital Zoom: With a click of a remote, you can Zoom in & Zoom Out the image.

28. External storage Device { 1TB}

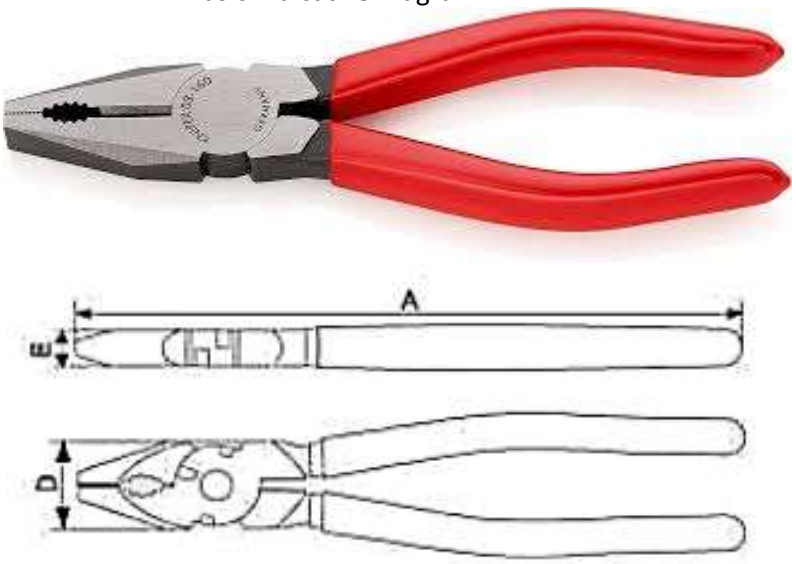
1. Basic Indicative Diagram

2. Capacity: 1TB,
3. Scope of application: mobile phone / computer / camera / drone / navigator Interface:
4. No driver, plug and play, hot swap
5. Boot: Enable USB ZIP/HDD boot support.
6. Data Retention: Data is retained for at least 10 years
7. Resistance: 1000000 times rewritable
8. Power: Bus-powered USB (4.5V~5.5V)
9. Working current: Working temperature: 0°C ~ 60°C
10. Storage temperature: -20°C ~ 85°C

29. Combination Plier Insulated 200 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Wireman Item No.8 Pg. No. 8

1. Basic Indicative Diagram

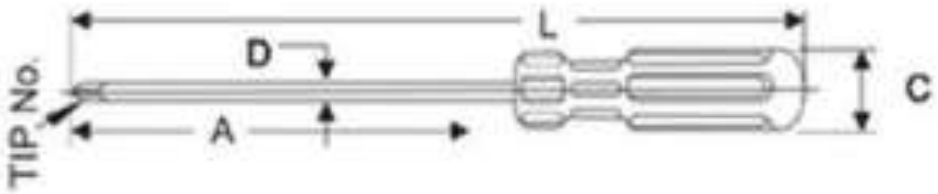


2. Generally conform to IS 3650 - 1981
3. Material: C - 70
4. Finish: Polished / Chrome plated / satin finish
5. Length (A): 200 mm
6. Drop forged, hardened tempered Differential hardening
7. Radius Gap from front side: Up to 0.2 mm
8. Play between shanks: Up to 0.3 mm
9. Shank Material: C70 / EN9
10. Rivet material: SAE 1541 / 40Cr4
11. Cutting Edge Hardness: 60 - 62 HRC
12. Shank Hardness: 40 - 48 HRC
13. Rivet Hardness: 38 - 42 HRC
14. High Voltage Insulation: Should be able to withstand 4000 V DC or 2800 V AC
15. Insulation Sleeves made from High Quality CA Plastic
16. Thicker Sleeves for comfortable Grip
17. Special thumb protector for sleeves to minimize the risk of electric shock in case plier slips while in use.
18. Should be able to cut soft (74 to 84 Kg/mm^2) & hard (140 Kg/mm^2) wires
19. Should be able to cut 2 mm of hardwire Diameter & 1 mm of soft wire Diameter

30. Screw Driver Insulated 4mm X 150 mm, Diamond Head

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.3 Pg. No. 12

1. Basic Indicative Diagram

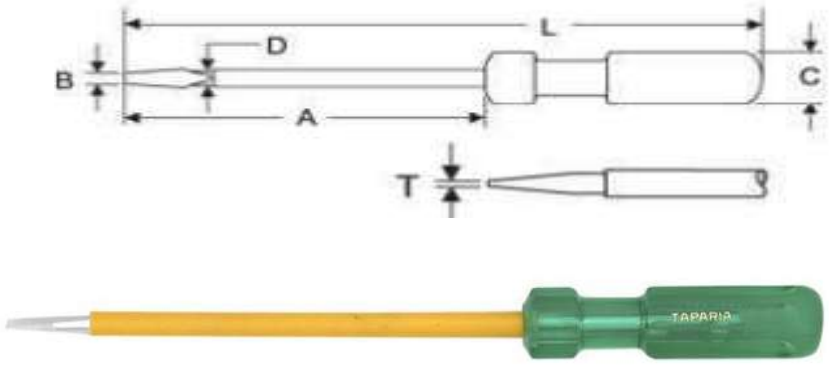


2. Generally conform to IS 844 – 1979
3. Insulated Blade
4. Blade made of High Grade Silicon - Manganese Steel
5. Blade should be differentially hardened & tempered to resist wear, bending & meet high torque requirement
6. Size A: 150 mm D: 4 mm TIP – Diamond Head
7. The Blade tip should be magnetized to lift small screw from confined places or to hold the screw in position
8. Hardness on Tip: 55-58HRC
9. Bright and Smooth Nickel Chrome plating finish to effectively protect blade against corrosion
10. Handle should be made of high grade CA Plastic, which is nonflammable & unaffected by oil, petrol, grease, water- practically anything
11. Handle should with stand rough use in cladding hammering
12. Handle design should be such that it gives comfortable grip even at higher torques

31. Screw Driver Insulated 6mm X 150 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.4 Pg. No. 13

1. Basic Indicative Diagram



2. Generally conform to IS 844 – 1979
3. Insulated Blade
4. Dimensions:

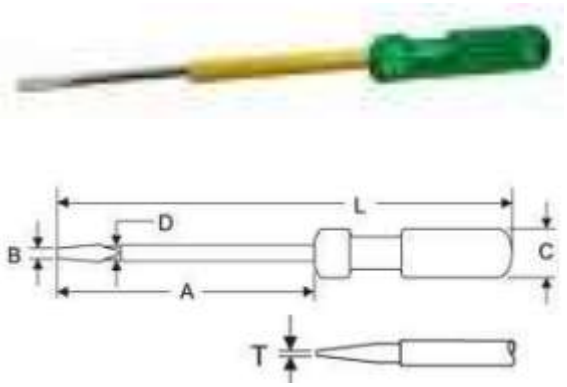
a. Size: 6 mm X 150 mm (A - 150 mm, D - 6 mm)
b. Tip Bit Size: B X T: 6 X 0.8 mm

5. Blade: Blade made of high grade Silicon - Manganese Steel (EN 45 A). Blade should be differentially hardened & tempered to resist wear, bending & meet high torque requirement Hardness on Tip: 55 - 58 HRC
6. Minimum Torque Value: 0.39 Kg.m
7. Bright and Smooth Nickel Chrome plating finish to effectively protect blade against corrosion
8. Handle:
    a. Material of Handle: Cellulose Acetate
    b. Handle should be made of high grade CA Plastic, which is non - flammable & unaffected boil, petrol, grease, water - practically anything
    c. Handle should withstand rough use including hammering
    d. Handle design should be such that it gives comfortable grip even at higher torques
9. Handle & blade assembly should be insert molded
10. Tip: Tip should be formed by Forging & Trimming . Tip should be precision - ground to 10 degree angle to ensure firm grip in the screw slot. The Blade tip should be magnetized to lift small screw from confined places or to hold the screw in position. Tip sides & faces should be well ground with good finish
11. Double ear coining should be provided for the blade

32. Electrician screw driver thin stem insulated handle 4mmX100 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.5 Pg. No. 14

1. Basic Indicative Diagram

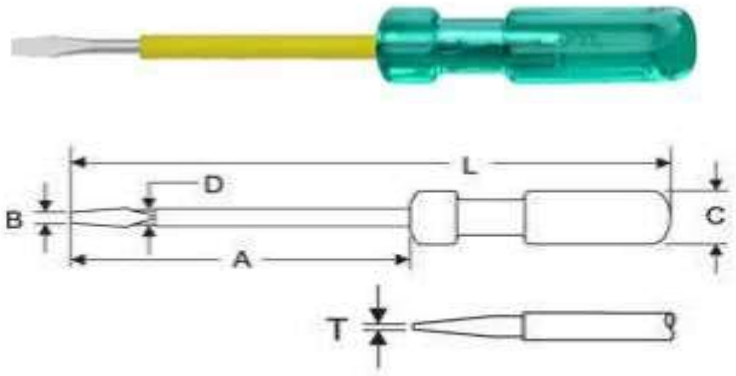


2. Generally conform to IS 844 - 1979
3. Insulated Blade
4. Dimensions:
    a. Size: 4 mm X 100 mm (A - 100 mm, D - 4 mm)
    b. Tip Bit Size: B X T: 6 X 0.8 mm
5. Blade:
    a. Blade made of high grade Silicon - Manganese Steel (EN 45 A)
    b. Blade should be differentially hardened & tempered to resist wear, bending & meet high torque requirement
    c. Hardness on Tip: 55 - 58 HRC
    d. Minimum Torque Value: 0.39 Kg.m
    e. Bright and Smooth Nickel Chrome plating finish to effectively protect blade against corrosion
6. Handle:
    a. Material of Handle: Cellulose Acetate
    b. Handle should be made of high grade CA Plastic, which is non - flammable & unaffected by oil, petrol, grease, water - practically anything
    c. Handle should withstand rough use including hammering
    d. Handle design should be such that it gives comfortable grip even at higher torques
7. Handle & blade assembly should be insert molded
8. Tip:
    a. Tip should be formed by Forging & Trimming
    b. Tip should be precision - ground to 10 degree angle to ensure firm grip in the screw slot.
    c. The Blade tip should be magnetized to lift small screw from confined places or to hold the screw in position
    d. Tip sides & faces should be well ground with good finish
    e. Double ear coining should be provided for the blade

33. Heavy Duty Screw Driver insulated 5mm X 200 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.6 Pg. No. 15

1. Basic Indicative Diagram

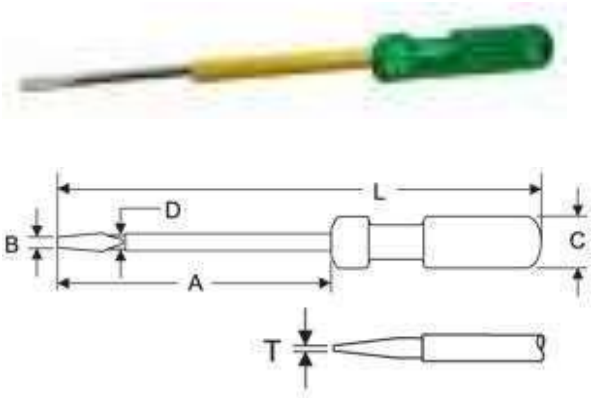


2. Generally conform to IS 844 - 1979
3. Insulated Blade
4. Dimensions:
    a. Size: 5 mm X 200 mm (A - 200 mm, D - 5 mm)
    b. Tip Bit Size: B X T: 5.0 mm X 1 mm
5. Blade:
    a. Blade made of high grade Silicon - Manganese Steel (EN 45 A)
    b. Blade should be differentially hardened & tempered to resist wear, bending & meet high torque requirement
6. Hardness on Tip: 55 - 58 HRC
7. Minimum Torque Value: 1.17 Kg.m
8. Bright and Smooth Nickel Chrome plating finish to effectively protect blade against corrosion
9. Handle:
    a. Material of Handle: Cellulose Acetate
    b. Handle should be made of high grade CA Plastic, which is non - flammable & unaffected by oil, petrol, grease, water - practically anything
    c. Handle should withstand rough use including hammering
    d. Handle design should be such that it gives comfortable grip even at higher torques
10. Handle & blade assembly should be insert molded
11. Tip:
    a. Tip should be formed by Forging & Trimming
    b. Tip should be precision - ground to 10 degree angle to ensure firm grip in the screw slot.
    c. The Blade tip should be magnetized to lift small screw from confined places or to hold the screw in position
    d. Tip sides & faces should be well ground with good finish
12. Double ear coining should be provided for the blade.

34. Electrician Screw Driver thin stem insulated handle 4mm X 250 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.7 Pg. No. 16

1. Basic Indicative Diagram

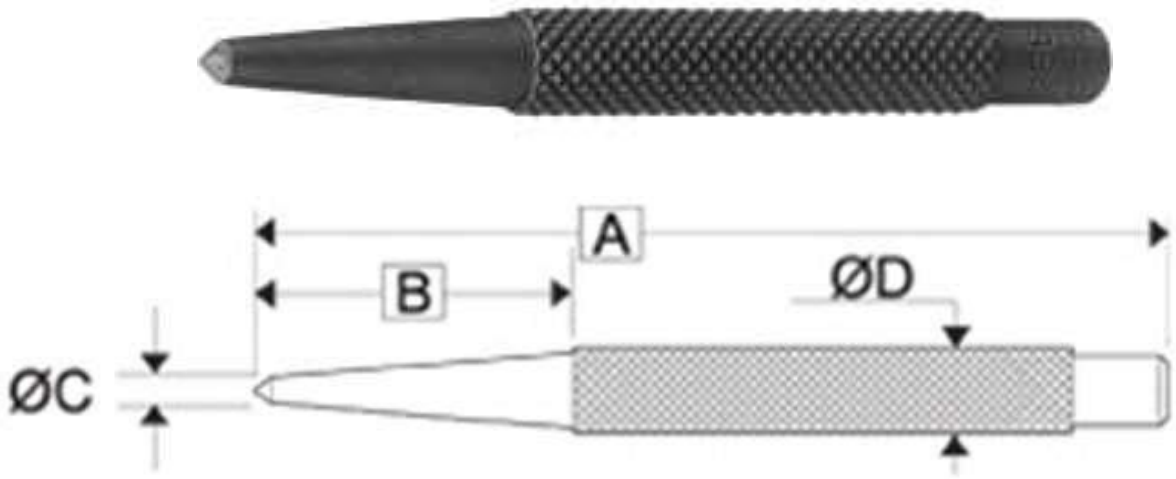


2. Generally conform to IS 844 - 1979
3. Insulated Blade
4. Dimensions:
    a. Size: 4 mm X 250 mm (A - 250 mm, D - 4 mm)
    b. Tip Bit Size: B X T: 4 mm X 0.8 mm
5. Blade:
    a. Blade made of high grade Silicon - Manganese Steel (EN 45 A)
    b. Blade should be differentially hardened & tempered to resist wear, bending& meet high torque requirement
    c. Hardness on Tip: 55 - 58 HRC
6. Minimum Torque Value: 0.50 Kg.m
7. Bright and Smooth Nickel Chrome plating finish to effectively protect bladeagainst corrosion
8. Handle:
    a. Material of Handle: Cellulose Acetate
    b. Handle should be made of high grade CA Plastic, which is non - flammable & unaffected by oil, petrol, grease, water - practically anything
    c. Handle should withstand rough use including hammering
    d. Handle design should be such that it gives comfortable grip even at highertorques
    e. Handle & blade assembly should be insert molded
9. Tip:
    a. Tip should be formed by Forging & Trimming
    b. Tip should be precision - ground to 10 degree angle to ensure firm grip in thescrew slot.
    c. The Blade tip should be magnetized to lift small screw from confined placesor to hold the screw in position
    d. Tip sides & faces should be well ground with good finish
10. Double ear coining should be provided for the blade

35. Punch Centre 9mm X 150 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.8 Pg. No. 17

1. Basic Indicative Diagram



2. Generally, conform to I.S. 7177 - 1974
3. Dimensions (in mm): A - 150, B - 33, Ø C - 4, Ø D - 09
4. Made from high grade chrome Steel
5. Hardness
    a. Working surface: 55 - 57 HRC
    b. Body: 35 - 45 HRC
6. Overall Length: 150mm
7. Black phosphate finish, Hardened & tempered
8. Deep knurling on body for firm grip

36. Knife Double Bladed Electrician 100 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.9 Pg. No. 18

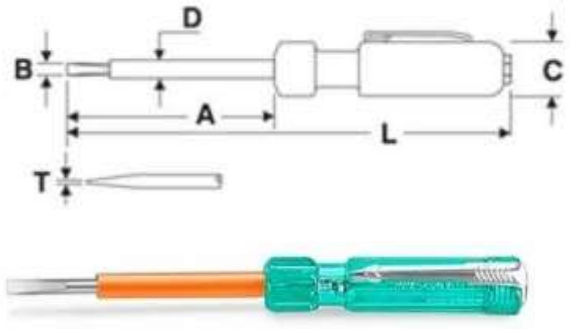
1. Basic Indicative Diagram

2. Blade should be made of high grade Steel for sharp and long cutting
3. Hardness: 62 - 64 HRC
4. ABS Plastic Body for higher strength & soft material for comfort in use
5. Slider locking system for enhanced safety
6. Blade Width: 18 mm
7. Double blade

37. Neon Tester 500 V

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.10 Pg. No. 19

1. Basic Indicative Diagram



2. Generally conforming to IS 5579 – 1985
3. Dimension:
    i. A: 60 mm
    ii. 6 mm
4. Tip Size: B X T = 3.5 mm X 0.5 mm
5. Minimum Torque Value: 0.09 Kg.m
6. Generally conform to IS 5579 - 1985
7. Blade made of high grade Silicon - Manganese Steel (EN - 45A)
8. Blade should be differentially hardened & tempered to resist wear, bending & meethigh torque requirement
9. Hardness on Tip: 55 - 57 HRC
10. Bright and Smooth Nickel Chrome plating finish to effectively protect blade againstcorrosion
11. Handle should be made of high grade CA Plastic, which is non - flammable & unaffectedby oil, petrol, grease, water - practically anything
12. Suitable for checking at minimum 90 V DC and 60 AC voltage and maximum up to 500V AC.
13. Blade is provided with PVC insulation sleeve & resistance having 1 mega ohm for preventing the electric shock.
14. NEON filled glow lamp should give a visible glow in normal day light.
15. Maximum leakage current of 0.12 microampere ensures safe & shock free in use.
16. Tip should be precision - ground to 5 degree angle to ensure firm grip in the screwslot.

38. Hammer, cross peen with handle 250 grams

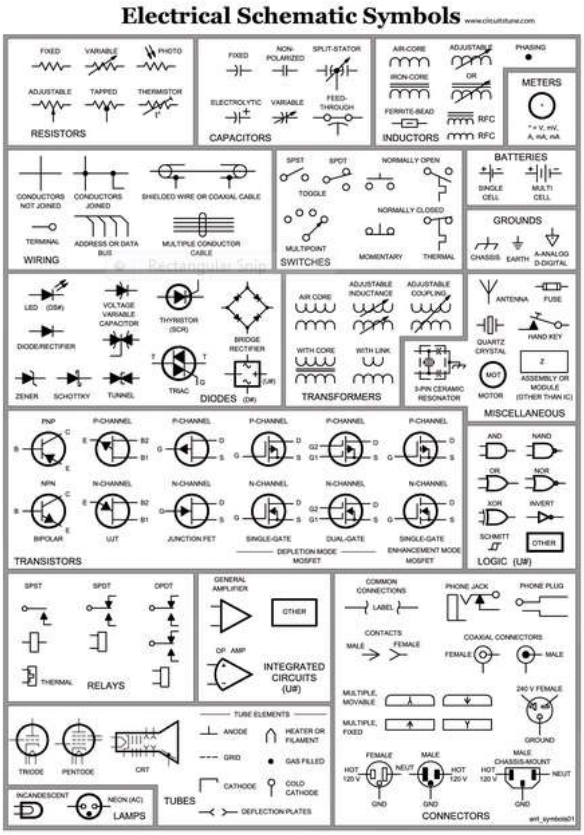
As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.12 Pg. No. 21

1. Basic Indicative Diagram

2. Generally conform to I.S. 841 - 1983 12.3 Cross Peen
3. Weight: 250 grams
4. Drop forged from high grade carbon Steel
5. Partially hardened up to 46 - 56 HRC on striking surface
6. Depth of Hardness: 6.0 mm
7. Phosphated and painted
8. Handle
9. Material: Hickory Wood/ Red Wood/ Babul Wood / Indestructible Handle
10. Handle fixed firmly to hammer head so that it does not come out after long use

39. Electrical Symbol and Accessories Charts

1. Basic Indicative Diagram

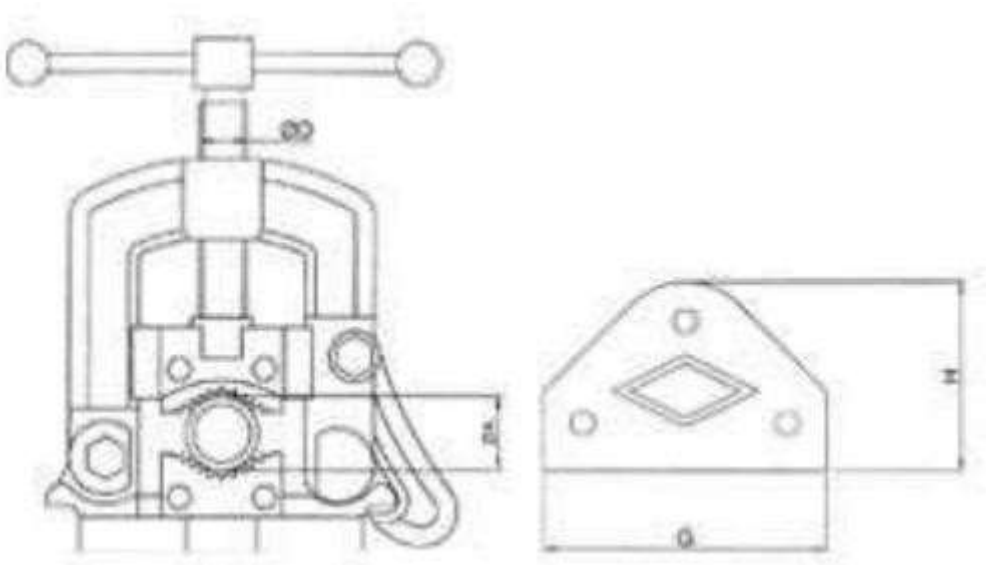


2. Should contains all electrical symbols of accessories.
3. Should have metal frame to showcase it.
4. Print quality should good for easy appearance

40. Pipe vice Cast Iron with hardened jaw open type 100 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Fitter Item No.83 Pg. No. 91

1. Basic Indicative Diagram



2. Generally Conform to 6007 – 1971
3. Nominal Pipe size (L): 100 mm
4. Body should be made of Malleable Cast Iron
5. Jaws should be drop forged & differentially hardened
6. Hardness
    i. Body of the Jaw: 40 - 45 HRC
    ii. Teeth of the Jaw: Above 50 HRC
7. Vertical Upright section of the base is provided with holes for mounting of frame
8. Body of Pipe vice Painted & Jaw Black anodized to guard against rusting

41. Hand Vice 50 mm jaw

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.57 Pg. No. 66

1. Basic Indicative Diagram

2. Total Length: 153mm ±2mm
3. Jaw Width: 50mm±2mm
4. Total Height: 80±2mm
5. Body material: Ductile Cast Iron
6. Spring should easily go up & down
7. Should be used during grinding, hammering etc.

42. Table Vice 100 mm jaw

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.58 Pg. No. 67

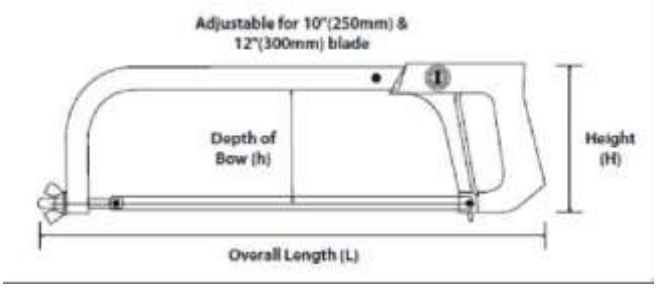
1. Basic Indicative Diagram

2. Total Length : 330mm ±2mm
3. Height : 130mm ±2mm
4. Jaw Width :100mm ±2mm
5. Jaw depth : 55mm±2mm
6. Jaw opening : 130mm +2mm
7. Body should be made from shock resistant Cast Iron & should be free from sand holes. Malleable Steel nuts for extra tuff grip.
8. Jaw made of special carbon Steel (properly heat treated grinded).
9. Clamping force: 2200Kgf

43. A. Hacksaw frame Adjustable 300 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.58 Pg. No. 67

1. Basic Indicative Diagram

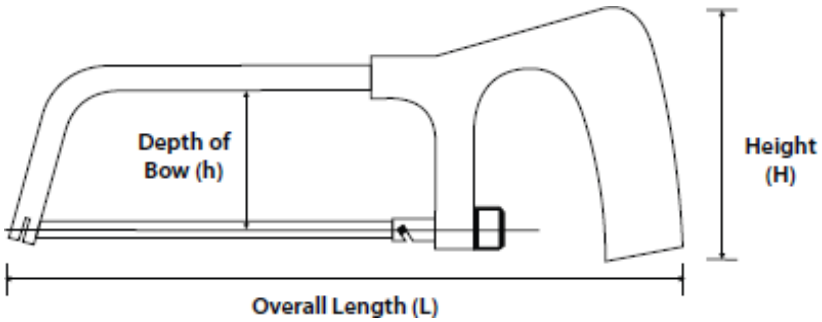


2. Adjustablefor10 inch (250mm) &12 inch (300mm) blades
3. the blade can additionally be set forsawingat90°
4. Storage compartment in the tubular bow should allow for storing spare blades
5. should be fitted with 12" (300mm) Steel hacksaw blade
6. Overall Length (L): 430mm ±10%46A.7 Height (H): 150mm ±10%
7. Depth of Bow (H): 106mm ±10%
8. Strong Frame
9. should have adjustable tension lever
10. should be able to build 30000 PSI in 12 turns

B. Hacksaw frame Fixed 150 mm

(As Per DVET, Maharashtra State SPECIFICATION FOR MECHANICAL TOOLS AND EQUIPMENTS GROUP ITEMS – VOLUME 03) – (Ver -3/ 2018-19) S.R. No-133 Page No- 139 & As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No.32 Pg. No. 41

1. Basic Indicative Diagram



2. Compact & light weight strong Steel frame
3. Frame should have a blade tensioning device that locks when the correct blade tension is reached
4. should be supplied with a 6" (150mm) carbon Steel blade
5. Pistol Grip handle made of high quality ABS plastic
6. Length (L): 10inch (250mm)
7. Height (H): 4inch
8. Depth of Bow: 2nch (50mm)

44. File flat 200 mm 2nd cut with handle

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 48 Pg. No. 57

a. Basic Indicative Diagram

1. Flat File, 2nd Cut
2. *Size -*

Overall Length in mm	200 mm
Overall width in mm	25 mm
Overall Height in mm	5.8 mm

3. Double cut on sides, single cut on edges.
4. Rectangular in cross section and taper slightly towards point in width.
5. PVC White File Handle Included.

45. File half round 200 mm 2nd cut with handle

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 49 Pg. No. 58

1. Basic Indicative Diagram

2. Half round, 2nd Cut
3. *Size*

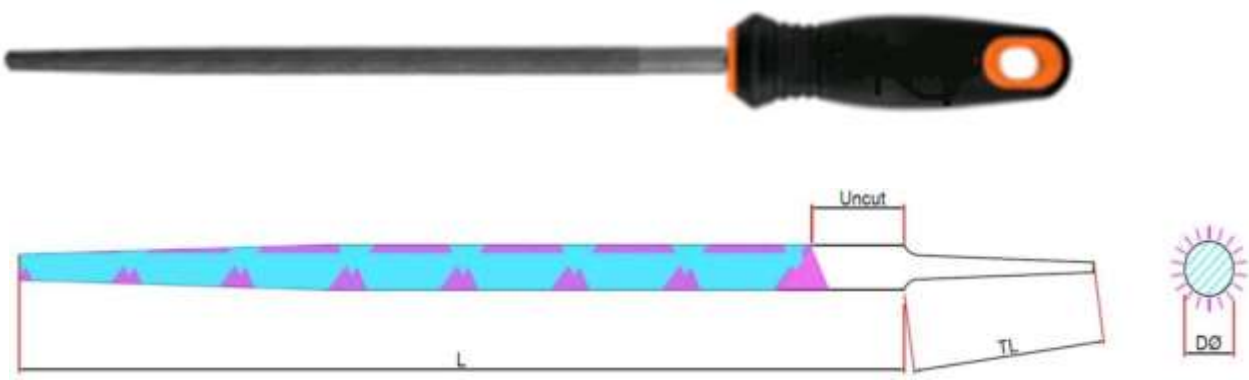
S. NO.	PARTICULAR	DIMENSIONS
1	Overall Length in mm	200 mm
2	Overall width in mm	19.8 mm
3	Overall Height in mm	5.9 mm

4. Double cut on sides, single cut on edges.
5. Rectangular in cross section and taper slightly towards point in width.
6. PVC White File Handle Included.

46. File round 200 mm 2nd cut with handle

(As Per DVET, Maharashtra State SPECIFICATION FOR GENERAL HAND TOOLS – FILES) Version 4 - 2019)
As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 50 Pg. No. 59

1. Basic Indicative Diagram

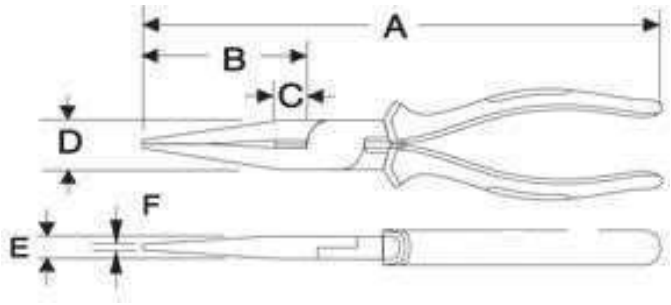


	Range(InMM) From	To
2. Generally conforming toIS1931-2000		
3. Body Length(L)	198	202
4. Tang Length(TL)	55	55
5. Diameter(Ø)	6.35	7.25
5. No. of Up cut/Inch	31	32
6. Up cut inclination	64^0	66^0
7. No. of Overcut/ Inch	31	32
8. Overcut Inclination	49^0	51^0
9. Hardness	60HRC	64 HRC
9. Rake Angle	-7^0	-12^0

47. Pliers long nose insulated 150 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 37 Pg. No. 46

1. Basic indicative diagram

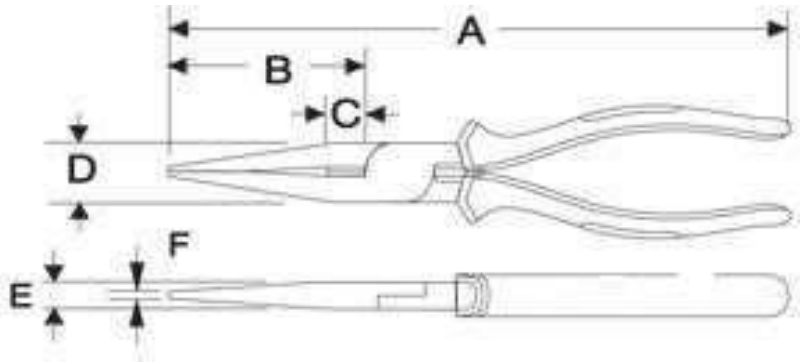


2. Generally conform to is 3552 – 1989
3. Length: 150 mm
4. Drop forged from high carbon steel & scientifically treated to give tough body (45 -48 hrc)
5. Cutting edges should be induction hardened. Cutting edge hardness 55 - 60 hrc.
6. Rivet should be hardened and made of carbon steel
7. High voltage insulation: should be able to withstand 4000 v dc or 2800 v ac
8. Minimum load value: 13.80 kg
9. Insulation sleeves made from high quality ca plastic which are long lasting and willnot break or crack even if it falls from height and ensures safe electrical working.
10. Thicker sleeves for comfortable grip
11. Special thumb protector for sleeves to minimize the risk of electric shock in case plierslips while in use.
12. should be able to cut soft (74 to 84 kg/ mm^2) & hard (140 mm^2) wires
13. Should be able to cut hard wire of diameter: 1.60 mm & soft wire of diameter: 1.0mm
14. Cutting edges should be sharp and precision machined to appropriate angle to cutthick and thin wires with ease

48. Pliers flat nose insulated 200 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 38 Pg. No. 47

1. Basic Indicative Diagram

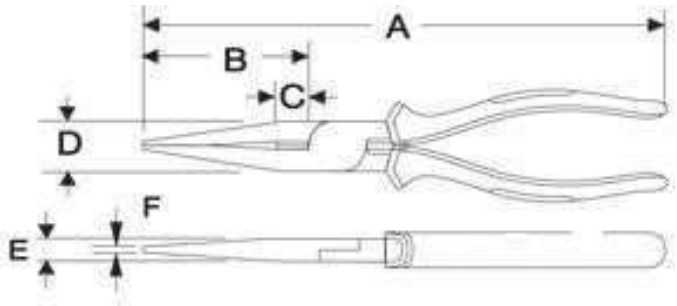


2. Generally conform to IS 3552 – 1989
3. Length: 200 mm
4. Drop Forged from High Carbon Steel & scientifically treated to give tough body (45 -48 HRC)
5. Cutting edges should be induction hardened. Cutting edge Hardness 55 - 60 HRC.
6. Rivet should be hardened and made of carbon Steel
7. High Voltage Insulation: Should be able to withstand 4000 V DC or 2800 V AC
8. Minimum load value: 9.58 Kg
9. Insulation Sleeves made from High Quality CA Plastic which are long lasting and will not break or crack even if it falls from Height and ensures safe electrical working.
10. Thicker Sleeves for comfortable Grip
11. Special thumb protector for sleeves to minimize the risk of electric shock in case plierslips while in use.
12. Should be able to cut soft (74 to 84 Kg/ mm^2) & Hard (140 mm^2) wires should be able to cut Hard wire of Diameter: 1.60 mm & Soft wire of Diameter: 1.0 mm
13. Cutting edges should be sharp and precision machined to appropriate angle to cut Pliersround nose insulated 200 mm

49. Pliers, round nose insulated 100 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Wireman Item No 36 Pg. No. 36

1. Basic Indicative Diagram

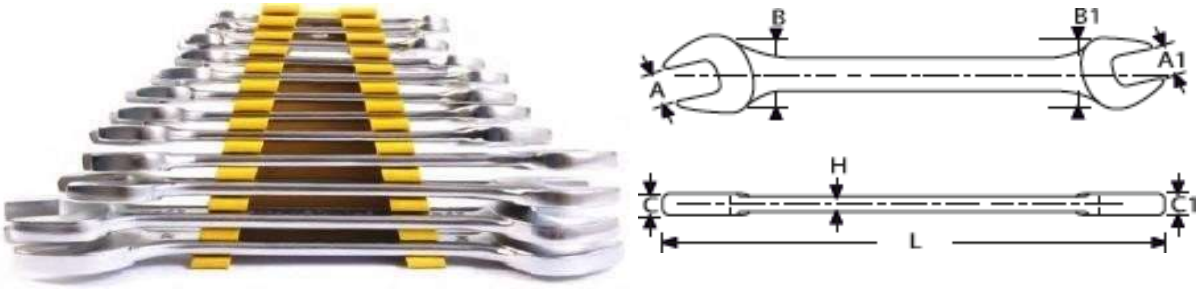


2. Generally conform to IS 3552 - 1989
3. *Length: 100 mm*
4. Drop Forged from High Carbon Steel & scientifically treated to give tough body (45 -48 HRC)
5. Cutting edges should be induction hardened. Cutting edge Hardness 55 - 60 HRC.
6. Rivet should be hardened and made of carbon Steel
7. High Voltage Insulation: Should be able to withstand 4000 V DC or 2800 V AC
8. Insulation Sleeves made from High Quality CA Plastic which are long lasting and will notbreak or crack even if it falls from Height and ensures safe electrical working.
9. Thicker Sleeves for comfortable Grip
10. Special thumb protector for sleeves to minimize the risk of electric shock in case plierslips while in use.
11. Should be able to cut soft (74 to 84 Kg/ mm^2) & hard (140 Kg/ mm^2) wires
12. Should be able to cut hard wire of Diameter: 1.60 mm & Soft wire of Diameter: 1.0mm
13. Cutting edges should be sharp and precision machined to appropriate angle to cutthick and thin wires with ease.

50. D.E. metric Spanner Double Ended 6 - 32 mm

(DVET/MS/Specification MTE/VOLUME-03/Varsion-3/2018 - 19/Sr. No-165/, P. No-172) & As Per DVET, Maharashtra State, SPECIFICATION FOR MMV Item No 14 Pg. No. 22

1. Basic Indicative Diagram

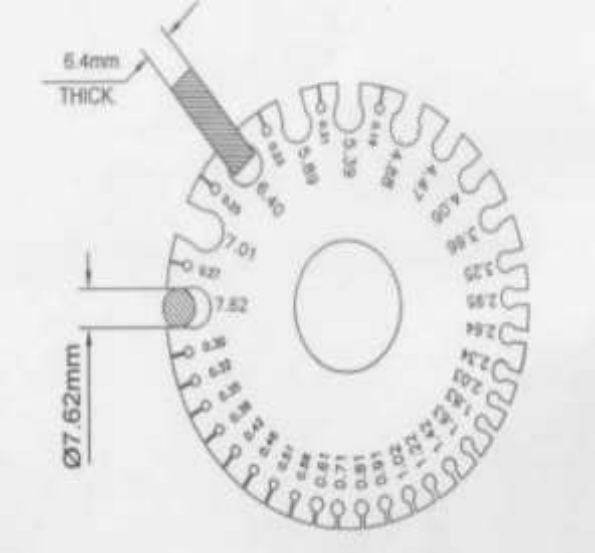


2. Generally Conform to IS2028–1998
3. Sizes:6X7,8X9,10X11,12X13,14X15,16X17,18X19,20X22,21X23,24X27,25X28 , 30X32mm
4. Slightly Rounded handles-Sandblasted
5. Non Damaging Grip on nut due to close wrench opening tolerances
6. I-section design of handle and heads to combine strength and low weight
7. Salt Spray Test should be conducted
8. Should not have Sharp Cuts, Pit Marks, Cutting Burs
9. Should have Anti –Slip design Feature
10. Thoroughly corrosion protected with Nickel chrome finish
11. Deep forged from Chrome vanadium Steel(31CrV3)
12. Hardness:42-45HRC
13. Head at each end are of different sizes and set at an angle of 15 degrees
14. Web should be provided in forging
15. Minimum Torque Value sin Kg.m
16. Nominal Width A/F 6-0.6, 7-0.9, 8-1.3, 9-1.9, 10-2.5, 11-3.3, 12-4.2
    Nominal Width A/F 13-5.3, 14-6.5, 15-7.8, 16-9.4, 17-10.9, 18-13.0
    Nominal Width A/F 19-15.2, 20-17.50, 21-20.20, 22-22.9, 23-26.0, 24-29.3
    Nominal Width A/F 25-32.8, 26-36.6, 27-40.7, 28-45.0, 30-54.6, 32-65.50

51. Wire Gauge – Metric Gauge, wire imperial stainless steel marked in SWG & mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 47 Pg. No. 56

1. Basic Indicative Diagram



2. Material: Stainless - X12CrMnNiN18-9-5
3. Thickness: 1.0 mm
4. Hardness: 30-35 HRC (Specially Hardened)
5. Finish: Polished 2B / Antiglare Satin Chrome
6. Surface roughness: 0.6 microns max
7. Range: 0-36 SWG (incremental of 1 gauge)
8. Measuring least count: 36 SWG - Standard Wire Gauge (0.19 mm)
9. Accuracy: +0.05 mm
10. Should be supplied in Wooden / Plastic Box with proper cushioning

52. Portable Electric Drill Machine 0-12 mm capacity 750W, 240V with chuck and key

(As Per DVET, Maharashtra State SPECIFICATION FOR MECHANICAL TOOLS AND EQUIPMENTS GROUP ITEMS – VOLUME 04) – (Ver -3/ 2018-19) S.R. No-02 Page No- 05

1. Basic Indicative Diagram

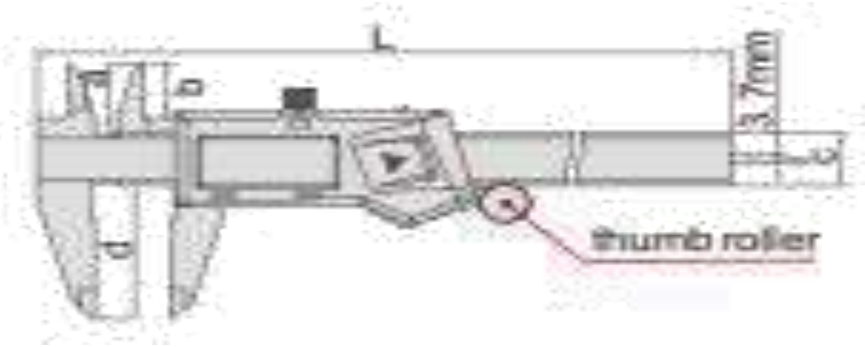
2. Drilling machine should generally conforming to IS: 36501-1981.
3. Power Input : 750 Watt min.
4. Drilling Diameter:
    a. Concrete: 13 mm
    b. Steel: 10 mm
    c. Wood: 25mm
5. No load Speed: 0 – 2800 rpm
6. Impact rate: 25000bpm
7. Should have soft in line grip for a secure hold
8. Should have Rotating brush plate for constant power in reverse and forward rotation
9. Should have Forward/Reverse rotation for inserting and removing screws
10. Should be able to have Easy and precise control of the RPM-variable speed
11. Should have double insulation–shock proof fiber body
12. Dimensions:
    a. Overall Length in mm(±10%): 275mm
    b. Overall Height in mm(± 10%): 180mm
    c. Net Weight (without cable &blade)(±10%.): 1.7kg
13. Protection Class: Double Insulation
14. Standard Accessories
    i. Auxiliary handle = 01 no
    ii. Blow molded plastic case to securely fit all pieces for easy organization andconvenient portability = 01 no
    iii. Depth gauge = 01 no
    iv. Spirit level (225 mm) with 3 spirit bulbs(horizontal, vertical & angular leveltesting)
    v. Knife (Length - 150 mm, Blade width 15 mm) = 01 no

vi. Claw Hammer (Weight 340 grams) = 01 no
vii. Adjustable Wrench (Length 150 mm, Maximum jaw opening 19 mm) = 01 no
viii. Combination Plier (Length 160 mm, Maximum jaw opening 25 mm) = 01 no
ix. Measuring tape (Length 3 meter, 11 mm tape width) = 01 no
x. Drill bits
    1. Masonry: 05 no
    2. Wood: 04 no
    3. HSS: 05 no
    4. CRV Bit: 10 no
xi. Magnetic Bit Holder: 01 no
xii. Socket: 7 no
xiii. Socket Adaptor: 1 no
xiv. Assorted Screws: 30 no
xv. Assorted Plastic Plugs: 30 no

53. Digital Vernier Caliper Universal Type 0-150 mm LC 0.005 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Fitter Trade Item No 155 Pg. No. 169

1. Basic Indicative Diagram

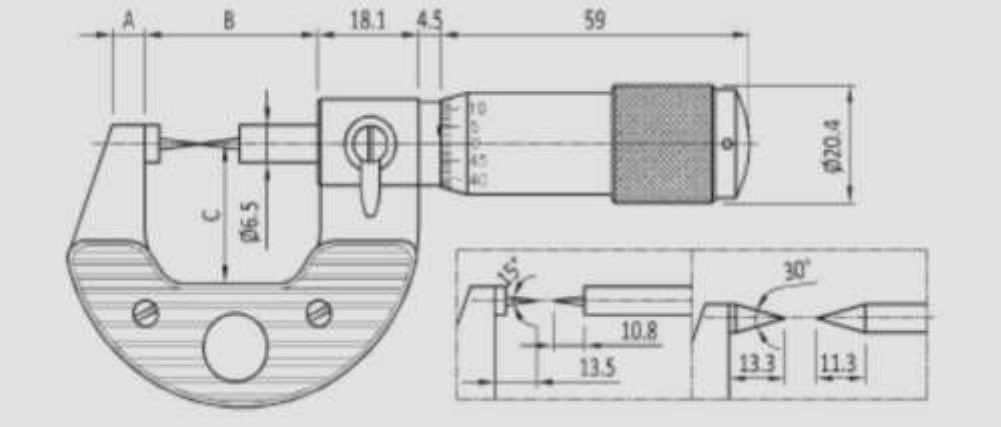


2. Compliance: Should generally comply with DIN 862 standards
3. Material: Stainless steel
4. Length: 240 mm (+ 5%)
5. Resolution: 0.01 mm
6. Range: 0 - 150 mm
7. Accuracy: 0.03 mm
8. Should be supplied with thumb roller
9. Buttons: On or Off, Zero, mm or inch
10. Automatic Power Off
11. Can turn on Power by moving the digital unit
12. High moving speed should be allowed
13. Should have facility of USB data output
14. Standard Accessories:
15. Operating Manual
16. Wooden / Plastic Box with proper cushioning

54.Screw thread Micrometer with interchangeable. Pitch anvils for checking metric threads 60 degree

As Per DVET, Maharashtra State, SPECIFICATION FOR MECHANICAL MEASURING EQUIPMENTSGROUP ITEMS - Version 3--2018-19 - Sr. No -57 Page no 60 & As Per DVET, Maharashtra State, SPECIFICATION FOR Fitter Trade Item No 153 Pg. No. 167

1. Basic Indicative Diagram:



2. Compliance: Generally Compliant to DIN 863
3. Range: 0 mm - 25 mm
4. Reading: 0.01 mm
5. Accuracy: 4 µm
6. Point angle of spindle in Degree: 30 Degree
7. Material: Stainless Steel / Alloy Steel
8. Standard Accessories:
    a. Suitable spanner
    b. Wooden / Plastic Box with proper cushioning
    c. Operating Manual

55. Depth Micrometer 200 mm

As Per DVET, Maharashtra State, SPECIFICATION FOR Fitter Trade Item No 154 Pg. No. 167

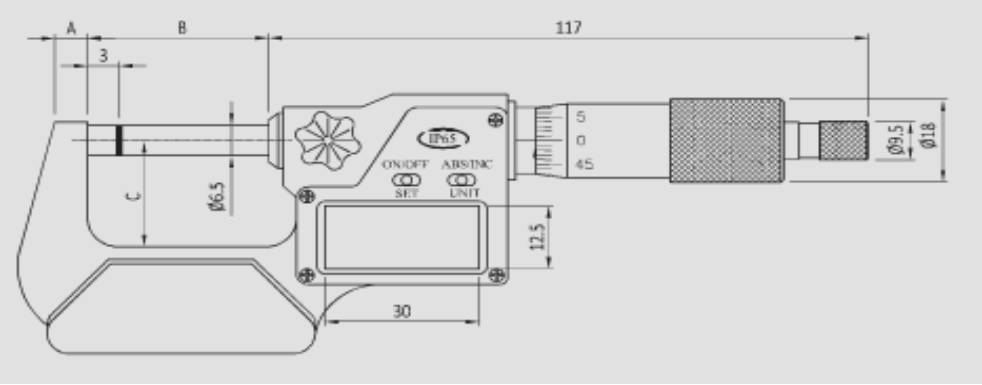
1. Basic Indicative Diagram

2. Interchangeable rods provide a wide measuring range
3. Highly accurate interchangeable rods exclude the necessity of reset when rodsare
4. Being changed
5. Resolution is 0.01mm
6. Base length is 100mm
7. Includes 6 rods for measurement of 0-200 mm
   Extension rods Size
   1) 50-75, 2) 75-100, 3) 100-125, 4)125-150, 5)150-175, 6)175-200 Meet DIN863-2
8. Graduation 0.01mm
9. Micrometer head accuracy: +/-3µm
10. Rod accuracy: +/- (2+L/75) µm, L is the measuring range in mm 1
11. Rods with flat end
12. Ratchet stop
13. Finish Micro chromium steel plated
14. Wooden / Plastic Box with proper cushioning

56. Digital Micrometer outside.0 - 25 mm L.C. 0.001 MM

As Per DVET, Maharashtra State , SPECIFICATION FOR MECHANICAL MEASURING EQUIPMENTSGROUP ITEMS - Version 3--2018-19 - Sr. No -47Page no 50 & As Per DVET, Maharashtra State, SPECIFICATION FOR Fitter Trade Item No 156 Pg. No. 170

1. Basic Indicative Diagram



.

2. Compliance: Generally Compliant to DIN 863
3. Range: 0 mm -25 mm
4. Reading: 0.001 mm
5. Accuracy: 4 µm
6. Protection level against dust and water: IP 65
7. Material: Stainless Steel / Alloy Steel
8. Standard Accessories
    i. Suitable spanner
    ii. Should be supplied in Wooden / Plastic Box with proper cushioning

57. Digital Vernier caliper 0 - 200 mm L.C. 0.01 mm (Optional)

As Per DVET, Maharashtra State, SPECIFICATION FOR MECHANICAL MEASURING EQUIPMENTSGROUP ITEMS - Version 3--2018-19 - Sr. No -61 Page no 64 & As Per DVET, Maharashtra State, SPECIFICATION FOR Fitter Trade Item No 160 Pg. No. 173

1. Basic Indicative Diagram

2. Compliance: Should generally comply with DIN 862 standards
3. Material: Stainless steel
4. Length: 285 mm (+ 5%)
5. Resolution: 0.01 mm
6. Range: 0 - 200 mm
7. Accuracy: 0.03 mm
8. Should be supplied with thumb roller
9. Buttons: On or Off, Zero, mm or inch
10. Automatic Power Off
11. Can turn on Power by moving the digital unit
12. High moving speed should be allowed
13. Should have facility of USB data output
14. Standard Accessories:
    i. Operating Manual
    ii. Wooden / Plastic Box with proper cushioning

58. Pillar Type Drilling machine Sensitive 0-20 mm cap. With a swivel table Motorized with chuck & key.

As Per DVET, Maharashtra State, SPECIFICATION FOR Fitter Trade Item No 176 Pg. No. 194

1. Basic Indicative Diagram

	PARAMETER	SPECIFICATION	REMARK
2	Drill capacity in M.S	20 mm	
3	Taper in Spindle	MT-3	
4	Spindale Travel	Min 100 mm	
5	Nos of Spindale speed	5-10 nos	
6	Range of Speed	50-150 to 1200-2500 RPM	
7	Pillar Diameter	Min 90 mm	
8	Pillar length	Min 1100 mm	
9	Distanced between center of spindle& Pillar front	250 to 300 mm	
10	Max. distance between spindle &table	Min 500 mm	
11	Max. distance between spindle &base	1000 to 1100 mm	
12	Table working surface (Square orRound)	Square 370-400x370-400 OR Round Min dia 300 mm	
13	Base working surface	275-300 to 350-400 mm	
14	Overall size of base	370-400X550-600mm	
15	Motor	1HP-2HP ISI Specification	
16	Coolant pump	0.1 KW	
17	STANDARD ACCESSORIES		
17.1	Drill Chuck 16mm with arbor & key	1 no	
17.2	Machine vice swivel type	100mm	
17.3	Coolant systems suitable for machine	std	

17.4	Co-ordinate table	
17.5	Reversing switch equipment	
17.6	Boring Head	
17.7	Tool Tray	
17.8	Drill Reduction sleeve	
17.9	Quick positioning vice	
17.10	Drill collect for quick change chuck	
17.11	Quick change chuck	
18	OTHER STANDARD ACCESSORIES	
18.1	A.C single phase Electric Motor of 1 H P .ISI Brand Fitted with the Machine	
18.2	Switching equipment for the above Motor fitted with Machine	
18.3	Triple Pole interlocked isolator	
18.4	Coolant pump unit with complete fitting fitted with machine	
18.5	Machine light without Lamp	
1836	Suitable lubrication system for manually through oil can	
18.7	V Belt -2 pieces & pulley	
18.8	Drill Drift	
18.9	Tapping Attachment	
18.10	Oil Can	
18.11	Set of Allan keys and spanner set (12 pieces .In each set)	
19	FEATURE	
19.1	The machine should be suitable for Tapping, riming, boring and facing and has min 5 spindle Speed	
19.2	The spindle should be made of alloy steel accurately machined and ground. supported in precision ground alloy steel quill carrying 2 taper roller bearing and spindle has 4-6 splines as per machine tool spline std. and drive through broached sleeve, Properly balance spindle pulleyis mounted on double ball bearings with one bearing each in body cup and bracket for trouble free and long life belt load. Spindle MT bore accuracy should be as per IS2425; 1982 reaffirmed inJan.2005.Spindle should be harden & ground.	
19.3	Independent gear for work and square rack in work table arm for longer and trouble free life.	
19.4	Head should be made from cast iron of grade FG260 accurately machine to ensure perfect parallelism between the column and spindle. The quill carrying spindle is precisely to slide inprecisely honed bore	
19.5	A precision ground column should be made from heavy section seamless steel tube whichensures rigidity and resists deflection	
19.6	Work Table T-slot should be machines as per IS Standard	
19.7	All Moving Parts should be accurately machines and ground to close tolerance	
19.8	Free Preventive maintenance visit for one year as per our requirement	
19.9	On side training for two days and centralized training for one week about machine to trainedour staff	
19.10	The Pillar type drill machine shall comply with the test requirement given in IS 2425:1982ISO2773-1973 reaffirmed in Jan 2005.	

19.11	All the casting used in machine should be of highest grade (cast iron of grade FG 260 IS210)	
19.12	Casting grade & hardness of part should be certified by NABL approved Lab.	
19.13	Handles and levers should be chrome plated main components should be 1excellently surfaceand treated stoving enamel.	

59.Portable CMM

Basic indicative diagram

1. Rugged and accurate CMM designed for a very flexible inspection of 2D/3D forms/profiles with air drier.
2. Ideal for the measurement of internal and external profiles of turned or ground revolution parts
3. The inspection cycle can be easily programmed
4. Designed for high accuracy, repeatability and speed
5. Supports any standard Reni Shaw Standard probe and specialized probe diameter 1mm,2mm,5mm and star probe
6. Full CMM operating software with licence for GD&T measurement, CAD comparison, curve measurement with suitable computer
7. Fully functional free learning edition CMM software shall be provided for student Training.
8. Machine shall be supplied with rigid travel case with universal mount.
9. Training shall be provided by AUKOM certified engineers metrology

Specifications:

Measuring range	1.3m or better
Resolution	Rotary encoders/absolute
Operating temperature	5 to 45°C
Accuracy	22µ or better
Repeatability	8µ or better

60. DC Power Supply - 0 - 30 V, 3 A

As Per DVET, Maharashtra State, SPECIFICATION FOR Electronics Mechanic Trade Item No 40 Pg. No. 46

1. Basic Indicative Diagram

2. Output voltage: 0 to 30 Volt
3. Output Current: 0-3A
4. Load effect: CV≤1×10-4+2mV, CC≤2×10-4+3mA
5. Ripple and Noise: ≤0.3mVrms
6. Output Regulation Resolution: CV: 100mV(Typical), CC: 10mA (Typical)
7. Display Accuracy: 4 digit ≤ ±(0.1% + 5), 3 digit ≤ ±(0.4% + 3)
8. Reliability (MTBF): < 2000 Hours
9. Display: LED should display the voltage and current values
10. Power Input Voltage: 115VAC/ 230VAC (Optional)
11. Frequency: 50Hz/ 60Hz
12. Should be supplied with Power Cord

61. Sensor kit

1. Basic Indicative Diagram

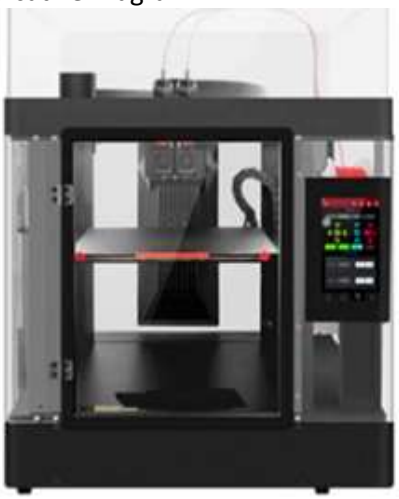
2. IoT enabled Android based 7” Graphical touch LCD with inbuilt cortex processor &
3. DAQ for acquiring analog data and software for viewing the output waveforms with USB storage and HDMI output.
4. Ethernet port to connect real world.
5. Inverting, Non – Inverting, Power, Current, Instrumentation and Differential Amplifier, F to V, V to F, I to V, V to I Converter, High Pass and Low Pass Filter, Buffer, LED, Buzzer
6. Trainer RoHS compliant, compact, lightweight and made of ABS enclosure.
7. It come with technical chart pasted on it to learn and understand more about applications and technical details.
8. The Trainer include the following Sensors: o Thermocouple: K Type Thermocouple, -200°C to 1250°C o RTD - Platinum RTD: 100Ω at 0°C (Temp. coefficient 0.385 Ω /°C) o Load Cell/ Strain Gauge o LVDT o Smoke Detector Sensors: Gas(Smoke) : Methane, Butane, LPG, Smoke o Speed Sensor o Limit Switch o Photo sensors: L14G1 Photo Transistor: 500nm – 1100nm o Opto coupler o Proximity Sensor
9. Trainer to perform following experiments: o Learn the detailed fundamentals of signal conditioning. o Learn in-depth study of sensors and it’s circuit diagram.
10. Learn how automation implement using sensors and actuators.
11. Testing and understanding graph of Thermocouple and photo transistor. o Testing and understanding the working of Amplifiers like inverting amplifier, Non inverting o Amplifier, Differential Amplifier, Instrumentation Amplifier, Current Amplifier o Testing and understanding the working of Filters like High Pass filter and Low Pass Filter o Testing and understanding the working of Types of and Converters like Frequency to Voltage and Voltage to Frequency convertor, Current to Voltage and Voltage to current convertor. o Study of output blocks like LED, Buzzer o Testing and understanding graph of Gas (Smoke), Limit switch, proximity sensor, Opto coupler sensors. o Fault finding to Types of signal conditioning and Sensors. o See the sensor real timer graph using computer based software o Sensors data logging using computer based software o HDMI and Ethernet connectivity.
12. The trainer include ten user Classroom / laboratory teaching, learning and simulation software module on Analog and Digital Electronics & Sensors with following key features: o

The content designed by using platforms like Visual Basic, Dot Net, Flash etc. and useful to understand the basic concepts of various technologies in electronics including advance technologies, the software comprises simulations, animations, videos, graphs, charts, along with mandatory rich content and theory to understand fundamental concepts, interactive learning objects, FAQ, MCQ etc. of Analog and Digital Electronics with following topics: - Sensor, Transducer and actuator - Difference between sensor and transducer - Signal Conditioning: Inverting amplifier, Non inverting amplifier, Differential Amplifier, Instrumentation Amplifier, F to V Convertor, V to F convertor, I to V Convertor, V to I convertor, Current Amplifier, High and Low Pass Filter - Characteristic of different types of Sensors. Working of Sensors like RTD, Thermocouple, Photo Diode, Gas (Smoke), Limit switch, speed sensor, load cell, LVDT, Opto coupler and Proximity Sensor.

Sensor Kit :		1 set
I. Mounting Plate		
II. Power Distribution Box	(24V DC, 4A)	
III. Counter Box	(10-30V DC/0.05A)	
IV. Indication Box	(24V Dc)	
V. Material Box		
VI. Inductive Sensor	(10-30 V DC, PNP, NO, 5mm (Range))	
VII. Capacitive Sensor	(10-30 V Dc, PNP, NO, 2-8mm(Range))	
VIII. Magnetic Sensor	(10-60 V DC , PNP, NO, 60mm (Range))	
IX. Ultrasonic Sensor	(20-30 V DC, PNP, NO, 80-300mm(Range))	
X. Connecting Wires		

62.3D printer- with continuous filament fabrication (CFF)

i. Basic Indicative Diagram



1. Build Volume 320 mm x 132 mm x154 mm with z resolution – 100 microns
2. Software – Cloud based slicing software like Eiger/ Cura or similar Software for printing composite materials.
3.

Continuous Filament Fabrication (CFF) Printer Technology: Qty – 01

TECHNICAL SPECIFICATION OF 3D PRINTER	
Build volume	300 x 250 x 300 mm
Print Accuracy	0.05-0.2mm
Print Speed	60mm/s
Nozzle Diameter	0.4mm
Extruder Temp	<=350°C
Extruder Quantity	2 numbers High temperature single extruder x1 Ordinary single extruder x1
Support Material	PA12-CF, PLA, ABS, TPU, PETG, NYLON, PC
Connection Options	WIFI/LAN/USB Pen Drive
Support	Windows 64 bit/Mac
Compatible Software	QidiPrint/Cura/Simplify 3D or equivalent to this software
Voltage	110-220V
N.W.	32.5KG
Package Size	58 x 64 x 68cm/22.8 x 25 x 26.7in
Package Weight	38KG/83.7lbs
Machine Dimensions	610 x 515 x 675 mm (Minimum Size)
Print accuracy	50- 200 microns
Layer thickness	50 microns
Axis movement	Through linear guide rails
Extruder type	Twin gear direct drive extruder
Display	5 inch HD capacitive display
Type of sensors	Filament run out sensor and double z setpoint sensor
Bed type	Automatic bed leveling
Build plate surface	Pei plate
Noise Emission (Acoustic)	< 50 dB (A) when building
Layer Height	0.02-0.25 mm
Filament Diameter	1.75mm (minimum)
Machine Code Type	G CODE

Power Loss Recovery	Resume print function
Type of drivers	Cortex-M4 and TMC2209 driver chip

A 3d printer specially designed for printing carbon fiber and nylon filaments. Independent research and development of the latest generation single extruder system, which uses high-temperature alloy material, dual-gear extrusion, can solve the problem with the accuracy and the service life when printing carbon fiber. Another set of normal high-speed extruder can easily print PLA, ABS, PETG and other filaments

63.3D Printer- FFF (Fused Filament Fabrication)

1. Basic Indicative Diagram

Fused Filament Fabrication (FFF) Printer Technology

TECHNICAL SPECIFICATION OF 3D PRINTER	
Build Volume	400*350*500mm (YXZ)
Layer Height	0.05mm-0.4mm
Printing Accuracy	±0.2mm
Printing Speed	10-200mm/s
Print Technology	FFF (Fused Filament Fabrication)
Maximum Platform Temperature	120℃
Maximum Chamber Temperature	60℃
Extruder	IDEX (Independent Dual Extruders)
Extruder Type	Direct Drive Extruder
Nozzle Diameter	0.4mm (default); 0.6/0.8mm (optional)
Maximum Extruder Temperature	360℃
Supported Filament	TPU, PLA, PVA, PETG, TPU 98A, ABS, PP, PA, PC,PA12-CF,PET-CF etc.
Supported Format	Input: 3MF/STL/OBJ/FPP/BMP/PNG/JPG/JPEG; Output: GX/G
Connectivity	USB flash drive/Ethernet/Wi-Fi
Touch Screen	7-inch HD display screen
Appropriate Temperature for Printing	≥ 12-24℃
Appropriate Humidity for Printing	20-70RH%
Power	2320W
Power Supply Input	AC 100-130V/200-240V; 50-60Hz
OCP (over-current protection)	30A
Net Weight	80 to 100kg (minimum)
Printer Size	800 Y *600X* 900 mm Height (Minimum Size)

Must be Powerful Commercial Grade 3D Printer with advanced printing configurations and temperature controls.
Capable of 3D printing engineering materials such as flexible, nylon, and carbon fiber composite.
Open filament system that supports customization
Interchangeable Independent Dual Extruder System (IIDEX)

Unlike traditional dual extruder system, IIDEX provides high outputs for mass production, oozing free prints, and high quality prints for meeting demands of projects.

64.3D Printer- with Direct Light Processing technology (DLP)

1. Basic Indicative Diagram

Digital Light Processing (DLP) Printer Technology: Qty – 01

TECHNICAL SPECIFICATION OF 3D PRINTER	
Principle	DLP (Digital Light Processing)
Build Volume	140 x 80 x 180 mm
Printing Speed	10-30mm/h
Screen	3.5-inch colorful IPS touch screen
Net Weight	20 – 30 kg
Printer Dimension	350 x 300 x 550 mm
Power	230VAC, 50 Hz,
Software	Flash DLPrint or equivalent
Connectivity Source Support material Type of processor Vat type Build plate Print accuracy Operating System	USB / Ethernet / Wi-Fi /thumb drive Full HD 2K light engine FH1100, FH1200, FH1400 & Detax Luxaprint 3D shell and Market Standard Material Advanced dual-core 800mhz ARM processor for ultra-fast per formance or Updated Expanded resin vat with convenient disassembly and installation Calibration-free build plate with quick replacement 45 microns Win XP/Vista/7/8/10、Mac OS、Linux etc.

Positioning Accuracy	1920×1080 pixel or more
Support Formats	Input: 3MF/STL/OBJ/FPP/FDP/SLC Output: SVGX
Print Accuracy	±0.05mm

Printer must be with high-resolution DLP optical module, with minimum life span of up to 50,000 hours and should be low heat generation and low maintenance costs.

The image processing technology combined with multiple algorithms, including light intensity uniformity control, distortion correction and gray compensation, makes the light stability stronger and the uniformity higher.

65.Scanner for Reverse Engineering-

1. Basic Indicative Diagram

Scanner for Reverse Engineering

TECHNICAL SPECIFICATION OF 3D SCANNER		
Scan mode: Scan mode should be consist of both modes.		
Scan mode	1.Blue light (with 7-line blue light laser)	2. NIR (structured infrared light)
Accuracy	up to 0.02 mm at a distance of 100 mm	up to 0.1 mm
3D resolution	0.02-2mm	0.1-2mm
Scan speed	up to 60 fps	up to 20 fps
Min. scan volume	5x5x5mm or better	150x150x150mm
Working distance	≥ 150-400mm	170-1000mm
Colour Mapping	Yes	
Alignment modes	marker	Marker, geometry, texture
3D imaging camera resolution	1920×1200 or better	
Additional coloured light	12 white LEDs	
Improved marker detection	12 infrared LEDs	
Laser safety	class 1	
Inertial Measuring Unit(IMU)	Yes	
Input voltage	12V, 2A	
Interface	Type C, USB 3.0	
Operating system	Windows 10/11 (64 bit), macOS	
Overall size	210 x 50 x70 mm or better	
weight	350 gms.	

Scope of Supply:

1. Suitable Sturdy, adjustable Tripod for Scanner
2. High precision glass board
3. Reflective marker points
4. Scanning Pad
5. Portable Case for Scanner
6. USB-C / USB-A Cable 3.0
7. Other standard accessories required for scanner

66. Software for Reverse Engineering- (Integrated with CAD)

a. The scan data should be processed,
b. automatic alignment, auto-region, segmenting,
c. Making sketches from the meshdata, prepare parametric 3D model from mesh data using Solid Modeling & surfacing techniques.
d. The software should integrate directly with single window integration to integratethe model generated by reverse engineering software to the 3D CAD software.
e. Create parametric model from. STL scan files
f. Type : Online/Cloud-based
g. Operating system : For Windows Windows 10 (64bit)
h. Free Required Ram : 8 GB
i. Provide installation Service : Yes
j. License duration : 1Year

67.Working Bench 2.5 m x 1.20 m x 0.75 m

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 164 Pg. No. 192

1. Basic Indicative Diagram

2. The overall size of the Work Bench shall be 2500mm (W) x 1200mm (D) X 750mm(H)

3. It is designed such that it looks minimal yet takes care of every little detail. The understructure of this system comprises of leg assemblies and cross connectors. Overthis matrix of legs and cross connectors, the work surfaces are fixed

4. Components: Main Leg Assembly: The main legs used in the entire system are fabricated by CO2 welded MS Tube of section 50 mm x 50 mm x 5 mm thick (as per IS: 7138 ERW). This shall be powder coated with average 50 to 60 micron Thickness of epoxy powder coating, as per approved shade.

5. This shall be connected to the crossmembers & to the work surface cross Connector These are the supporting members which span across the leg assemblies and form the understructure of workstation. These shall be fabricated by CO2 welded MS tube of section 50 mm x 50 mm x 5 mm thick (as per IS: 7138ERW)

6. Work surfaces: Worktop 25 mm Thick laminated with PVC edge band.Work top shall be made of 25mm thick & 1 mm thick Formica laminated Ply woodTop grade (As per IS: 12823). Bottom shall have a backing Laminate of minimum 0.6mm thickness. All the edges of work surface shall be provided with machine pressed 2 mm thick PVC Edge band glued with hot melt EVA glue. Underside of the work surface shall be screwed to cross connector sand leg assembly.

7. Finish: Epoxy Polyester Powder to the thickness of minimum 50 – 60 microns (+/-10).

8. Process: The body including understructure, framework, legs, storage pedestal including fittings involves an 8 step powder coating process consisting of antirust surface treatment viz. Hot water rinse, Knock of degreasing, degreasing, cold water rinse, phosphating, cold water rinse, passivation, dry off oven treatment and finished with powder coating using epoxy polyester powder of 50 – 60 microns (+/-10). The material is then oven baked with a controlled temperature of 180 deg.C to 200 deg.C.

9. Tests: The powder coating treatment shall strictly comply with IS: 13871 (1993) inclusive of method of tests i.e. Dry film/ coating thickness, Finish, Gloss 60°, Colour retention, Scratch hardness, Impact resistance test, Conical Mandrel test, Erichsen cupping test, Pencil hardness, DFT measurement, Salt spray test, Adhesion Cross cut test, Rub test with MEK, Protection against humidity, Resistance to boiling water, lubricating oil, petrol, heat double bake, bleeding, Detergents, acid/ alkali. The test reports shall be submitted along with the tender. The finishing processes given are generalized. Need to consider wherever it isapplicable as per the Specs. Of the product.

10. Colour: Table Worktop Color- Highline Pine/White Cedar/Frosty White. Metal Understructure- Prince Grey/ Bond White. Final colour combination will be decided by DVET.

11. Manufacturing Process: The complete unit shall be as per manufacturer's specifications and Flowchart of manufacturing process shall be submitted along with the tender.

12. Raw materials (Wood working): 1) Plain Plywood Board (PPB), 2) Decorative Laminate 1 mm Formica (DL), and 3) Lipping (PVC lipping).

13. Process (Wood working): Plywood board from approved supplier Wood Cutting(cutting from mother board 600mm x 2400mm sheet to the desired size on Panel saw machine with no sharp edges, no glue marks, no scratches, no machine marks and no cracks at drill hole) Lamination (Hot lamination adhering Decorative laminate to Plywood board using approved make adhesive) Sizing/ Routing (fine sizing and setting curvilinear shapes) Lipping/ Edgebanding (adhering PVC lipping on MDF board using hot melt glue under heatand pressure) Finishing Assembly and Packaging (carcase/ panel assembly, final inspection/ correction if required, packing and dispatch).

14. Raw materials (Metal working): 1) Mild steel and 2) Epoxy polyesterpowder (for powder coating).

15. Process (Metal working): Assembly/ Sub-Assembly (for welded all components get assembled and for knock down sub-assemblytakes place. CO2 welding and spot welding is done) Pre-treatment (8 step process including anti-rust surface treatment) Powder coating (surface coating applied in the form of powder and on curing produces a protective coating, examination of test coating specimen for blisters, flaking and corrosion) Assembly and Packaging (carcase/ panel assembly, final inspection/ correction if required, packing and dispatch).

16. The manufacturing processes given are generalized. Need to considerwherever it is applicable as per the Specifications of the product.

17. All raw materials for manufacturing process shall be as per relevant IS code.142.9

18. Size and Weight:

    a. Overall Length: 2500 mm

    b. Overall Depth: 1200 mm

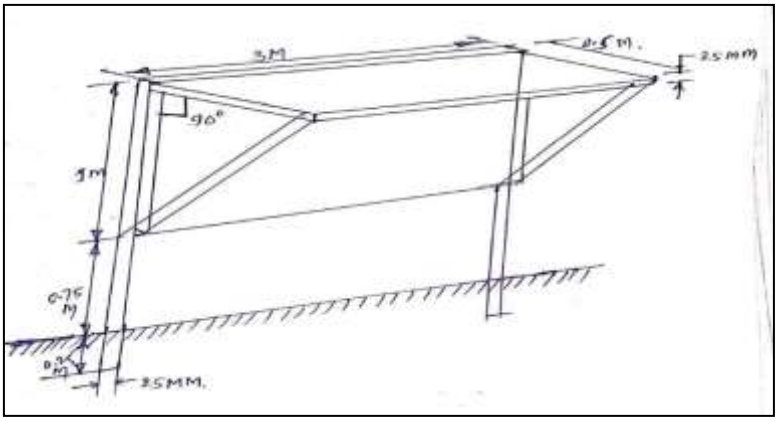
    c. Overall Height: 750 mm

    d. Net Weight: Minimum 40 Kg

68. Wiring Board 3 meters x1 meter with0.5 meter projection on the top

As Per DVET, Maharashtra State, SPECIFICATION FOR Wireman Item No.26 Pg. No. 183

1. Basic indicative diagram**:**



2. Length- 3 mtr , Width- 1 mtr
3. Ceiling length & width – 3mtr x 0.5 mtr, Thickness- 35mm
4. Height of stand 0.75 mtr ,
5. Material – pine wood of Thickness- 35mm
6. Frame structure – 2mtr x 3mtr MS square pipe 50 mmx1.6mm thick fabricated.

69. Metal Rack 100cm x 150cm x 45cm

As Per DVET, Maharashtra State, SPECIFICATION FOR Electrician Item No 168 Pg. No. 196

1. Basic Indicative Diagram

70. Size -100cm x 150cm x 45cm
71. Type -Angle Frame
72. Material -Mild Steel Slotted Angle Percolated CRC Sheet
73. Surface Finish Powder Coated
74. Load Capacity per layer (Kg) 100-150 Kg
75. Fitting Adjustable with nut bolt