

**THE NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL
EDUCATION AND TRAINING**



***MANUALS FOR ESTABLISHING A VET CENTRE
FOR
MECHANICAL SECTOR***

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APPENDIX 1: LIST OF TOOLS AND EQUIPMENT

LIST OF ABBREVIATIONS

CBET	-	Competence Based Education and Training
FTC	-	Full Technician Certificate
TT	-	Trade Test
VET	-	Vocational Education and Training
NACTVET	-	National Council for Technical and Vocational Education and Training
VTC	-	Vocational Training Centre
VTTC	-	Vocational Teachers Training College

PREAMBLE

Vocational Education and Training in Tanzania is governed by the National Council for Technical and Vocational Education and Training, established under the National Council for Technical and Vocational Education and Training Act, Cap. 129. This act empowers NACTVET to oversee and coordinate the provision of technical and vocational education in non-university institutions across the country. This manual therefore, gives guiding parameters so as to meet the minimum required standards set by the NACTVET Governing Council having in mind that one of its major roles is to ensure that vocational education and training provision satisfies the demands of the labour market with employees who have the required knowledge, skills and attitudes in order to improve production and productivity of our economy. When preparing the manual the following key areas were considered as essential for establishing Vocational Training Centres.

- A clearly defined organisation structure showing all the key positions for the efficient and effective operation of the Centre.
- NACTVET has set the standard required qualifications and competences which must be met by Vocational Teachers. The vocational teachers will be licensed and categorised by NACTVET according to their qualifications and experiences.
- This manual also provides criteria for a standard Vocational Training Centre (VTC) which will allow them to be registered and categorised accordingly. If the standards are not met, then the VTC will not be registered and Training Programmes will not be allowed.
- For the purpose of proper financial control of Centre funds, each VTC must keep proper records of all financial transactions showing the incomes and expenditures of the centre.
- Standard floor area requirements for workshops, classrooms, hostels, dining hall, offices, stores, library, toilets, playing fields etc, must be maintained. External and internal environment must also be conducive for training.
- Basic machines, equipment, tools and furniture must be provided to workshops and classrooms. Inventories must be well kept and updated. The items mentioned above must appear by proper name and specification in the inventory. Architectural drawings for all buildings, drawings for electrical wiring and drainage systems must be well kept by the Principal of the Centre.

NACTVET being vested with the role of overseeing and regulating the provision of Vocational Education and Training of other Providers will strictly observe these guidelines during the process of registration and categorisation of Vocational Training Centres.

Finally, it is believed that a VTC operating under these guidelines will produce the right outputs for the labour market, thereby increasing the productivity of our economy. It is also hoped that this manual will not remain static but is subject to updating when the conditions require so.

PART ONE

1. INTRODUCTION

The kind of VET system that is needed to spearhead socio-economic development in Tanzania will demonstrate itself in the kind of VTCs it will establish. There will be a close relationship between quality VTCs and products (trainees and services) it will produce. Countries with properly established VET centres are invariably placed to produce quality products.

This manual is intended to provide necessary information regarding requirements for the establishment of VTCs. In this manual quality parameters are defined. This will help to maintain consistency in training delivery.

Quality parameters are defined basing on three major areas which seek to address implementation of the Competence Based Education and Training (CBET) concept. These key areas are quality and sufficiency of tools and equipment, governance of the centre and infrastructure.

Vocational education and training is offered in 12 sectors which cover National vocational Award 1-3. The sectors include Civil and Building Engineering, Commercial and Business Support, Hospitality and Tourism, Automotive, Agriculture and Food Processing, Mining, Clothing and Textile Technology, Cosmetology, Transport, Mechanical and Printing. However, this manual focuses on the Agriculture and Food Processing occupations.

To ensure that each registered centre offers training according to its capacity. Registration of VET centres will be done according to the following categories:

1.1. Categorization of VTCs.

A Centre will be registered under any of the categories listed in Table R1.

Table R1: Criteria for Categorization of VTCs

CATEGORIZATION	CRITERIA	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
1. Occupation.	1.1. Number of occupations.	Minimum eight (8) occupations for multi-sectoral Centres or four (4) for sector specific Centres.	Minimum five (5) occupations for multi-sectoral Centres or two (2) for sector specific Centres.	Minimum one (1) occupation.	Minimum one (1) occupation.
	1.2. Qualifications levels.	Minimum of four (4) occupations offered above level II.	Minimum of two (2) occupations offered above level II.	Minimum of one (1) occupation offered up to level II.	Minimum of one (1) occupation up to level I.
2. Staff Qualifications 2.1 Principal	2.1.1 Academic qualifications	Minimum Form VI or equivalent.	Minimum Form VI or equivalent.	Minimum Form VI or equivalent.	Minimum Form IV or equivalent.
	2.1.2 Professional qualifications.	1 st Degree in technical/vocational education or equivalent for VTCs with training up to level IV and Master above level IV.	1 st Degree in technical/vocational education or equivalent for VTCs with training up to level IV and Master above level IV.	1 st Degree in technical/vocational education or equivalent for VTCs with training up to level IV and Master above level IV.	Certificate in technical education or equivalent
	2.1.3 Work Experience in relevant field.	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	Minimum five (5) years.
2.2 Vocational teacher	2.2.1 Academic qualifications.	Minimum Form IV.	Minimum Form IV.	Minimum Form IV.	NA
	2.2.2 Professional qualifications.	Minimum one level above the level taught in a relevant occupation or field. TEACHER MINIMUM LEVEL III.	Minimum one level above the level taught in a relevant occupation or field. TEACHER MINIMUM LEVEL III.	Minimum one level above the level taught in a relevant occupation or field. TEACHER MINIMUM LEVEL III.	National vocational certificate of competence or equivalent
	2.2.3 Teaching qualifications.	Minimum Teacher Certificate in education.	Minimum Teacher Certificate in education.	Minimum Teacher Certificate in education.	Minimum Instructional Methods Certificate (IMC).
	2.2.4 Work Experience in relevant field.	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	Minimum five (5) years in relevant field.
2.3 Training Coordinator/ Registrar	2.3.1 Academic qualifications.	Minimum Form IV.	Minimum Form IV.	Minimum Form IV.	NA
	2.3.2 Professional qualifications.	Minimum Ordinary Diploma in technical field or equivalent for VTCs with training up to level IV and 1 st Degree above level IV.	Minimum Ordinary Diploma in technical field or equivalent for VTCs with training up to level IV and 1 st Degree above level IV.	Minimum Ordinary Diploma in technical field or equivalent for VTCs with training up to level IV and 1 st Degree above level IV.	NA
	2.3.3 Work Experience in training	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	NA
2.4 Accountant	2.4.1. Academic qualifications.	Minimum Form VI.	Minimum Form IV.	Minimum Form IV.	NA
	2.4.2. Professional qualifications	Minimum Diploma or equivalent in relevant field	Minimum Diploma or equivalent in relevant field	Certificate equivalent in relevant field	NA
	2.4.3. Work Experience in relevant field	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	NA

CATEGORIZATION	CRITERIA	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
3 Centre Capacity.	3.1 Teacher trainee's ratio per class.	1:20	1:20	1:20	1:5
	3.2 Infrastructure.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	Enough for five (5) trainees as per programme requirements
	3.3 Tools and equipment.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	Enough for five (5) trainees as per programme requirements

We hope that the guidelines will be useful not only to those who would like to establish a VTC for specific occupations but also to providers who wish to improve their existing VTCs for the purpose of registration.

The manual is divided into five main parts, namely: centre governance, staffing, centre financial management, infrastructure, tools and equipment.

PART TWO

2. VOCATIONAL TRAINING CENTRE GOVERNANCE

Good governance is an important aspect in establishing a VET centre. It ensures accountability, participation, transparency, equity and rule of law in operation of the VET centre. This will also play part in making the centre sustainable. Involvement of stakeholders in governing the centre is imperative. It is therefore mandatory for a VET centre with categories A - C to have an Advisory Board/Board of Trustees.

The composition of the Board will have the following representation:

- i. Centre owner;
- ii. Parents;
- iii. Employers;
- iv. Government at District /division level;
- v. Centre employees; and
- vi. Principal-Secretary to the Board.

PART THREE

3. STAFFING

Staffing of a Centre will consist of the following personnel:

(a) Principal

The Principal is the Chief Executive of the centre. He/she will develop strategies and policy matters that included soliciting donor fund, centre and VET promotion, sensitize stakeholders with view to meet the centre goals and plan. For the centre with categories A-C, he/she will be the secretary to the Centre Advisory Board/Centre Board of Trustees.

Under these categories the Principal will be assisted by the following titles- Training Coordinator, Centre Administrator, Accountant, Entrepreneurship and Short course coordinator.

Minimum Qualifications of a Centre Principal:

For category A, B and C VET centres

- i. Degree in Technical / Vocational Education or equivalent.
- ii. Three (3) years work experience in the relevant field.

For category D VET centres

- i. Certificate in Technical / Vocational Education or equivalent.
- ii. Five (5) years work experience in the relevant field.

(b) Training Coordinator

The functions of a training coordinator in a VTC will be those activities related to training which include trainees' enrolment, coordination of trainees' assessment, monitoring training, discipline, guidance and counselling, Trainees' welfare in general and preserving centre

environment. The coordinator will be supported by Head of departments, warden/matron and head cook.

Minimum Qualifications of a Training Coordinator

- i. Ordinary Diploma or equivalent in any technical education field;
- ii. Certificate in teaching;
- iii. Three (3) years experience in training.

(c) Human Resource Officer

The Human Resource Officer will provide support for day to day administrative activities which include; staff welfare, staff development, security matters and stores.

Minimum Qualifications of a Human Resource Officer

- i. Certificate in Human Resources Management;
- ii. Three (3) years experience in relevant field.

(d) Accountant

The Accountant will keep all financial and accounts records of the centre.

Minimum Qualifications of the Accountant

- i. Diploma in accountancy;
- ii. Three (3) years experience in relevant field.

(e) Secretary

The secretary will be a personal assistant to the Principal and will perform all duties related to secretarial responsibilities.

Minimum Qualifications of the Secretary

- i. Form IV education;
- ii. Stage III certificate.

(f) Teaching staff

Vocational teachers have the central role of making the training relevant. Vocational teachers are the first-line practitioners of vocational training. A befitting vocational teacher to carryout vocational training within the Tanzanian VET system will have the following attributes:

- i. Critically alert;
- ii. Imaginative, innovative, proactive, creative;
- iii. A cultivated person with the courage and ability to face and solve problems;
- iv. Active in the pursuit of truth and goodness within the overall accepted aspirations of a nation at large; and
- v. Willingness to learn.

To ensure efficiency and effectiveness in training delivery, the maximum vocational teacher – trainee’s ratio will be 1:20.

Minimum Qualifications of a Vocational Teacher

Vocational teachers shall be licensed and categorised according to their qualifications and the level (s) in which they are allowed to teach. The required qualifications for vocational teachers are as described hereunder:

Vocational teachers for level I-III shall have the following qualifications:

- i. Holders of FTC, Diploma or other equivalent qualifications in the relevant field;
- ii. Teaching certificate obtained from VTTC or any other recognised institution; and
- iii. At least three (3) years of post training relevant practical work experience in his/her field of specialisation.

Vocational teachers for level I-II shall have the following qualifications:-

- i. Form IV secondary certificate;
- ii. Vocational Certificate of Competence or equivalent;
- iii. Teaching certificate obtained from VTTC or any other recognised institution; and
- iv. At least five (5) years of post training relevant work experience in his/her field of specialization.

Competences of a vocational teacher

A Vocational Teacher must possess the following competences:

- i. Able to interpret occupational training standards into learning process;
- ii. Evaluate training process and outcomes;
- iii. Compare training offered and the demand from the labour market;
- iv. Prepare report on training implementation in his/ her own workshop;
- v. Prepare maintenance schedule for training tools and equipment;
- vi. Counsel and guide trainees in the workshop; and
- vii. Ability to maintain a conducive environment for learning.

NB : Permanent teachers should be two thirds ($\frac{2}{3}$) of all teachers in the centre.

PART FOUR

4. CENTRE FINANCIAL MANAGEMENT

Proper management of centre finances is very important. It is therefore advised for anyone who aspires to establish a VET centre at categories A-C has to ensure that proper systems for managing finances are in place. These will ensure stability and sustainability of a VTC in a long run.

The following are important pre requisites:

- a) Bank account;
- b) Qualified staff;
- c) Reliable sources of funds; and
- d) Management of Cash Flow

PART FIVE

5. INFRASTRUCTURE

Infrastructure of a VTC with categories A-C include, among other things, workshops, classrooms, trainees hostel, conference hall, storage facilities, staff houses, and external environment. All building infrastructure should be able to accommodate people with special needs.

For the VTC with category D should have proper premises to facilitate practical and theoretical training. It should have some storage facilities and provision facilities for hygiene.

In deriving the size of the area suitable for training, the following factors have been taken into account:

- i. The number of trainees in one workshop;
- ii. Type of equipment;
- iii. Air circulation in a room; and
- iv. Movement of users within a room and around the building for various activities.

The provided schematic drawings demonstrate how a workshop or a training space should look like. It is not obligatory to use the same design but one should adhere to specifications provided in the Table 1. Users are strongly advised to seek for technical expertise from professionals who will help them translate information contained in this work into proper architectural and engineering drawings required for erection of buildings.

In this respect, construction of centres should consider standards as elaborated in the Table 1.

TABLE 1: INFRASTRUCTURE SPECIFICATIONS

S/N	ITEM/DESCRIPTION	NORM/SPECIFICATIONS
1.	Vocational teacher– Trainee Ratio.	1:16 -20 (Capacity for a single class/workshop is between 16 to 20 trainees).
2.	Area per trainee. <ul style="list-style-type: none"> Workshops (without offices). Classrooms (without offices). Conference Hall (without offices). Dining Hall (without kitchen). Library. Kitchen facility. 	<ul style="list-style-type: none"> 5 -14sqm per Trainee (workshop with light equipment like tailoring, computer applications – 5sqm/trainee; those with large equipment e.g. machinery fitter, etc. 12 – 14sqm/trainee can be used). 2.5 – 3 sq m per trainee. 1.5 – 2.5 sq m per trainee. 1.5 – 2.5 sq m per trainee. 2.5 – 3.5 sq m per trainee. 0.2 – 0.3 sq m per trainee.
3.	Areas for other general facilities. <ul style="list-style-type: none"> Administration Block. Office (for a teacher, officer etc). Office for Head of section/department 	<ul style="list-style-type: none"> 200 – 250 sq m. 10 – 16 sq m. 16 – 25 sq m.
4.	Toilets and change rooms. <ul style="list-style-type: none"> Number of persons per toilet Unit. Minimum unit area. Change rooms. 	<ul style="list-style-type: none"> 4 - 5 persons per toilet unit (staff). 8 -10 trainees per toilet unit (trainees). 1.5 – 2 sq m. 1 – 1.5 sq m per trainee (it is advised that each workshop should have a change room, which must be gender sensitive. Provision of washing basin and showers in a change room will depend on the type of occupation).
5.	Storage facilities. <ul style="list-style-type: none"> General store. Office store. Workshop store. 	<ul style="list-style-type: none"> 12 - 30 sq m. 2 – 6 sq m. 10 – 30 sq m (the shape of which has to depend on the type and nature of materials to be stored).
6.	Trainees Hostel. <ul style="list-style-type: none"> 4 trainees per room. 	<ul style="list-style-type: none"> 16-24 sq m per room with height 3.0m Provide study room for at least 20 trainees.
7.	Staff house.	100 – 200 sq m per single family house.

S/N	ITEM/DESCRIPTION	NORM/SPECIFICATIONS
8.	Location.	Suitable location of the training facilities required; workshop with heavy duty equipment preferably to be located on the ground floor. Location should consider other surrounding activities.
9.	Floors.	Strong floors capable of withstanding operations of a particular occupation
10.	Structure condition.	The structure and materials to be used should be durable, sound, safe, strong, Impurities free, attractive and available at local market.
11.	Internal environment.	<ul style="list-style-type: none"> • Should be smoke/dust free; well ventilated/air conditioned; enough natural and artificial lighting; appropriate colours in walls and ceiling necessary furniture and fixtures should be available. • Height of head room to be not less than 3m and above • Room relationship to be considered to minimize unnecessary movement. • Type of floor finish to match with the nature of activity performed.
12.	External environment	Provide access roads landscaping, walkways to allow movement people with disability.
13.	Utilities.	Proper electrical installation and power supply ² ; enough water supply; adequate sewerage disposal system; adequate solid waste disposal system; well functioning telecommunication facilities; fire fighting/prevention facilities as per regulations; dust/smoke removing mechanism for dust/smoke generating workshops.
14.	First – Aid facilities and safety gears.	Standard first-aid box with basic medication installed in a conspicuous position; safety gears must be available for both vocational teacher and trainees.
15.	Legality of VET Centre in guidelines and Council Regulations. <ul style="list-style-type: none"> • Birds class layer type • Broiler birds 	NACTVET plays a role of establishing and monitoring guideline to VET provider and not authorizing permission to commence construction activities. The respective regulatory Body is obliged to administer their regulations. <ul style="list-style-type: none"> • Brooding space 20-30 birds/m² • Growing space 10-20 birds/ m² • Layer’s birds 5-6 birds/ m² • Brooding space 20-30/ m² • Growing space 10-12 birds/ m²
16.	Space for seedling production (horticulture)	<ul style="list-style-type: none"> • Extra 1-5 Acres required for horticulture practical • Provide reliable source of water for irrigation purposes. • Head room height not less than 3.6 m high.
17.	Chick space:	38cm ² per layer chick, 52cm ² per broiler chick
18.	Size of foundation	The depth of the foundation to be determined at/in site, also nature of soil water table and the load to be imposed. But also the materials to be used
19.	Safety awareness	Adherence to occupational health and safety should be taken on board to enhance high productivity and keep good working

S/N	ITEM/DESCRIPTION	NORM/SPECIFICATIONS
		environment
20.	Others.	Master timetable placed at conspicuous area; at least one wall clock in each workshop; at least one suggestion box for each VTC. Each VTC has to have indoor or outdoor sports areas.

PART SIX

6. BASIC TOOLS AND EQUIPMENT

The minimum requirements of tools and equipment for a VTC with categories A-C for each occupation are provided. The same specifications of tools and equipment can be used for category D, but quantity and type will depend on curriculum contents to be covered.

The purpose of this list is to provide guidance and help management and authorities of vocational institutions to plan their equipment requirements with accuracy and produce precisely defined technical specifications.

It is advisable when purchasing tools and equipment to consider their durability, serviceability, accuracy, versatility and low operating costs.

APPENDIX 1
LIST OF TOOLS AND EQUIPMENT

**BASIC TOOLS AND EQUIPEMENT FOR BOILER MECHANICS AND PIPE FITTING
(FOR 16 TRAINEES)**

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Oxy-Acetylene Gas Plant	- Oxygen cylinder 172Bar. - Acetylene Cylinder 15Bar - Cut and Weld equipment	Set	1:8	√	√	√
2.	Drilling machine with accessories	Pillar - Max. Quill movement 115mm. - Drilling capacity Ø10.0-31mm.	Each	1:16	√	√	√
3.	Bench drilling machine with accessories	- Spindle capacity 3m - Max. Quill movement 125mm. - Drilling capacity Ø16-32mm.	Each	1:8	√	√	√
4.	Portable drilling machine	- Rotary percussion - Variable speed - Max. drill size range Ø(0-13)mm. - Power source 220V/50 Hz - 750W	Each	1:8	√	√	√
5.	Arc welding machine (DC/AC)	- Power Source: 380V, 50Hz. - Phase 3 - 60% duty cycle.	Each	1:16	√	√	
6.	Boiler medium size complete	- Discharge 1 tone/hr		1:16	√	√	√
7.	Turbine generator	- Power source 380V, 10 kVA.	Each	1:16		√	√
8.	Steam trap	Capacity- compatible to the system 10Bar	Each	1:4	√	√	√
9.	Oxy-acetylene Gas plant	Oxygen cylinder 172Bar. Acetylene Cylinder 15 Bar Cut and weld equipment	Set	1:8	√	√	√
10.	Bench shearing machine	(0-1.5)mm thick of mild steel plate	Each	1:16	√	√	√
11.	Calibrating machine	0-30Bars	Each	1:16	√	√	√
12.	Pipe templates	For pipe bending Machine	Set	1:4	√	√	
13.	Pedestal grinder	- Power source 380V, 30A AC 50Hz - Grinding wheel size Ø200x20 x52mm.		1:8	√	√	√
14.	Hydraulic bending Machine with accessories	Max. Capable of bending to 6mm m.s plate length of 2500mm or 8 feet	Each	1:16	√	√	
15.	Power saw machine with accessories	Blade size 450x30x3mm.	Each	1:16	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
16.	Soldering gun	- Electric bent and straight bits - Electric power 240V/750W.	Each	1:4	√		
17.	Hydraulic Pipe Bender manual with its Formers	- Ø(3/8" -3/4") - Ø(1/2"-3")	Each	1:8	√	√	
18.	Blow lamp	Capacity 0.5lts	Each	1:4	√		
19.	Drier	- Power Source 240V, 1.5A, 750W	Each	1:16		√	√
20.	Computer set	- UPS, Monitor, Key board - Mouse, Printer	Each	1:14	√	√	√
21.	Conveyors	- Steel Conveyor belt - Rubber conveyor belt	Each	1:4	√	√	√
22.	Fork - Lift	Capacity 10 tons.	Each	1:16		√	√
23.	Crane	Capacity 5 tons	Each	1:16		√	√
24.	Tool trolley	With four wheels	Each	1:4	√	√	√
25.	Pipe clamps	Universal - Medium size 1", 1 1/4", 1 1/2"	Each	1:4	√	√	
26.	Fume extractor	Complete unit Ø150mmx3m.	Each	1:16	√	√	√
27.	Manometer	Range 0-250Bar	Each	1:4			√
28.	PH Meter	Adjustable: Medium size kit	Kit	1:16		√	√
29.	Pressure gauge Tester	Bucket (0-20) Bar	Each	1:8		√	√
30.	Electrical Pipe Threading Machine	- Ø1 1/2"-2 1/2", - Ø1/8"-1 1/2", - Ø3"-4"	Each	1:8		√	√
31.	TDS meter	Total dissolved solids - Industrial type.	Each	1:4		√	√
32.	Thermometer	- Industrial Temperature meter 0 – 500° C - Surface type - Immerse type	Each	1:4	√	√	√
33.	Avometer	With voltage, current and resistance measuring.	Each	1:1	√	√	√
34.	Hydrometer	Industrial Tester	Each	1:4		√	√
35.	Oxygen analyser	Industrial tester	Each	1:4		√	√
36.	Flue gas tester	Industrial	Each	1:4		√	√
37.	Boiler Operation Manual	Industrial	Each	1:1		√	√
38.	Vacuum cleaner	Industrial	Each	1:16		√	√
39.	Wheel barrow	Capacity to carry 100kg.	Each	1:4		√	√
40.	Gas/steam leak detector	Industrial	Each	1:1	√	√	√
41.	Valves for training	- Globe valve Ø3" - Gate valve Ø3" - Non-return valve Ø3"	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
42.	Angle grinder	- Speed 3200r.p.m. - Diameter of cutting disc 9" - Power source 240V, AC 50Hz	Each	1:8	√	√	√
43.	Steel Cabinets	Dimensions: Length: 1000mm. Height: 1500mm. Width: 310mm.	Each	1:1	√	√	√
44.	Classroom table	Dimensions: Length: 1200 mm. Height: 800mm. Width: 720Wmm.	Each	1:2	√	√	√
45.	Anvil	Weight 50 kg	Each	1:8	√	√	√
46.	Classroom chairs	Dimensions: Length: 400mm. Height: 450 mm. Width: 420mm.	Each	1:1	√	√	√
47.	Rotary Pump	- Gear type Ø1½" - Screw type Ø1½" - Slide vane type Ø1½" - Lobe type Ø1½"	Each	1:4	√	√	√
48.	Reciprocating Pump	- Piston type Ø1½" - Plunger type Ø1½"	Each	1:4	√	√	

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Spanners	Combination: Forged type - 6-32mm A/F.	Set	1:4	√	√	√
		Adjustable: 8", 12", 18" Length	Set	1:8	√	√	√
		Ring: 6-32mm, 33-56mm.	Set	1:1	√	√	√
		Open End - 6-32mm, (33-56)mm AF.	Set	1:1	√	√	√
2.	Screw drivers flat	3.5 – 8mm.	Set	1:4	√	√	√
3.	Tube expander	Variable: Ø(1/2"-2 1/2")	Set	1:2	√	√	√
4.	Hammers	Chipping: Weight 300g.	Each	1:8	√	√	√
		Mallet - Copper, Plastic - Rubber, Aluminium	Each	1:4	√	√	√
		Ball pein - Weight: 110g. - Weight: 250g. - Weight: 450g - Weight: 500g	Each	1:1	√	√	√
		Copper: Weight 1Kg	Each	1:2	√	√	√
		Straight pein: Weight 1kg	Each	1:2	√	√	√
5.	Gaskets	Steam: 2mm thick	Sheet	1:4		√	√
		Rubber: 2mm thick	Sheet	1:4		√	√
		Paper: 1mm thick	Sheet	1:4		√	√
6.	Pliers	Assorted Circlip - 220mm length	Set	1:4	√	√	√
		Grip: 250mm length	Set	1:4	√	√	√
		Combination: 200mm length End cutter, Side cutter	Each	1:2	√	√	√
7.	Hack saw frames	Adjustable: 300mm length.	Each	1:4	√	√	√
8.	Tube expander	Ø(1/2"-2 1/2")	Set	1:2	√	√	√
9.	Pipe templates	For pipe bending Machine	Set	1:4	√	√	
10.	Pipe reamer	Ø(6-50)mm.	Set	1:8	√	√	
11.	Tap and valve reseating tools	- Supplied in wooden box. - No. of cutter 19. - Sizes 16mm, 20mm, 25mm, 30mm, 35mm, 46mm plain flat.	Set	1:16	√	√	
12.	Pipe wrenches	Small, medium, big - 3 1/4" - 3 1/2" opening - 1/2" - 4", 1 1/2 - 6", opening 2 1/2 - 8" opening	Each	1:8	√	√	√
13.	Vices	Pipe - Maxi. pipe Ø3-6", 1/8"-1 1/2"	Each	1:8	√	√	√
		Bench: 100mm jaw width. - 150mm jaw width	Each	1:8	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Machine Swivel base - 100 jaw width	Each	1:8	√	√	√
14.	File set	Assorted: 250mm length.	Set	1:4	√	√	√
15.	Measuring tape	Range (3-5)m.	Each	1:4	√	√	√
16.	Valves	Medium size for training	Each	1:4	√	√	√
17.	Wire brush	- 30mm circular section - 290mm steady brush.	Each	1:2	√	√	√
18.	Scrappers	Assorted Medium size 3x20x300mm	Each	1: 1	√	√	√
19.	Pipe cutter with accessories	For pipe Ø(2½-4")and Ø(⅛-1½").	Set	1:4	√	√	
20.	Tube cleaner (For Boilers)	Ø½", ¾", 1", 1¼", 1½" 2"	Each	1:4		√	√
21.	Spade shovel	Standard	Each	1:8	√		
22.	Pickaxe	- Hardened and tempered wooden handle. - 700mm Length. - 4kg Weight	Each	1:8	√	√	√
23.	Soldering gun	- 26mm, 500g. - 30mm, 500g.	Each	1:8	√	√	√
24.	Measuring Tools (Liner)	Steel rule (0-300) mm, (0-600), (0-100) mm long.	Each	1:1	√	√	√
		Vernier Callipers' 0-150mm.	Each	1:1	√	√	√
		Micrometer Screw Gauge - Digital/screw type. - 0-25mm, 25-50mm. - 50-75mm, 75-100mm. - 100-200mm.	Each	1:4	√	√	√
		Vernier Height: 0-200mm.	Each	1:4	√	√	√
25.	Tin man's snip	Straight, left, right hand	Set	1:8	√	√	√
26.	Drier for boiler	Power source: 220V, 1.5A, 750W.	Each	1:16	√	√	√
27.	Maintenance Manuals	For: Boiler, Pumps, Burners	Each	1:16	√	√	√
28.	Turbine log Book	Industrial 10kVA	Each	1:16	√	√	√
29.	Maintenance Manual	- Air Turbine - Water Turbine - Steam Turbine	Each	1:4	√	√	√
30.	Pullers	Two legged: 250mm.Length	Each	1:4	√	√	√
		Three legged: 250mm.Length	Each	1:4	√	√	√
31.	Spirit level	Engineering - Straight 450mm.Length - Angled 350mm.Length	Each	1:1	√	√	√
32.	Ladder adjustable	Electrician - Aluminium 3m long	Set	1:8	√	√	√
33.	Drawing instruments	- Standard	Set	1:1	√		
34.	Gauges	Pressure - Range 0-250 bar	Each	1:4		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- Hose connection ¼"					
		Marking (adjustable) - 0-200mm.	Each	1:8	√	√	√
		-					
35.	Twist Drill	Taper shank: Ø13-32mm.	Each	1:4	√	√	√
		Set with range of 0.5mm - Ø1-13mm.	Each	1:4	√	√	√
36.	Allen key	Key size 1-10mm.	Set	1:4	√	√	√
37.	Inspection lamps	Medium size 75W.	Each	1:8	√	√	√
38.	Flue gas analyzer	Medium size	Kit	1:8		√	√
39.	Measuring cylinders	Medium size	Each	1:4		√	√
40.	Plant pipette	Medium size	Each	1:4		√	√
41.	Burette	Medium size	Each	1:4		√	√
42.	Nozzle Adjustable Kit	Medium size	Kit	1:16		√	√
43.	Safety gears	- Helmets - Type 15 yellow - Size adjustable 53-57	Each	1:1	√	√	√
		- Safety goggles - Lens type clear	Each	1:1	√	√	√
		- Breathing masks	Each	1:1	√	√	√
		- Leather gloves - For right and left hand	Each	1:1	√	√	√
		- Leather apron	Each	1:1	√	√	√
		- Leather tough boots	Each	1:1	√	√	√
		- Ear Muffs	Each	1:1	√	√	√
		- Overall	Each	1:1	√	√	√
44.	Fire extinguisher	CO ₂ , dry powders and sand in the bucket	Each	1:1	√	√	√
45.	Oil Can	With long beak - Capacity 0.25lts or 0.5lts.	Each	1:1	√	√	√
46.	Spade	Curved	Each	1:1	√	√	√
47.	Brooms	Hard: Floor type	Each	1:1	√	√	√
		Soft: Floor type	Each	1:1	√	√	√
48.	Shovel	0.5-1kg.	Each	1:4	√	√	√
49.	Mechanical Tool Box	Industrial, Safety posters assorted	Each Set	1:4 1:16	√ √	√ √	√ √
50.	Spring divider	Height: 300mm.	Each	1:8	√	√	√
51.	Guns	Pop riveting: Ø3-6mm.	Each	1:8	√	√	√
		Spraying: Capacity 0-5 lts	Each	1:16	√	√	√
		Electrical Soldering - Power supply: 220V, 3A, 1500W	Each	1:1	√	√	√
52.	Electrical Extension Cable	Ø ⁰ 5mm 30m long.	Each	1:8	√	√	√
53.	Diagonal Cutting Nippers	0-200mm.	Each	1:8	√	√	√
54.	Flaring tool	- Ø16-18mm, Ø0-16mm. - Ø13-18mm.	Each	1:2	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
55.	Electrical Tool Kit complete	Standard for Electrician	Each	1:4	√	√	√
56.	Electrical Board	Standard for training	Each	1:4	√		
57.	Punches	Centre: Ø12x150mm.	Each	1:1	√	√	√
		Hollow: Ø5-52mm.	Each	1:1	√	√	√
		Double: Ø5-50mm.	Each	1:1	√	√	√
58.	Try squares	- 50mm. Length - 100mm. Length - 150mm. Length - 200mm. Length - 300mm. Length - 600mm. Length	Each	1:4	√	√	√
59.	Scriber with handle	Straight one side and bent another side length 220mm	Each	1:4	√	√	√
60.	Gasket cutter	Ø30-150mm.	Each	1:4	√	√	√
61.	Taps	- M4-M16	Each	1:4	√	√	√
	Dies	- M4-M16					
62.	Tap wrench Die stock	- For tap: M4-M16 - For die: M4-M16	Each	1:4	√	√	√
63.	Workshop stools	- 850mm height	Each	1:1	√	√	√

BASIC TOOLS AND EQUIPMENT FOR FITTER MECHANICS

(FOR 16 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Universal milling machine with accessories. (Optional: CNC Universal Milling M/C of similar size – Level- III)	<ul style="list-style-type: none"> - Size of working table 1000x260mm. - Number of 'T' slots 3 - Longitudinal traverse 659mm. - Cross traverse – 220mm. - Vertical traverse – 460mm. - Swivel of table +-45° - Spindle centre to table min/max 0-416mm. - Number of feeds 12 - Main motor 4 Horse Power (HP) - Quick traverse motor 0.5HP - Coolant unit for motor power 0.1HP 	Each	1:16		√	√
2.	Shaping machine with complete accessories	<ul style="list-style-type: none"> - Maximum stroke 450mm. - Number of stroke 6 - Longitudinal traverse 500mm. - Vertical traverse 305mm. - Table dimension 450x 300x300mm. - Rated motor power 4HP 	Each	1:16	√		
3.	Lathe machine with accessories (Optional CNC Lathe Machine of similar size)	<ul style="list-style-type: none"> - Height of centres 195mm, distance between centres 1000mm. - Max. turning diameter overhead 300mm. - Max. Travel of cross slide 200mm. - Mai. Travel of top slide 120mm. - 2 speed motor 1440/2860 r.p.m - Rated motor power 3.7HP / 4.7kW 	Each	1:4	√	√	√
4.	Tools and cutter grinding machine with accessories	<ul style="list-style-type: none"> - Working surface 920mmx 140mm. - Longitudinal movement 450mm. - Cross movement 225mm. - Swivel of table +-45° - Height of centre 125mm. - Maxi. Swing above table 265mm. 	Set	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		<ul style="list-style-type: none"> - Maxi. distance between centre 620mm - Maxi. distance between centres for circular grinding 500mm. 					
5.	Surface grinding machine with accessories	<ul style="list-style-type: none"> - Safety glass guide - Working surface width 450mm. - Maxi. Traverse travel 180mm. - Maxi. Longitudinal travel 450mm. - Maxi. grinding height 220mm. 	Each	1:16		√	√
6.	Cylindrical grinding machine with accessories	<ul style="list-style-type: none"> - Work head motor 0.2kW - Height of centre 135mm. - Motor rating 1.9KW - Distance between centres 600mm. - Maxi. length of grinding 550mm. - Work head speed 40-500 r.p.m. - External grinding wheel Ø400x76x127mm. 	Each	1:16		√	√
7.	Bench drilling machine with accessories	<ul style="list-style-type: none"> - Max. drill size Ø25mm. - MT 3 spindle (Morse taper) - Internal taper-MT3 - 3Phase, 380 V, 50Hz - Size of table 499x280mm. - Maxi. movement 115mm. 	Each	1:8	√	√	
8.	Pillar drilling machine with accessories	<ul style="list-style-type: none"> - Maxi. drill size Ø31mm. - MT3 spindle internal taper - Voltage: 380V – 3Phase - Maxi. movement 115mm. 	Each	1:16		√	√
9.	Pedestal grinding with eye shield	<ul style="list-style-type: none"> - Grinding wheel 32x50x300mm. - Motor power 1.5kW or 2.2Hp 	Each	1:16	√	√	√
10.	Bench grinding with eye shield	<ul style="list-style-type: none"> - Grinding wheel size Ø300x50x32mm. - Motor rating voltages: 380V. 	Each	1:16	√	√	√
11.	Portable power drillings machine with accessories	<ul style="list-style-type: none"> - Drill Chuck holding capacity Ø1-16mm. - Rated motor power:750W 	Each	1:16	√	√	√
12.	Power hacksaw machine with material stand	<ul style="list-style-type: none"> - Blade size 450x38x2mm. - Motor rated power: 1.1kW. 	Each	1:16	√		
13.	Hydraulic press machine (manual type)	<ul style="list-style-type: none"> - Max. 12tons 	Each	1:16	√		

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
14.	Gas welding equipment with accessories	- Oxy-Acetylene tool kit set	Each	1:4	√	√	√
15.	A.C welding machine (Transformer)	- Current 250 Amps - 3Phase - 60% duty circle	Each	1:4	√	√	√
16.	Hand operated shear machine (guillotine)	- Cutting length 820mm, thickness=1.5mm, - Table width 630mm. - Table length 980mm.	Each	1:8	√	√	
17.	Workshop bench	Wooden top with steel frame Dimensions: Length: 2000mm. Height: 800mm. Width: 820 mm. - With drawers	Each	1:2	√	√	√
18.	Arc welding bench	Dimensions: Length: 1000mm. Height: 500mm. Width: 700mm. - With steel top plate 8mm.	Each	1:4	√	√	√
19.	Gas welding bench (including fire bricks)	Dimensions: Length: 1200mm. Height: 800mm. Width: 700mm.	Each	1:4	√	√	√
20.	Heat treatment oven (furnace)	- Maxi. temperature 1100°C - Rated Power 1200W	Each	1:16		√	√
21.	Surface table (plate)	Dimensions 1000mmx1000mm.	Each	1:16	√	√	√
22.	Bench vice	Forged steel 100mm. width opening jaws	Each	1:2	√	√	√
		- Forged steel - 150mm width opening jaws	Each	1:2	√	√	√
23.	Steel cabinet	Dimensions: Height: 2100mm. Length: 1500mm. Width: 530mm.	Each	1:4	√	√	√
24.	Tool cabinet with drawers	Dimensions: Height 1055mm. Length 835mm. Width 780mm.	Each	1:16	√	√	√
25.	Angle grinders	- No of revolution 2800r.p.m - Related power: 0.75W - Supply current: 1.5Amp.	Each	1:8		√	√
26.	Rolling machine	Working length 1000 –1250mm. - Sheet thickness 3.5mm. - Upper roller 90mm. - Lower roller 80mm. - Motor power 1kW/0.75HP	Each	1:16	√	√	√
27.	Bending/folding machine	- Working length 1000 -1250mm.	Each	1:16	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- Max. Sheet thickness 1.5mm.					
28.	Hand bench shear	Pedding haus type - Max. Cut thickness 6mm. - Working blade length 150mm.	Each	1:16	√	√	√
29.	Classroom table	Dimensions: Length: 1200mm. Height: 700mm. Width: 720mm	Each	1:2	√	√	√
30.	Classroom chair	Dimensions: Length: 450x mm. Height: 420mm. Width: 400mm	Each	1:1	√	√	√
31.	Office chair	Dimensions: Length: 450mm. Height: 420mm. Width: 400mm	Each	1:1	√	√	√
32.	Office table	Dimensions: Length: 1500mm. Width: 800mm. Height: 720mm.	Each	1:1	√	√	√
33.	Anvil	Weight 50kg	Each	1:1	√	√	√
34.	Workshop stool	850mm. height	Each	1:4	√	√	√
35.	Low loading trolley	- Carrying capacity 1500kg Dimensions Length: 1500mm. Height: 750 mm. Weight: 500mm.	Each	1:16	√	√	√
36.	Compressor unit machine	- Supply voltage 380V - 3Phase - Displacement 475mm/min. - Free air discharge 320 ltrs/min. - Max. working pressure 10 bars - Motor rating: 4HP - Air tank: 100 litres	Each	1:16	√	√	√
37.	Chain block complete	- Max. 1.5 tons. - Lift/height 3m.	Each	1:16		√	√
38.	Hydraulic system kit complete	Training system with accessories e.g. - Board - Bench - Piston - Valve - Flexible pipes	Each	1:16		√	√
39.	Pneumatic system kit complete	Training system with accessories e.g. - Board	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		<ul style="list-style-type: none"> - Bench - Piston - Valve - Flexible pipes 					

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Files	Course and smooth 250 mm. Length	Set	1:1	√	√	√
		Single and double cut 200mm. Length	Set	1:1	√	√	√
		Needle: Different shapes	Set	1:4	√	√	√
2.	Measuring tools	Steel Rule (0-300) mm long.	Each	1:1	√	√	√
		Venier Callipers Combination (0-150)mm (0-200)mm, (0-300)mm.	Each	1:1	√	√	√
		Vernier Height: 300mm. Length	Each	1:1	√	√	√
3.	Try Square	100mm.Length	Each	1:1	√	√	√
		200mm. Length	Each	1:4	√	√	√
		300mm. Length	Each	1:4	√	√	√
4.	File Card	250mm. Length	Each	1:1	√	√	√
5.	Wire Brush	250mm. Length	Each	1:1	√	√	√
6.	Gauges	Radius: R1-R30mm.	Set	1:4	√	√	√
		Height: 250mm. Length	Each	1:4	√	√	√
			Each	1:8	√	√	√
		Plug: Go and Not Go 12,14,16,18,20,22,24, 28 and 30mm.	Set	1:8	√	√	√
		Snap: Go and Not Go 12mm, 14mm, 16mm,18mm, 20mm, 22mm, 24mm, 28mm and 30mm.	Set	1:16	√	√	√
		Thread Plug STD M16, M20 - M24 – M30	Set	1:16	√	√	√
		Thread Ring - STD M16, M20, M24-M30	Set	1:16	√	√	√
		Thread Pitch: - Metric system - Imperial system	Set	1:4	√	√	√
		Depth: (0-150)mm. Length	Set	1:4	√	√	√
		Thread tool: Combination	Each	1:4	√	√	√
		Filler: 0.01 – 1.00mm.	Set	1:2	√	√	√
		Block: 0 – 150mm.	Set	1:8	√	√	√
Drill Standard	Each	1:8	√	√	√		
7.	Protractor	Universal: 0-180 ⁰	Each	1:4	√	√	√
		Bevel: 0-180 ⁰		1:8	√	√	√
8.	Bevel Square	100mm.	Each	1:4	√	√	√
		200mm.	Each	1:4	√	√	√
9.	Hand Hacksaw	Adjustable/Fixed frame (300mm) Long	Each	1:1	√	√	√
10.	'V' Blocks	Dimensions: 100x75x50mm.	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
11.	Angle Plate	Dimensions: 300x300x400mm.	Each	1:8	√	√	√
12.	Centre Drill	Diameter (2-6)mm.	Set	1:4	√	√	√
13.	Surface Plate	Dimensions: 300x400mm.	Each	1:16	√	√	√
14.	Scriber	Bent one end 200mm.	Each	1:1	√	√	√
15.	Cold Chisels	Medium size	Set	1:1	√	√	√
16.	Punches	Pin: Medium size	Set	1:1	√	√	√
		Centre: 150mm.	Each	1:1	√	√	√
		Number: 8mm, 10 numerical	Set	1:16	√	√	√
		Letter: 8mm - 27 pieces	Set	1:16	√	√	√
17.	Hammers	Ball Pein: Weight 110g	Each	1:1	√	√	√
		Cross Pein: Weight 85g	Each	1:8	√	√	√
		Chipping Steel shaft with shock proof spring hand	Each	1:4	√	√	√
		Sledge: Weight 3kg	Each	1:8	√	√	√
		Rubber Mallet Standard 0.25kg/250g	Each	1:4	√	√	√
		Soft Plastic head: 500g	Each	1:4	√	√	√
		Greasing: Weight 500g	Each	1:4	√	√	√
18.	Counter Sink	45°x10 to 25mm. diameter	Set	1:16	√	√	√
19.	Counter Bore Drills	Diameter (6-8)mm, (8-10)mm, (10-12)mm, (12-16)mm and (16-20)mm.	Set	1:8	√	√	√
20.	Reamers	Hand (HSS) Diameter (4-24)mm.	Set	1:16	√	√	√
		Machine (HSS) Diameter (4-28)mm.	Set	1:16	√	√	√
		HSS Adjustable Diameter (18-30)mm.	Set	1:16	√	√	√
		Hand taper (HSS) Diameter (3-4)mm, (4-5)mm, (6- 7)mm, (7-8)mm, (8-9)mm and (9-10)mm.	Set	1:16	√	√	√
21.	Screw Driver	Flat, star /Phillips (2-7)mm.	Set	1:4	√	√	√
		Offset screw driver (2-5)mm	Set	1:4	√	√	√
22.	Pliers	Grip: 250mm. Length	Each	1:4	√	√	√
		Long nose covered with plastic cover handle 180mm. Length	Each	1:4	√	√	√
		Circlip internal 0-15mm. Length	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Circlip internal 0-20mm.	Each	1:4	√	√	√
		Circlip external 0-15mm. length	Each	1:4	√	√	√
		Circlip external 0-20mm.	Each	1:4	√	√	√
		Circlip bent type 0-20mm.	Each	1:4	√	√	√
		Pop Rivet: Diameter 2-6mm.	Each	1:8	√	√	√
		Side cutting: 0-25mm.	Each	1:2	√	√	√
		End cutting: 0-25mm.	Each	1:2	√	√	√
23.	Brushes	Bench: 250mm. long	Each	1:1	√	√	√
		Paint: 2"/50mm. width	Each	1:1	√	√	√
24.	Bars	Parallel - 8x10x100/150mm. - 10x10x100/150mm. - 12x10x100/150mm. - 14x10x100/150mm.	Set	1:16	√	√	√
		Crow: 350mm. Length	Each	1:8	√	√	√
25.	Dies	Stock Holding for M4-M30	Set	1:16	√	√	√
		M4-M30 STD threads	Set	1:8	√	√	√
		MF(12-20)x1.2mm.	Set	1:16	√	√	√
26.	Hand Taps	M4-16x1.5)mm.	Set	1:8	√	√	√
		MF12-20x2.5mm.	Set	1:16	√	√	√
27.	Tap wrench	Holding tap for M4-M20	Set	1:4	√	√	√
28.	Twist drills	Straight shank Diameter 0-13mm.	Set	1:2	√	√	√
		Taper Shank Diameter (13-32)mm.	Set	1:4	√	√	√
29.	Surface comparator	N5-N10, Surface smoothness	Each	1:4	√	√	√
30.	Turning tools	HSS 10x10x100mm.	Each	1:4	√	√	√
		HSS 12x12x200mm.	Each	1:4	√	√	√
		HSS 16x16x200mm.	Each	1:4	√	√	√
31.	Boring tools	Straight: Head 90 ⁰ mm.	Each	1:4	√	√	√
		Rough: head 45 ⁰ mm.	Each	1:4	√	√	√
32.	Threading tools	60 ⁰ External	Each	1:4	√	√	√
		55 ⁰ External	Each	1:4	√	√	√
		60 ⁰ Internal	Each	1:4	√	√	√
33.	Knurling tool	Diamond type	Set	1:4	√	√	√
34.	Edges	Straight type: 600mm.	Each	1:8	√	√	√
		Bevel type: 400mm.	Each	1:8	√	√	√
35.	Clamps	F. Clamps: 150-350mm.	Set	1:4	√	√	√
		G. Clamps: 150-250mm.	Set	1:4	√	√	√
36.	Spanners	Socket: 6-32mm.	Set	1:4	√	√	√
		Adjustable: 0-40mm. Opening	Set	1:8	√	√	√
		Combination metric 7-32mm A/F	Set	1:8	√	√	√
		Combination imperial	Set	1:16	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- Up to ¼ - 1 ¼ "					
		Pipe Wrench: 0-20mm opening 25 -75mm opening.	Each	1:8	√	√	√
37.	Dial Indicator	Plunger type	Each	1:4	√	√	√
		Magnetic type	Each	1:8	√	√	√
38.	Magnetic Stand	300 mm height	Each	1:4	√	√	√
39.	Milling cutters	Shell end Mill Diameter 30-100mm.	Set	1:4	√	√	√
		Gear Cutter Modul 1-8 set of 8 pieces)	Set	1:4	√	√	√
		Side and Face 4-18mm.	Set	1:4	√	√	√
40.	Spring Divider	250mm leg length.	Each	1:1	√	√	√
41.	Trammel	Adjustable: 1000mm.Long	Each	1:8	√	√	√
42.	Allen Key	Imperial: up to 1" Metric :Up to 12mm	Set	1:8	√	√	√
43.	Pedestal wheel dresser	Multi toothed wheels	Each	1:8	√	√	√
44.	Offset screw driver	100-200mm. Long	Set	1:8	√	√	√
45.	Guns	Soldering Min. 26mm. 500g	Each	1:8	√	√	√
		Grease $\varnothing(1/8 - 3/8)$	Each	1:4	√	√	√
		Oil $\varnothing(3/8 - 3/4)$					
46.	Blowing torch	(3-6)mm.	Each	1:8	√	√	√
47.	Broaching tools	(4-12)mm with all bushes and spacers	Set	1:8	√	√	√
48.	Spark lighter	Frint type	Each	1:4	√	√	√
49.	Blow lamp	0.5 ltrs.	Each	1:4	√	√	√
50.	Electrode Holder	500Amp.	Each	1:8	√	√	√
51.	Welding tongs	- Forged type - 300-450mm.	Each	1:4	√	√	√
52.	Gas Welding tool kit	Equipped with cutting and welding torches	Set	1:8	√	√	√
53.	Arc welding cable	\varnothing 10mm/20mmx10m long	Set	1:4	√	√	√
54.	Micrometer screw gauge	Outside Size: (0-25)mm, (25-50)mm, (50-75)mm, (75-100)mm.	Set	1:8	√	√	√
		Inside Size: (0-100)mm.	Set	1:8	√	√	√
55.	Safety gears	Asbestos type Welding shield	Each	1:1	√	√	√
		Asbestos type Welding helmet	Each	1:1	√	√	√
		Safety goggles, Plastic/transparent type	Pair	1:1	√	√	√
		Welding goggles Tinted type	Pairs	1:4	√	√	√
		Overall /overcoat	Each	1:1	√	√	√
		Industrial safety boots	Each	1:1	√	√	√
		Ear Muffs	Each	1:1	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Leather apron	Each	1:1	√	√	√
		Leather gloves	Pair	1:1	√	√	√
56.	Extension cable	Ø2.5 - 15m long.	Each	1:4	√	√	√
57.	Puller	25 - 300mm. leg length	Set	1:8	√	√	√
58.	Screw extractor	(2 -12)mm.	Set	1:4	√	√	√
59.	Slitting saw	1.5 – 4mm. Thickness	Set	1:8	√	√	√
60.	Oil Cans	Capacity: (0.25-0.5)ltrs.	Each	1:4	√	√	√
61.	Fire Extinguisher	Carbon dioxide, Capacity 25 kg	Each	1:4	√	√	√
		Dry powder type, capacity 25kg	Each	1:4	√	√	√
62.	Flip chart board	Magnetic type	Each	1:16	√	√	√
63.	Drawing board	Plates with T-square A3	Each	1:1	√	√	√
64.	Mechanical drawing instrument	Medium size	Set	1:1	√	√	√
65.	Brooms	Soft : Standard	Each	1:4	√	√	√
		Hard: Standard	Each	1:4	√	√	√
66.	Mop	450mm.	Each	1:4	√	√	√
67.	Dust Bin	For chips: Height: 1000mm. Length: 500mm. Width: 500mm.	Each	1:16	√	√	√
		For Rubbish: Dimensions Height: 1000mm. Length: 500mm. Width:500mm.	Each	1:16	√	√	√
68.	First Aid Box/kit	Equipped with medics	Each	1:16	√	√	√
69.	Oil stones	10x10x80mm. Coarse and fine	Set	1:4	√	√	√
70.	Engineers spirit level	With magnetic and groove contacts - Length 310mm. - Accuracy 0.03mm.	Each	1:4	√	√	√
71.	Screw driver	Philips No. 1-6		1:4	√	√	√
72.	Scraper	Flat 20x250mm.	Each	1:1	√	√	√
		Triangular 150mm. length	Each	1:1	√	√	√
73.	Marwa centering device	Straight shank 10mm.	Each	1:4	√	√	√
74.	Centre locator	Straight shank 10mm.	each	1:4	√	√	√
75.	Riveting Tool	Diameter (3-6)mm nose piece	Each	1:8	√	√	√
76.	Tinmans Snips	Straight, left and right	Set	1:4	√	√	√

**BASIC TOOLS AND EQUIPMENT FOR INSTRUMENT MECHANICS
(FOR 16 TRAINEES)**

A: EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Centre Lathe machine	<ul style="list-style-type: none"> - Centre height 165mm. - Distance between centres 850mm and chuck 160mm. - Drilling chuck with all accessories. 	Each	1:4	√	√	√
2.	Milling Machine Universal with all accessories	<ul style="list-style-type: none"> - Size of working surface 1000x260mm. - Longitudinal traverse 559mm. - Cross Traverse 220mm. - Vertical 460mm. 	Each	1:4		√	√
3.	Drilling machine pillar type with all accessories	<ul style="list-style-type: none"> - Drill capacity Ø31mm - Spindle speed (800 – 3500)r.p.m. - Spindle taper MT 3 	Each	1:16	√	√	√
4.	Surface grinding machine With all accessories	<ul style="list-style-type: none"> - Clamping surface of the table 600x300mm. - Max. 740x340mm. traverse - Rapid cross feed 3m/min. 	Each	1:10	√	√	√
5.	Workshop bench	Dimensions: Length: 2000mm. Height: 800mm Width: 820mm. with drawers Wooden top with steel frame	Each	1:2	√	√	√
6.	Steel cabinets/Tool boxes	Dimensions: Length: 2100mm. Height: 1500mm Width: 530mm.	Each	1:4	√	√	√
7.	Anvils	Weight 50kg Length: 570mm. Height: 220mm Width: 100mm.	Each	1:8	√	√	√
8.	Pumps	Assorted	Each	1:4		√	√
9.	Hydraulic system bench	Contain valves, pistons, cylinders and all accessories	Each	1:16	√	√	√
10.	Pneumatic system bench	Contain valves, pistons, cylinders and all accessories	Each	1:16	√	√	√
11.	Control system board	Contain all necessities components required for the system	Each	1:16		√	√
12.	Hydraulic/ press	2 Tons	Each	1:16	√	√	√
13.	Compressor	Supply voltage 380V.	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		<ul style="list-style-type: none"> - Maxi. working pressure 10bar - Motor rating 4HP - Air tank volume 100 Litres/min 					
14.	Electroplating unit	With all accessories	Each	1:16		√	√
15.	Bench drilling Machine	<ul style="list-style-type: none"> - Drill capacity Ø13mm. - Morse Taper 3 - Speed range 100 – 2000mm. - Size of table 499x280mm. 	Each	1:16	√	√	√
16.	Classroom table	Dimensions: Length: 1200mm. Height: 700mm Width: 720 mm.	Each	1:2	√	√	√
17.	Classroom chair	Dimensions: Length: 450mm. Height: 420mm Width: 400mm.	Each	1:1	√	√	√
18.	Office Chair	Dimensions: Length: 450 mm. Height: 420mm Width: 400mm.	Each	1:1	√	√	√
19.	Office Table	Dimensions: Length: 1500 mm. Height: 700mm Width: 720mm.	Each	1:1	√	√	√
20.	Tool cabinet	<ul style="list-style-type: none"> - Height 1055mm. - Width 835mm. - Depth 780mm. 	Each	1:16	√	√	√
21.	Workshop Stool	Height: 800mm.	Each	1:1	√	√	√
22.	Cub our press	Height: 250mm.	Each	1:16	√	√	√

B: TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Files	Assorted Single and double cut	Set	1:1	√	√	√
		Needle: 5" of 6 different shapes	Each	1:4	√	√	√
2.	Spanners	Assorted: (6-22)mm. A/F open end	Set	1:4	√	√	√
		Combination (6-22)mm. A/F	Set	1:4	√	√	√
3.	Screw driver	Assorted: (1-5)mm.	Set	1:4	√	√	√
		Assorted: (0.5-3)mm.	Set	1:4	√	√	√
4.	Scriber	Bent one end: 100mm.	Each	1:1	√	√	√
5.	Try Square	100mm. Length	Set	1:1	√	√	√
6.	MEASURING TOOLS (LINER)	Micrometer screw gauge Outside: (0 -25)mm.	Each	1:8	√	√	√
		25 – 50mm.	Each	1:8	√	√	√
		Venier caliper Analogue (0 – 150)mm Length	Each	1:1	√	√	√
		Venier caliper Digital: 250mm	Each	1:1	√	√	√
		Venier Height gauge 0 – 300mm	Each	1:8	√	√	√
7.	Punches	Assorted	Set	1:1	√	√	√
8.	Cold chisels	Assorted	Set	1:1	√	√	√
9.	Wire brush	200mm. Length	Each	1:1	√	√	√
10.	Shafts	Various diameters for fitting bearing exercises	Each	1:4		√	√
11.	Axles	Different size and diameters for practical exercise	Each	1:4		√	√
12.	Couplings	Different types	Each	1:4		√	√
13.	Pulleys	Different Sizes	Each	1:4		√	√
14.	Gear wheel	Different Sizes	Each	1:4		√	√
15.	Seals	Different types and sizes	Each	1:4			
16.	Drawing boards	A3 Size with T-square	Each	1:1	√	√	√
17.	Drawing instruments	Medium size containing all drawing instruments	Each	1:1	√	√	√
18.	Twist drills	Diameter 1 – 12mm.	Each	1:4	√	√	√
		Diameter 12– 20mm.	Set	1:4	√	√	√
19.	End mill cutter.	Diameter 4 – 20mm.	Each	1:4	√	√	√
		Diameter 30–60mm.	Set	1:4	√	√	√
20.	Parallel bars	8-12mm up to 36mm. width	Set	1:8	√	√	√
	Parallel clamps	(150 – 250)mm.	Set	1:4	√	√	√
21.	Vice	Hand: 0-50mm.	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Bench: Jaw opening 400mm.	Set	1:12	√	√	√
22.	Reamers	Machine: Diameter (4-16)mm.	Set	1:4	√	√	√
		Hand: Diameter (4-16)mm.	Set	1:4	√	√	√
		Taper: (4-5), (5-6), (6-7) and (7-8)mm.	Each	1:4	√	√	√
		Adjustable: (12-20)mm.	Each	1:4	√	√	√
23.	Hack saw frame	Adjustable: Fixed up to 300mm.Length	Each	1:1	√	√	√
24.	Pliers	Combination - 200mm.Length	Each	1:1	√	√	√
		Grip: 200mm.Length	Each	1:4	√	√	√
25.	Power hacksaw	- Blade size 350mmx38mmx3mm. - Power Motor rate 1.1 kW.	Each	1:16	√	√	√
26.	Allen keys	(2 -10)mm.	Each	1:4	√	√	√
27.	Turning tools HSS	Dimensions: 100mmx0mmx10mm.	Each	1:4	√	√	√
		- 12x12x100mm.	Each	1:4	√	√	√
		- 16x16x100mm	Each	1:4	√	√	√
		- 4x10x100mm.	Each	1:4	√	√	√
		- 16x16x200mm	Each	1:4	√	√	√
28.	Taps	- M4-M16, - M4- M12 , MF10–MF20	Each	1:4	√	√	√
			Each	1:4	√	√	√
29.	Dies	M4-M16	Each	1:4	√	√	√
		MF 10-20 (Metric fine)	Each	1:4	√	√	√
30.	Anvil stakes	Different shape	Each	1:16	√	√	√
31.	Boring tool for turning	Ø 8x 50mm length.	Each	1:4	√	√	√
32.	Soldering gun electric	Maxi. 75 Watt Tip Ø7mm.	Each	1:4	√	√	√
33.	Dial Indicator	Plunger type	Each	1:4		√	√
		Magnetic type	Each	1:4	√	√	√
34.	Multi meter	Range 500V.	Each	1:4		√	√
35.	Microscope	Magnifies 100%	Each	1:8		√	√
36.	Plug gauge	Diameter 4–16mm.	Each	1:16	√	√	√
37.	Hardness tester	With all accessories	Each	1:16		√	√
38.	Optical gauge	Different types	Each	1:8	√	√	√
39.	Oil Cans	Medium size	Each	1:4	√	√	√
40.	Screw extractor	Diameter 5mm.	Set	1:4	√	√	√
41.	First Aid box	With all medics	Each	1:16	√	√	√
42.	Temperature gauge	Up to 800°C	Each	1:4	√	√	√
43.	Cleaning machine	Vertical spindle	Each	1:16	√	√	√
44.	Pneumatic control devices	Valve, pistons, actuator	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
45.	Calibration testers	Varying from 0–100 bars	Each	1:4		√	√
46.	Monometers	Different types	Each	1:4		√	√
47.	Demagnetizer	Block type	Each	1:8		√	√
48.	Fire extinguisher	Co ₂ type	Each	1:8	√	√	√
		Dry powder type	Each	1:8	√	√	√
49.	Volume control	Complete with all accessories.	Each	1:8		√	√
50.	Sweeping broom	Soft type	Each	1:4	√	√	√
51.	Operational amplifiers	- Small and high signals - DC type	Each	1:4		√	√
52.	Safety gears	Overall/Over coat	Each	1:1	√	√	√
		Industrial boot	Set	1:1	√	√	√
		Safety goggles	Set	1:1	√	√	√
		Ear plug /muff	Set	1:1	√	√	√

**BASIC TOOLS AND EQUIPMENT FOR MECHANICAL DRAUGHTING
(FOR 20 TRAINEES)**

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Printing Machine	- Blue Print Machine or white print Machine complete - A0 size sheet white print of ammonia paper sheet	Each	1:20		√	√
2.	Computer with Auto CAD programme	Pentium 4 processor or above.	Set	1:4	√	√	√
3.	Plotter	Ao size for printing purpose of Architectural and engineering drawings.	Each	1:20		√	√
4.	Shear Machine	- Metal/Wooden material A4 size - Trimming Machine A4-A0	Each	1:20	√	√	√
5.	Multimedia	With all accessories.	Each	1:20		√	√
6.	Classroom chairs	Dimensions: Height 450mm Length: 420 mm. Width: 400mm..	Each	1:1	√	√	√
7.	Office Chairs	Dimensions: Height: 450mm Length:420mm Width: 400mm.	Each	1:1	√	√	√
8.	Classroom tables	Dimensions: Height: 720mm. Length: 1200 mm Width: 700mm.	Each	1:1	√	√	√
9.	Office tables	1500x700x720mm.	Each	1:1	√	√	√
10.	Cabinet (wooden)	Height 800mm.	Each	1:1	√	√	√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Universal Drawing Board	Movable - Size 650x350mm. - Plaster coated board. Horizontal ruler with quadrant in millimeter with drawing board stand.	Each	1:1	√	√	√
2.	Drawing table	Portable Size 650x900mm. plastic faced complete with T-square 30°-60°, Set square 45°, Architects scale, protractor, French curve, cello tape, pencils eraser, pencil point, ink (complete set on each item).	Each	1:1		√	√
3.	Drawing set (Geometrical drawing set or Mathematical drawing set)	- Contain 12cm self centering geared head compass with knee joint and survival needle, pencil, pen and divider. - Attachments lengthening bar, centre screw.	Each	1:1	√	√	√
4.	Flexible curve	Non slip plastic	Each	1:4	√	√	√
5.	Scale ruler	- Engineering scale - Triangular shape, plastic – white colour - Length 300mm. - Professional Bamboo white.	Each	1:1	√	√	√
6.	Erasing shield	- Non corroded material - Used to rub unwanted portion in a drawing.	Each	1:1	√	√	√
7.	Sharpeners	- Pencil Sharpener - With dial selector for sharpening six sizes pencils. - Spare cutter	Each	1:4	√	√	√
8.	Tracing paper	- Transparent paper which does not spread drawing ink	Roll	1:20	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
9.	Sketching paper	- Transparent paper, used for sketching drawing - 50/90g	Roll	1:20	√	√	√
10.	Design blocks	No.4A	Each	1:4	√	√	√
11.	M.M. Block	No. 4A	Each	1:4	√	√	√
12.	Drawing pen	- Set of 4 pens size ranges from 0.2, 0.3, 0.4 and 0.5, or 0.25, 0.35, 0.5 and 0.7mm. - Technical interchangeable nibs in sizes. - Wrench for easy removal of rub.	set	1:1	√	√	√
13.	Protractor	- Transparent - Graduated from 0° -180° (medium size) - Pace Maker protractor (geometry and trigonometry)	Each	1:1	√	√	√
14.	Lettering stencil	- Lettering triangle (45°) 12.25cm.	Each	1:4	√	√	√
		- Lettering stencil for various pens 0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.7, 0.8, 1.0, 1.2, and 1.4(mm) - Transparent - Plastic material - Complete set.	Set	1:4	√	√	√
15.	Refill drawing lead	2H, 3H, 4H, 5H, H and HB (one gross of each grade of pencil)	Box	1:4	√	√	√
16.	Compass leads	3mm thick	Box	1:4	√	√	√
17.	Master ellipses projection	- Of 10°, 20°, 30°, 40°, 50° and 60° - Size 125x230mm. Metric and imperial (two each).	Each	1:5	√	√	√
18.	Cap screw	Top and body Drill size 145x250mm.	Each	1:5	√	√	√
19.	Geometric designer	- Size 120x200mm.	Each	1:4	√	√	√
20.	Professional Planner	Size 240x250mm.	Each	1:4	√	√	√
21.	Templates	Window: 16 standard size 150x180(mm). - Material plastic	Each	1:4		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Furniture: - Size 150x180mm. - Plastic Material	Each	1:4		√	√
		Hexagon Bolts and nuts: - Size 150x180(mm). - Plastic Material	Each	1:4		√	√
		Plumbing Fixture: - Scale 6.5mm. size (145x250)mm. (plan views) - Scale 12.5mm. size 145mm.	Each	1:4		√	√
		Circle: Scale 1:50 - Material plastic	Each	1:4		√	√
		Welding: - Material plastic	Each	1:4		√	√
		Radio Template - Plastic Material	Each	1:4		√	√
		Architectural template - Plastic material	Each	1:4		√	√
		Chemistry template: - Plastic Material.	Each	1:4		√	√
22.	Spare pints	0.25mm, 0.35mm, 0.5mm. and 0.7mm. (each two)	Each	1:1	√	√	√
23.	Coloured pencils	Wallet of 12 assorted coloured pencils	Each	1:1	√	√	√
24.	Ammonium paper	Change colour from yellow to blue when printing on process Store in black colour plastic tube materials	Roll	1:10		√	√
25.	Pin box or drawing pins	- Steel, Thumb tag	Box	1:10	√	√	√
26.	Masking tape	- Adhesive paper	Dozen	1:4	√	√	√
27.	Cello tape	- Transparent tape plastic material	Dozen	1:4	√	√	√
28.	Scotch tape	- Used to join horn and worn out papers.	Dozen	1:2	√	√	√
29.	Calculator	Scientific solar powered	Each	1:4	√	√	√

**BASIC TOOLS AND EQUIPMENT FOR MACHINE TOOL REPAIR
(FOR 16 TRAINEES)**

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Power Hacksaw machine with material stand	<ul style="list-style-type: none"> - Capacity Ø210mm. - Stroke per minute 45, 57, 75, 90, 114, 150(mm). - Blade dimension 450x38x3mm. 	Each	1:16	√	√	√
2.	Bench drilling machine with accessories	<ul style="list-style-type: none"> - Maxi. drill size 25mm. - MT3 Spindle - 380V/3Phase - Maxi. quill movement 115mm. 	Each	1:16	√	√	√
3.	Pillar drilling machine with accessories	<ul style="list-style-type: none"> - Drill capacity 31mm. - Spindle speed 8: 2000–3500r.p.m. - Spindle internal taper MT3 	Each	1:16	√	√	√
4.	Portable electric drilling machine	<ul style="list-style-type: none"> - Drill capacity Ø 0-16mm, - Rated power: 750W 	Each	1:8	√	√	√
5.	Pedestal grinding machine complete with eye shield	<ul style="list-style-type: none"> - Grinding wheel size Ø300x32x52 (mm). - Motor power 1.5kW/2.2HP 	Each	1:16	√	√	√
6.	Angle grinder	<ul style="list-style-type: none"> - Power source: 2000W at 240V respectively - Single phase, - Disc 9" or 230mm. 	Each	1:8	√	√	√
7.	Centre Lathe with accessories	<ul style="list-style-type: none"> - Centre height 195mm. - Distance between centre 1000mm. - Maxi. turning over bed Ø300mm. - Maxi. travel of cross slide 200mm. - Maxi. travel of top slide 120mm. 	Each	1:8	√	√	√
8.	Surface grinding machine with accessories	<ul style="list-style-type: none"> - Working surface with 150x450mm. - Magnetic table - Max. Traverse travel 180mm. - Max. Longitudinal travel 480mm. - Max. grinding width 190mm. - Table speed 1–12m/ minute 	Each	1:16		√	√
9.	Universal milling machine with complete equipment including slotting attachment.	<ul style="list-style-type: none"> - Universal working table 1000x260 mm. - No. of T Slots 3 - Longitudinal traverse 659mm. 	Each	1:16	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		<ul style="list-style-type: none"> - Cross traverse 220 mm. - Vertical traverse 460mm. - Swivel of table +/- 45° - No. of feeds 12 - Main motor 4HP - Quick traverse motor 0.5HP - Coolant pump motor 0.1HP 					
10.	Shaping machine (shaper) complete with all accessories	<ul style="list-style-type: none"> - Max. Stroke 450mm. - Longitudinal traverse 500mm. - Vertical traverse 305mm. - Table dimension 450x300x300(mm). - Rated Motor power: 2HP - 3 Phase, V=380v. 	Each	1:16	√	√	√
11.	Surface table (plate)	Sizes 1000x1000(mm).	Each	1:16	√	√	√
12.	Hand bench shear.	<ul style="list-style-type: none"> - Max. cut thickness 8mm plate - Round bar cut thickness 16mm. - Cutting length 150 mm. 	Each	1:8	√	√	√
13.	Hydraulic Press machine	Max. 40 tons	Each	1:16	√	√	√
14.	Workshop bench	Dimensions: Length: 2000mm Height: 800mm Weight: 820mm. with drawers.	Each	1:2	√	√	√
15.	Cylindrical grinding machine with accessories	<ul style="list-style-type: none"> - Height of centres 135mm. - Distance between centres 600mm - Maxi. length of grinding in one setting up 550mm. - Taper in work head spindle and tail stock MT4/MT3 - Table speed 0–6m/min - External grinding wheel size Ø25x25x51mm. - External grinding speed 2400r.p.m - With grinding wheel balancing attachment 	Each	1:16		√	√
16.	Honing machine with accessories	<ul style="list-style-type: none"> - Max. honing Ø260mm. - Min. honing Ø25mm - Max. length of stroke 465mm. - Max. honing length 550mm. - Spindle speed, (0-300)r.p.m. 	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- Stroke speed (0-20)m/min.					
17.	Bench vice (All steel)	- Forged steel - 150mm. width opening	Each	1:2	√	√	√
18.	Air Compressor set machine	- Supply 380V–3Phase - Displacement 475mm/min. - Free air discharge 320 ltr/min. - Max. pressure 10bar - Motor rating 4HP - Air tank 100 litres.	Each	1:16		√	√
19.	Low loading trolley	- 1500 kg capacity - 1500x750x500(mm).	Each	1:16	√	√	√
20.	Chain block with accessories	- Max. load 1.5Tons - Lift: 3m.	Each	1:16	√	√	√
21.	Steel cabinet	Dimensions: Height: 2100mm. Length: 1500mm. Width: 530mm.	Each	1:8	√	√	√
22.	Tool cabinet with drawers	Dimensions: Height: 1055mm. Length: 835mm. Width: 780mm.	Each	1:16	√	√	√
23.	Classroom chair	Dimensions: Height: 450mm. Length: 420mm. Width: 400 mm.	Each	1:1	√	√	√
24.	Office chair	Dimensions: Height: 450mm. Length: 420mm. Width: 400mm.	Each	1:1	√	√	√
25.	Office table with cabinet and drawers	Dimensions: Length: 1500mm. Height: 720mm. Width: 700mm.	Each	1:1	√	√	√
26.	Workshop stool	850mm. height	Each	1:1	√	√	√
27.	Fire extinguisher	CO ₂ type and dry powder 25kg	Each	1:8	√	√	√
28.	Hydraulic training kit system bench/board	Complete with - Piston, Valves - Flexible pipes	Each	1:16		√	√
29.	Pneumatic training kit system bench/board	Complete with - Piston, Valves - Flexible pipes	Each	1:16		√	√
30.	A.C. Welding machine (Transformer)	- 250Amps, 3Phase - 60% duty circle	Each	1:16	√	√	√
31.	Gas welding plant complete with	Complies with standards.	Each	1:16	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
	accessories						
33.	Welding bench for Arc welding	Dimensions: Length: 1000mm. Height: 700mm. Width: 500mm. Steel made	Each	1:16	√	√	√
34.	Gas welding bench including fire bricks	Dimensions: Length: 1200mm. Height: 800mm. Width: 700mm. Steel made.	Each	1:16	√	√	√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Files	Assorted: 5x250(mm).	Set	1:4	√	√	√
		Single cut and Double cut: 5x250(mm).	Set	1:4	√	√	√
		Needle 150mm. different shapes	Set	1:4	√	√	√
		Thread (Metric) - 250mm. length	Each	1:4	√	√	√
2.	Spanners	Combination: 6-22mm.A/F	Set	1:4	√	√	√
		Adjustable 0 – 40mm. opening jaw	Each	1:4	√	√	√
		Pipe wrench 0-75mm. opening jaw	Each	1:8	√	√	√
3.	Pliers	Combination: 150mm. Long	Ea	1:8	√	√	√
		Long nose: 150mm. Long	Each	1:4	√	√	√
		Circlip: External, 150mm.	Each	1:4	√	√	√
		Circlip: Internal, 200mm.	Each	1:4	√	√	√
		Circlip: bent type, 150mm. - External	Each	1:4	√	√	√
		Circlip: bent type - 200mm. - Internal	Each	1:4	√	√	√
4.	Pop rivet gun	Ø2-6mm.	Ea	1:8	√	√	√
5.	Punches	Drift: Assorted types	Set	1:4	√	√	√
		Hole: 4-40mm.	Set	1:6	√	√	√
		Number: 4-8mm.	Set	1:16	√	√	√
		Letter: 4-8mm.	Set	1:16	√	√	√
6.	Flat chisel	150mm long	Set	1:4	√	√	√
7.	Taps	M4-M20	Set	1:8	√	√	√
8.	Dies	M4-M16	Set	1:8	√	√	√
9.	Pullers	Two legged - Max. Spread 250mm. - Max. each 200mm Three legged - Max. Spread 250mm. - Max. reach 200mm.	Set	1:8	√	√	√
10.	Hammers	Ball pein: Weight 800g	Set	1:4	√	√	√
		Sledge: Weight 0.5kg	Each	1:4	√	√	√
		Straight pein: Weight 800g	Each	1:4	√	√	√
		Cross pein: Weight 800g	Each	1:4	√	√	√
		Copper headed: Weight 1.5Kg	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII	
		Rubber Mallet: Standard	Each	1:4	√	√	√	
		Soft (Plastic) Weight 0.8kg	Each	1:2	√	√	√	
		Chipping: Weight 500g	Each	1:4	√	√	√	
11.	Scriber	- Bend at one end. - Hardened and tempered. Ø4x250(mm)	Set	1:1	√	√	√	
12.	Divider	250mm.Leg length	Set	1:8	√	√	√	
13.	Screw drivers	Flat No. 1,3,5	Set	1:4	√	√	√	
		Off set: For Philips head No. 1, 2 and 4	Set	1:4	√	√	√	
		Off Set: For slotted head Length 86-175mm	Set	1:4	√	√	√	
		Phillips/star Number 1- 6mm.	Set	1:8	√	√	√	
14.	Scraper	250mm length	Each	1:4	√	√	√	
15.	Allen Keys	Metric: (2-14)mm A/F.	Set	1:4	√	√	√	
		Imperial $\frac{1}{16}$ " – $\frac{1}{2}$ " A/F	Set	1:8	√	√	√	
16.	Hand Snips	Left handed	Each	1:4	√	√	√	
		Right handed	Each	1:4	√	√	√	
		Straight Type	Each	1:4	√	√	√	
17.	Screw extractor	(2-12)mm.	Set	1:4	√	√	√	
18.	Tap wrench	For Tap M4-20mm.	Set	1:8	√	√	√	
19.	Die stock	For Die M4-M16mm.	Set	1:8	√	√	√	
20.	Measuring tools	Steel rule (0-300)mm. Long	Each	1:1	√	√	√	
		Vernier Callipers(0-150)mm						
21.	Micrometers gauge	screw	Outside: (0-25)mm.	Each	1:4	√	√	√
			Outside: (25-50)mm.	Each	1:4	√	√	√
			Outside: (50-75)mm.	Each	1:8	√	√	√
			Outside: (75-100)mm.	Each	1:8	√	√	√
			Inside: (0-25)mm.	Set	1:8	√	√	√
			Inside: (25 -50)mm.	Set	1:8	√	√	√
			Inside: (50-75)mm.	Set	1:8	√	√	√
			Inside: (75-100)mm.	Set	1:8	√	√	√
22.	Gauge	Depth: 150mm.	Each	1:4	√	√	√	
		Filler: (01-1.0)mm.	Set	1:1	√	√	√	
		Metric thread pitch (0.1–6)mm.	Set	1:4	√	√	√	
		Imperial thread pitch Standard	Set	1:8	√	√	√	
		Vernier height: 500mm.	Each	1:16	√	√	√	
		Thread Tool: Combination	Each	1:4	√	√	√	
		Drill standard	Each	1:4	√	√	√	
		Plug: Ø(4-30)mm.	Set	1:16	√	√	√	

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Radius: 1R-25R	Set	1:8	√	√	√
23.	Edge	Straight: 1000mm long.	Each	1:4	√	√	√
		Bevel: 600mm.	Each	1:8	√	√	√
24.	Hand hacksaw frame	Fixed/adjustable up to 300mm.	Each	1:1	√	√	√
25.	Tool boxes	440x160x190(mm). Steel made	Each	1:1	√	√	√
26.	Wire brush	250mm. Length	Each	1:2	√	√	√
27.	Torque wrench	0 – 75Nm	Each	1:4	√	√	√
28.	Hand reamer	Ø4 -28mm.	Set	1:8	√	√	√
29.	Surface comparator	N5 – N10	Each	1:8	√	√	√
30.	Boring tool	Straight: Ø10mmx80mm.			√	√	√
31.	Twist drill	Straight shank Ø1 -13mm.	Set	1:4	√	√	√
		Tapered shank Ø13mmx36mm.	Set	1:4	√	√	√
		Centre drill: Ø2-6mm.	Set	1:2	√	√	√
32.	Milling cutters	End: Ø(6 -20)mm.	Set	1:8		√	√
		Key- way: Ø3 – 16mm.	Set	1:4		√	√
		Woodruff key Ø4-12mm.	Set	1:8		√	√
		Shell end: Ø30 – 100mm.	Set	1:8		√	√
		Gear: Modul 1- 8 (each set 8 pieces)	Set	1:8		√	√
33.	Counter sink bit	Ø45x(10-30)mmx45°.	Set	1:8	√	√	√
34.	Turning Tools	HSS 10x10x100mm.	Each	1:4	√	√	√
		HSS 12x12x100mm.	Each	1:4	√	√	√
		HSS 16x16x200mm.	Each	1:4	√	√	√
		HSS 20x20x200mm.	Each	1:4	√	√	√
35.	Clamps	Parallel 300mm. length	Each	1:4	√	√	√
		Parallel 400mm. length	Each	1:4	√	√	√
36.	Broaching tool	Hand type (3 -12)mm. with bush and spacer	Set	1:8	√	√	√
37.	Helicoil	M4 – M20	Set	1:8		√	√
38.	Screws	Assorted sizes	Each	400	√	√	√
39.	Bolts	Assorted sizes	Each	200	√	√	√
40.	Nuts	Assorted sizes	Each	200	√	√	√
41.	Washers	Assorted sizes	Each	600	√	√	√
42.	Gears and sprockets	Assorted for spares	Each	20	√	√	√
43.	Pulley	Assorted type	Each	20	√	√	√
44.	Belts	Assorted type	Each	100	√	√	√
45.	Machine clutches	Assorted type	Each	20		√	√
46.	Couplings	Assorted type	Each	20		√	√
47.	Bearings	Assorted type	Each	60		√	√
48.	Valves	Assorted type	Each	20		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
49.	Seals	Assorted for: Oil, Water	Each	200	√	√	√
50.	Parallel bar	(8 – 12)mm thickness (10–36)mm width x 100mm length	Set	1:8	√	√	√
51.	Dial indicator	Plunger type	Each	1:4	√	√	√
52.	Magnetic Stand	300mm. Length	Each	1:4	√	√	√
53.	Try square	150mm. length	Each	1:1	√	√	√
54.	File Card	200mm. length	Each	1:1	√	√	√
55.	Shaping Machine tool	Left, Right and Straight 250mm. length	Set	1:4	√	√	√
56.	Bevel square	100mm.	Each	1:1	√	√	√
57.	Safety gears	Welding shield Asbestos type	Each	1:1	√	√	√
		Welding Goggles Tinted goggles	Each	1:1	√	√	√
		Clear goggles	Each	1:1	√	√	√
		Gloves: Leather type	Each	1:4	√	√	√
		Masking: Respiratory	Each	1:1	√	√	√
		Ear plug/muff	Each	1:1	√	√	√
		Apron: Leather type	Each	1:1	√	√	√
58.	First Aid Box	With medics	Each	1:16	√	√	√
59.	Fire Extinguisher	Co ₂ type, capacity 25kg	Each	1:8	√	√	√
		Dry powder foam, capacity 25kg	Each	1:8	√	√	√
60.	Grease gun	Standard small/hand operated	Each	1:4	√	√	√
61.	Oil can	Standard	Each	1:4	√	√	√

BASIC TOOLS AND EQUIPMENT FOR PATTERN MAKING AND FOUNDRY (FOR 16 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Sand mixing plant with all complete accessories	Capacity 200 – 300kg per bunch	Set	1:16	√	√	√
2.	Moulding box assorted	250 - 1000mm.	Set	1:2	√	√	√
3.	Moulding tool kit	Assorted	Set	1:1	√	√	√
4.	Cupola Furnace with accessories	500Kg/h	Each	1:16		√	√
5.	Crucible Furnace	Oil Fired, capacity:100kg	Each	1:16		√	√
6.	Core Sand mixer with accessories	- With rotor and rubbing plates. - Capacity 50kg	Each	1:16	√	√	√
7.	Core drying oven (electric) with accessories	Min. Dimension 600x600x600mm. Power rating 10KW.	Each	1:16	√	√	√
8.	Sand blasting machine with accessories abrasives	Manual operated	Each	1:16	√	√	√
9.	Pedestal grinding machine with accessories	Wheel Ø300x75x50mm.	Each	1:16	√	√	√
10.	Shake out machine	750 x 750mm.	Each	1:16	√	√	√
11.	Pouring ladle	10-50 kg. - Cap assorted	Each	1:1	√	√	√
12.	Weighing scale	Range 0- 10Kg	Each	1:16	√	√	√
		Range 0-200Kg	Each	1:16	√	√	√
13.	Moulding machine with accessories	Plain or jolt squeeze (roll over – turnover)	Set	1:16	√	√	√
14.	Compact air compressor with accessories	Min. 100 litres/10 bars	Set	1:16	√	√	√
15.	Over head crane with accessories	Capacity 5 tons	Set	1:16	√	√	√
16.	CO ₂ Gas Cylinder	Capacity 20kg.	Each	1:8	√	√	√
17.	Moisture tester	Standard	Each	1:16			
18.	Permeability meter	Standard	Each	1:16			
19.	Green sand hardness tester	Standard	Each	1:16			
20.	Wheel barrow	Capacity: 100Kg.	Each	1:4	√	√	√
21.	Working bench with tool drawers	Dimensions: Length: 2100mm Height: 800mm. Width: 1100mm.	Each	1:2	√	√	√
22.	Greasing gun	66cm ³ .	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
23.	Mechanical sieve shaker	Complete with sieves and accessories	Set	1:16	√	√	√
24.	Arc Welding machine / A.C	250 Amps/ 60% duty circle	Each	1:16	√	√	√
25.	OXY – Acetylene gas plant with all accessories	- Oxygen cylinder 172bar - Acetylene 14.5bar	Each	1:16	√	√	√
26.	Angle grinder	- Maxi. disc Ø180mm. - Speed 8000 r.p.m (variable) - Power 1700W	Each	1:8	√	√	√
27.	Pillar drilling machine with accessories	- Morse taper: MT 3 - Max. Quil Movement 115mm. - Maxi. Holding drill off size Ø31mm.	Each	1:16	√	√	√
28.	Portable drilling machine	- Variable speed 1&2 - Max. drill size 16mm. - Power 750W	Each	1:8	√	√	√
29.	Bench Vice	- Forged steel - 150mm Opening width	Each	1:8	√	√	√
30.	Tool Cabinet	- Steel Dimensions: Length: 2100mm. Height:1000mm. Width: 550mm. -With Drawers and shelves	Each	1:8	√	√	√
31.	Fumes extractor plant with accessories	- Flexible horses and hoods. - Ø150mm intake. - Ø110mm discharge	Set	1:16	√	√	√
32.	Low-Loading transport trolley	- Top Dimension 2500x750mm. - Height 500mm. - Wheel Ø400x100mm.	Set	1:16	√	√	√
33.	Fire extinguisher unit	- Dry powder foam. - 25kg	Each	1:8	√	√	
		- CO ₂ , 25kg	Each	1:8	√	√	
34.	Classroom chair	Dimensions: Length: 450mm. Height: 420mm. Width: 400mm.	Each	1:1	√	√	√
35.	Office Table with side Cabinet and drawers	Dimensions: Length: 1500mm. Height: 720mm. Width: 800mm.	Each	1:1	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- Hardwood made top					
36.	Classroom table	Dimensions: Length: 1200mm. Height: 700mm. Width: 4720mm.	Each	1:2	√	√	√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Air bellow	1.5 litres	Each	1:1	√		
2.	Spanner	Assorted	Set	1:4	√	√	√
		Combination 8 – 22mm. A/F	Set	1:4	√	√	√
		Steel forged	Set	1:4	√	√	√
3.	Grease Gun	66.cm ³	Each	1:4	√	√	√
4.	Blowing Gun	For Compressed air	Each	1:8	√	√	√
5.	Spray Gun	Pneumatic operated	Each	1:8	√	√	√
6.	Spraying can	200 Mils	Each	1:8	√	√	√
7.	Rammers	Hand operated Light duty	Each	1:1	√	√	√
		Air operated Light duty	Each	1:8	√	√	√
8.	Painting Brush	(1½ - 3) inches	Set	1:1	√	√	√
9.	Drawing plate	- With T- Square - A3 size	Each	1:1	√	√	√
10.	Geometrical drawing instruments with accessories	Medium size including: divider, compass and small items	Set	1:1	√	√	√
11.	Set Squares	(45°- 45°)x90°	Set	1:1	√	√	√
		(30°- 60°)x90°	Set	1:1	√	√	√
12.	Protractor	0°-180°	Each	1:1	√	√	√
13.	Scale rule	Range from (0-300)mm	Each	1:1	√	√	√
14.	Drill Bit	- HSS, (2-13)mm.	Each	1:4	√	√	√
15.	Shovels	Standards	Each	1:2	√	√	√
16.	Flexible Horse Pipe	¼" or 3/8"x10m with connectors	Each	1:8	√	√	√
17.	Cold Chisel	Assorted	Set	1:4	√	√	√
18.	Tongs	Length 600mm.	Each	1:1	√	√	√
19.	Sash Clamps	400–750mm. Length F- Type	Set	1:4	√	√	√
20.	Strickle off Bars	600mm. Length	Each	1:1	√	√	√
21.	File	- Bastard, Course	Each	1:1	√	√	√
22.	Hammers	Plastic: Weight: 500g	Each	1:2	√	√	√
		Sledge: (3-10)kg, Set of 4	Set	1:8	√	√	√
		Ball pein: Weight: 1kg.	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
23.	Safety gears	Hand Skimmer	Each	1:2	√	√	√
		Helmet, overall/dust coat	Each	1:1	√	√	√
		Mask/Respirators	Each	1:1	√	√	√
		Foundry Shield, Tinted	Each	1:2	√	√	√
		Safety Goggles, Clear	Each	1:1	√	√	√
		Asbestos Gloves	Pair	1:2	√	√	√
		Asbestos Apron	Each	1:2	√	√	√
		Safety Boots Equipped with metal guard	Pair	1:1	√	√	√
		Ear Muff	Each	1:1	√	√	√
		Leggings, Asbestos Material	Each	1:1	√	√	√
24.	Stop watch	Standard size	Each	1:8	√	√	√
25.	Screw Driver	Flat and Star, (3 – 7)mm. Black tip	Set	1:8	√	√	√
26.	Punches	Letter: Size (6 – 10)mm. - 27 pieces	Set	1:16	√	√	√
		Number (size 10 mm) - 0 - 9	Set	1:16	√	√	√
27.	Pliers	Grip: 250mm. length - Capacity: 30mm opening	Pair	1:4	√	√	√
28.		Combination - Plastic covered - 200mm length.	Pair	1:2	√	√	√
29.	Try Square	300mm. Length	Each	1:2	√	√	√
30.	Tape Measure	3M-5M	Each	1:	√	√	√
31.	First Aid Kit	Equipped with all necessary medics	Each	1:16	√	√	√

**BASIC TOOLS AND EQUIPMENT FOR TOOL AND DIE MAKING
(FOR 16 TRAINEES)**

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Tensile testing machine complete	- With accessories - 10kN	Each	1:16			√
2.	Impact testing machine	- With accessories - 10kN	Each	1:16			√
3.	Furnace	Hardening - Internal size 300x400x750mm. - Max. Temperature 1200°C.	Each	1:16		√	√
		Tempering - Internal dimension 300x400x750mm. - Max. Temperature. 650°C.	Each	1:16		√	√
4.	Hardness tester	Stationary - Level loading KN 0.98m. - 260mm Jaw height. - 150mm Jaw depth	Each	1:16		√	√
		Portable Measuring range - Rockwell 0-70 HRC - Brinell 80-500mm - 90mm height. 215x 160mm. external dimension.	Each	1:16		√	√
		Rockwel/Brinell and Vickers Diamond for HRC 0.5- 0.75 Carat/0.5. Diamond for Vickers Balls for Brinell tester Ø1/16", Ø5mm and Ø10mm. Microscope. Magnification (x100)	Set	1:16		√	√
5.	X-ray machine	- Gamma ray equipment - X-Ray tube size = I.S.O - X-ray films.	Each	1:16		√	√
6.	Pillar drilling machine	- Drill size Ø0-31mm. - MT3 Spindle. - Max. quil movement 115mm. - Power source:380V AC 50Hz :3 Phase	Each	1:8	√	√	√
7.	Universal Milling machine with accessories	Common purpose - Power source: 380V AC 50Hz.	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		:3 phase. - Table dimension 1300mmx305mm. - Longitudinal table travel 960mm. - Vertical table travel 455 mm. - Spindle nose size Ø40 mm. - Number of spindle speed 12. - Spindle speed 90-2240 r.p.m.					
		Special purpose - Distance from spindle to overam 162mm. - Working surface 1000x260 mm. - Number of T.Slots 3 - Longitudinal traverse 659mm. - Cross traverse 220mm. - Vertical traverse 460mm.	Each	1:16		√	√
8.	Pedestal grinding machine with plastic bush and wheel dresser	- Grinding wheel size Ø300x32x52(mm). - Distance between grinding wheels 428mm.	Each	1:8		√	√
9.	Centre lathe machine with accessories	- Centre height 195mm. - Distance between centres 1000mm. - Maxi. turning diameter over bed 300mm.	Each	1:4		√	√
10.	Co-ordinate drilling machine with accessories	- Digital read out. - Three Phase - Power supply 380V-50Hz.	Each	1:16		√	√
11.	Hydraulic Pressing machine.	Bench type - 12tons capacity. - Stroke 110mm. - Maxi. height 310mm.	Each	1:16	√	√	√
12.	Hydraulic power Hacksaw with accessories	- Holding capacity 0-210mm. - Metering 45°x125 mm. - Blade size 350x38x3(mm).	Each	1:16	√	√	√
13.	Surface grinding machine with accessories	- Working surface width 150mm. - Length 450mm. - Max. Traverse 180mm. - Max. Longitudinal travel 480 mm. - Grinding width 190mm. - Grinding wheel motor power 2HP. - Max. Speed 2860 r.p.m.	Each	1:16		√	√
14.	Universal tool and	- Working surface 920x140 mm.	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
	cutter grinder with accessories	<ul style="list-style-type: none"> - Longitudinal movement 450 mm - Cross movement 225mm. - Swivel of table +/- 45° - Height of centre 125mm. - Grinding head motor power 0.85Hp. - Drive motor power 1.1HP. - Circular grinding motor 0.25 HP. 					
15.	Shaping machine with accessories	<ul style="list-style-type: none"> - Max. stroke 450mm. - Longitudinal traverse 500mm. - Vertical traverse 305mm. - Table dimension 450x300x300(mm). - Power source: 2HP. - 380V, AC 50Hz, 2HP, 3Phase. 	Each	1:16		√	√
16.	Eccentric shaft press with accessories	<ul style="list-style-type: none"> - Press force 1250kN - Press bed dimension 1000x 600mm. - Bed plate dimension 995x 600mm. - Motor rating 15HP. 	Each	1:16		√	√
17.	Band sawing machine with accessories	<ul style="list-style-type: none"> - Working distance 420 mm - Motor rate 3Phase, 380V. - 1.1HP 	Each	1:16	√	√	√
18.	Universal engraving machine with accessories	<ul style="list-style-type: none"> - 3Phases, 380V, 50Hz. - 0.85HP. - Template reflected characters - Template direct reading - 5 belts 770x4mm. - 5 belts 2700x3mm. 	Each	1:16			√
19.	Injection moulding machine	<ul style="list-style-type: none"> - 500WHB - Heater barrel 300WHB 	Each	1:16		√	√
20.	Gas welding plant with accessories	<ul style="list-style-type: none"> - Welding and cutting torch 	Set	1:16		√	√
21.	Forge fire	<ul style="list-style-type: none"> - 700x500mm size of heath. - 800mm height. - Power rating motor 370W - Weight 80kg. 	Each	1:16		√	√
22.	Fume extraction unit	<ul style="list-style-type: none"> - Smoke heater connection - Ø150mm. - 2 m length. 	Each	1:8		√	√
23.	Angle grinder	<ul style="list-style-type: none"> - Single phase - Power range 900W-2400W respectively. 	Each	1:8	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
24.	Portable power drill with accessories	- Drill capacity Ø (0-16)mm. - Power rating 750W.	Each	1:8	√	√	√
25.	Workshop bench	Dimensions: Length: 2000mm. Height: 800mm. Width: 820mm.	Each	1:2	√	√	√
26.	Gas welding bench including fire bricks	Dimensions: Length: 1200mm. Height: 800mm. Width: 700mm.	Each	1:4	√	√	√
27.	Arc welding bench	Dimensions: Length: 1000mm. Height: 500mm. Width: 700mm.	Each	1:8	√	√	√
28.	Arc welding machine	- 250A/60% Duty cycle. - Power source: 3Phase 380V AC 50Hz	Each	1:16	√	√	√
29.	Steel cabinet	Dimensions: Length: 1500mm. Height: 2100mm. Width: 530mm.	Each	1:8	√	√	√
30.	Tool cabinet with drawers	Dimensions: Height 1055mm. Width 835mm. Depth 780mm.	Each	1:8	√	√	√
31.	Surface plate	- 1000x800mm.	Each	1:16	√	√	√
32.	Vee block with clamps	- Size 50x40x40mm.	Each	1:8	√	√	√
33.	Classroom chair	- 450x420x400mm.	Each	1:1	√	√	√
34.	Office Chair	- 450x420x400mm.	Each	1:1	√	√	√
35.	Office table	- 1500x700x720mm. - With cabinet and drawers	Each	1:1	√	√	√
36.	Classroom table	Dimensions: Length: 1200mm. Height: 700mm. Width: 720mm.	Each	1:2	√	√	√
37.	Bench vice	- Forged steel - 150mm width opening.	Each	1:2	√	√	√
38.	Low loading trolley	- 1500kg capacity - Size 1500x750x500mm.	Each	1:16	√	√	√
39.	Four jaw chuck	- Ø200mm. - Hole Ø55mm.	Each	1:4	√	√	√
40.	Revolving centres	- Morse Taper 2, 3 and 4	Each	1:4	√	√	√
41.	Fixed centre (Dead)	- MT 2, MT 3, MT 4	Each	1:4	√	√	√
42.	Magnetic table for surface grinding machine	- 178mm length. - 103mm width - 43mm total height.	Each	1:16	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
43.	Rotary feed and milling table	<ul style="list-style-type: none"> - Table Ø205mm. - 205x175mm size clamp plate. - 12mm width T-slots. - 132mm overall height. 	Each	1:16		√	√
44.	Cylindrical grinding with accessories	<ul style="list-style-type: none"> - Rotary motor - Tail stock - Dead Centre MT2-4 - Half centre MT2-4 - Wheel dresser 	Each			√	√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Centering device	Straight shank 8mm.	Each	1:16	√	√	√
2.	Clamping bolts	M6/M8x50,70,90,120, 150mm.	Set	1:2	√	√	√
3.	Clamps	Parallel - 14x100x6/8mm. - 40x20x6/8mm.	Set	1:2	√	√	√
		Parallel jaw - Spass size 600mm. - Gap depth 180mm.	Each	1:2	√	√	√
		Drop forged-round shank - 14x160x6/8mm. - 40x25x6/8mm.	Set	1:2	√	√	√
		U-Beveled - 14x125x6/8mm. - 38x25x6/8mm.	Set	1:2	√	√	√
		Goose necked - 14x125x6/8mm. - 40x20/40x6/8mm.	Set	1:2	√	√	√
4.	Drift punch	For Morse Taper (MT) - MT1-2=140mm length. - MT3=190mm length.	Set	1:8	√	√	√
		Morse taper shank - 133mm length.	Each	1:4	√	√	√
5.	Drill chuck quick action	- Capacity (0-16)mm. - External Ø51mm. - Mounting hole Ø6mm.	Each	1:4	√	√	√
6.	Twist drill	Straight shank - Ø(1-13)mm (range 0.5mm)	Set	1:2	√	√	√
		Taper shank - Ø(14-30)mm	Set	1:8	√	√	√
		Drill bit HSS - (1-12)mm (0.1mm range)	Box	1:8	√	√	√
		Centre drill: Ø2.5-5mm.	Set	1:4	√	√	√
7.	Hacksaw frame	280mm or 300mm. Length	Each	1:1	√	√	√
8.	HSS tool bit	10x10x100mm.	Each	1:4	√	√	√
		12x12x125mm.	Each	1:4	√	√	√
		16x16x150mm.	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
9.	Tool holders	<ul style="list-style-type: none"> - HSS bits 10x10x100mm. - R.H. length 130mm. Width 25 and height 28mm. - HSS bit 12x12x100mm - R.H. length 145mm, Width 22mm, Height 32mm - Parting off tool holder for parting tool 20x3x100mm. - Length 120mm, Width 12mm, Height 73mm - Parting off tool holder to suit parting off tool 20x3x150mm. - Length 135mm, Width 19mm, Height 22.5mm 	Each	1:4	√	√	√
10.	Carbide tipped milling cutters (face mill)	<ul style="list-style-type: none"> - Ø63mm. with 6 teeth - Ø100mm, with 8 teeth 	Each	1:4		√	√
11.	Corner cutter	Ø50mm. No of bits 3 teeth	Each	1:4		√	√
12.	End mill	Straight shank <ul style="list-style-type: none"> - Ø(3-16)mm. 	Each	1:2		√	√
13.	Tungsten carbide	Tips triangular <ul style="list-style-type: none"> - TPGN L=11mm. - R=0.8mm. Square: SPU-525m, L-19.05mm, R-O.8mm.	Pack	1:2		√	√
14.	Carbide tool holder	Turning Length 125mm, Width 25mm, Height 25mm	Each	1:4		√	√
15.	Drill sleeves	Morse Taper 2, MT3, MT4, MT6	Each	1:8	√	√	√
		MT8, MT13	Each	1:8	√	√	√
16.	Files	Hand Bastard cut - 10"length	Each	1:2	√	√	√
		Second cut: 10" length	Each	1:2	√	√	√
		Machinist second cut 12" length	Each	1:2	√	√	√
		Needle: set of 6	Each	1:2	√	√	√
17.	Hammers	Ball pein: Weight 320g, 550g, 800g	Each	1:1	√	√	√
		Soft: Face Ø32mm.	Each	1:1	√	√	√
		Cross pein: Weight 320g	Each	1:2	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Cross pein: Weight 550g	Each	1:2	√	√	√
		Sledge: Weight 30kg.	Each	1:2	√	√	√
18.	Centre punch	Set of 6	Set	1:4	√	√	√
19.	Vices	Steel forged - 150mm jaw width - 200mm jaw opening. - 100mm jaw depth	Each	1:2	√	√	√
		Hand - 50mm opening jaw. - 32 mm jaw size. - 160 mm length.	Each	1:2	√	√	√
		Pipe: Maxi. pipe Ø 4"	Each	1:4	√	√	√
20.	Allen keys	Set of 0.5mm range (2.5–10)mm.	Set	1:4	√	√	√
21.	Spanners	Adjustable - 100x13mm.	Each	1:8	√	√	√
		- 205x26mm.	Each	1:8	√	√	√
		- 380mm.	Each	1:4	√	√	√
		Pipe wrench - Maxi. pipe Ø3½" - 110mm jaw opening. - 720mm length.	Each	1:4			
		Combination - Set of 12 - Size (8-19)mm	Set	1:4	√	√	√
		Open ended - (6x7)mm(27x32)mm (set of 12pcs)			√	√	√
22.	Pliers	Combination - 200mm length - Plastic handle	Each	1:2	√	√	√
		Long nose - 200mm length. - 73mm length of jaw.	Each	1:4	√	√	√
		Adjustable (BAHCO) - Max. Ø2½"	Each	1:8	√	√	√
		Gas - 250mm length - 4mm jaw width	Each	1:4	√	√	√
		Grip: 250mm length. - 30mm jaw	Each	1:4	√	√	√
		Internal circlip - 140mm length. - (8 –25)mm circlip size.	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		External circlip - (20 -25)mm size. - 140mm length	Each	1:4	√	√	√
23.	Punches	Letters: 6mm height.	Each	1:4	√	√	√
		Number: 0-9.	Each	1:4	√	√	√
		Wad: With handle tapered cutting head. - Ø(0-13) (Standard pack 12)	Set	1:8	√	√	√
24.	Fire extinguisher	Co ² type, capacity 25 Kg	Each	1:8	√	√	√
		Foam (dry powder)	Each	1:16	√	√	√
25.	Grease gun	Reservoir - Dimension 70mmx300mm - Capacity 66cm ³ .	Each	1:8	√	√	√
26.	Screw extractor	Size diameter (2–12)mm.	Set	1:4	√	√	√
27.	Scribers	Bent type 200mm (one end) Assorted type	Each	1:1	√	√	√
28.	Cold chisel	Assorted type	Set	1:1	√	√	√
29.	Engineering try square	300mm.	Each	1:1	√	√	√
		500mm.	Each	1:8	√	√	√
30.	Counter Sink bit	Diameter 16mmx10x 90°/60°	Each	1:8	√	√	√
31.	Tin man's snips	Left hand (LH) Right hand (RH)	Set	1:4	√	√	√
32.	Pop riveting gun self adjusting	With adaptors for rivets 3.2mm, 4.0mm, 4.8mm.	Each	1:8	√	√	√
33.	Soldering iron	Mini. 26mm, 500g.	Each	1:4	√	√	√
34.	Electric soldering gun	- 750W ,76 tips. - Diameter 7mm.	Each	1:4	√	√	√
35.	Tong	Forged type assorted	Each	1:4		√	√
36.	Spark lighter	Frint type	Each	1:4	√	√	√
37.	Wire brush	40x250mm.	Each	1:1	√	√	√
38.	Screw driver	- Philips/star head. Assorted	Each	1:4	√	√	√
39.	Oil (gun) can	Capacity: 0.5liters Spout length 125mm	Each	1:4	√	√	√
40.	Metric threading	Taps and dies sets - Assorted with tap wrenches. - Sizes M5-M24. - Sizes 3/10" -1" in UNC wooden box Combination(set) - 30x300x2mm blade length.	Set	1:8	√	√	√
41.	Extension cable	- 40m. - Diameter 2.5mm.	Each	1:8	√	√	√
42.	Gas welding hosepipe	- Twin hose pipe 12m	Each	1:8	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- Diameter $\frac{3}{8}$ ".					
43.	Protractors universal	Protector disc shape 0-180°	Each	1:4	√	√	√
		Universal vernier protractor - 300mm length of blade	Each	1:8	√	√	√
44.	Scribing block	Spindle height 300mm	Each	1:4	√	√	√
45.	Gauges	Dial - Range measurement 0.8mm. - Division 0.02+/- mm. - Graduations 0-40-0 - Diameter O.D 32	Each	1:4		√	√
		Magnetic base - Max. height 250mm adjustable. - Base block 45x55x65mm. - Magnetic force 75kg	Each	1:4		√	√
		Bore: Measuring range 50-150mm.	Each	1:8		√	√
		Telescopic - Range of measurement 12.5-150mm.	Each	1:8	√	√	√
		Grinding: - Cutting angle 118° - Angle graduation (3-150)°	Each	1:8	√	√	√
			Each	1:8	√	√	√
		Centre: Thread angle 60° - Thread system (Metric, UNC)	Each	1:4	√	√	√
		Tool - Thread angle sharp V thread 30° acute thread - Pitch (2-12)mm.	Each	1:4	√	√	√
		Screw pitch - Thread angle 60° metric - Thread angle 60 UNC/NNF - Thread angle: 55°BSW	Each	1:4	√	√	√
			Each	1:4	√	√	√
Each	1:4		√	√	√		
46.	Micrometers	Outside - 0-25mm, 25-50mm, 50-75mm, 75-100mm.	Each	1:8		√	√
		Inside: Range (25-100)mm.	Each	1:8		√	√
		Depth - Measuring depth 0-150mm (25mm range) No. of interchangeable rods 6	Each	1:16	√	√	√
47.	Tape measure	Pull and push (3-5)m length	Set	1:1	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
48.	Engineers steel rule	Metric/imperial graduated 300mm.	Each	1:1	√	√	√
49.	Vernier Callipers	Vernier Metric/imperial graduated - 150mm length - 40mm jaw length.	Each	1:1	√	√	√
		Vernier metric/imperial graduated - 300mm length.	Each	1:8	√	√	√
		Outside (spring) - 200mm length.	Each	1:4	√	√	√
		Inside (spring) - 200mm length.	Each	1:4	√	√	√
		Divider (spring) - (150- 200)mm length.	Each	1:4	√	√	√
50.	Anvil	Drop forged with double Bick - 50kg weight. - 570mm length. - 100mm width. - 220mm height.	Each	1:16	√	√	√
51.	Set of drifts in metal case (cylinders)	- No. of punches 6 - Diameter of points 3mm, 4mm, 5mm, 6mm, 7mm, 8mm. - 150mm length.	Set	1:8	√	√	√
52.	Beam trammel	(0-600)mm.	Each	1:8	√	√	√
53.	Waste bin	Capacity 120 litres	Each	1:4	√	√	√
54.	Engineers spirit levels	- 310mm length. - 0.030mm scale value of longitudinal bubble.	Each	1:8	√	√	√
55.	Machine reamer	HSS/Conical 14mm, 16mm, 18mm, 20mm, 24mm, 25mm, 30mm.	Each	1:8	√	√	√
		HSS Cylindrical Ø3mm, Ø5mm, Ø6mm, Ø8mm, Ø10mm, Ø12mm.		1:4			
56.	Safety gear	Goggles - Type SR57" adjustable. - Rubber head band.	Pair	1:1	√	√	√
		Ear muffs: $\frac{3}{8}$ universal	Each	1:1	√	√	√
		Apron: Leather	Each	1:1	√	√	√

BASIC TOOLS AND EQUIPMENT FOR WELDING AND FABRICATION (FOR 16 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Pillar drilling machine with all accessories	- Max. drill size \varnothing 31mm. - MT3 spindle internal taper. - Max. quill movement 115mm. - 380V, 3Phase, - 50 Hz-740W	Each	1:16	√	√	√
2.	Bench drilling machine (pillar type) complete with all accessories	- Max. drill size \varnothing 25mm. - MT3 spindle internal taper - Power supply:380V, 50Hz - Power rating: 740W - Max. quill movement 115mm.	Each	1:16	√	√	√
3.	Portable power drill machine complete with all accessories	- Drilling capacity \varnothing (0-16)mm. - Power rating 1800r.p.m.	Each	1:8	√	√	√
4.	Bending / folding machine (manual)	- Working length 1500mm. - Max. sheet thickness 1.5mm.	Each	1:16	√	√	√
5.	Universal combination shear machine with all accessories	- Max. cut thickness 8mm. - Blade 300mm. length - Cut round bar \varnothing 28mm. - Cut angle iron 75x75x8mm.	Each	1:16	√	√	√
6.	Hand –operated shear machine (guillotine).	- Table size. 980x820x630mm. - Max. thickness = 1.5 mm	Each	1:16	√	√	√
7.	Motor driven Power shear machine (guillotine)	- Maxi. cut plate thickness 3mm. - Working length 2060mm. - 4kW/5.5HP	Each	1:16		√	√
8.	Bench grinding machine	- Grinding wheel size 200x32x20mm. - With eye shields - Motor 380V, - 3000 r.p.m.	Each	1:16	√	√	√
9.	Pedestal grinder machine	- Grinding wheel size 300x52x32mm. - With eye shields and wheel dresser (Heavy duty) - Motor power 1.6kW/2.2HP - 2800r.p.m	Each	1:16	√	√	√
10.	Spot welding machine.	- Manual operated type. - 10kVA. - Arm length 300mm - Max. materials thickness 2mm.	Each	1:16		√	√
11.	Flaring and beading	- Max. thickness 1mm.	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
	machine with accessories.	- Working height 250mm. - Working depth 200mm. - Distance shaft centres 50mm.					
12.	Rolling machine.	- Working length 1025mm. - Sheet thickness 3.5mm. - Upper roller Ø90mm. - Lower roller Ø80mm.	Each	1:16	√	√	√
13.	Power rolling machine	- Working length 1025mm. - Sheet thickness 3.5mm. - Upper roller Ø90mm. - Lower roller Ø80mm. - Motor power: 0.7kW or 1HP	Each	1:16		√	√
14.	Metal bending machine with its formers	- Maxi. flat 15mm. - Maxi. round Ø30mm. - Maxi. angle 90°	Each	1:16	√	√	√
15.	Hydraulic folding machine	- Sheet thickness (0-2)mm - Flange height: (2-25)mm - Motor power 330W /220V	Each	1:16		√	√
16.	Hydraulic pipe bending machine complete with bending former set	- Tube inside, Ø(10-32)mm. - Max. pressure 80kN/m ² .	Each	1:8		√	√
17.	A.C welding machine (Transformer)	- Current: 250Amps, - 60% duty cycle. - 3Phase.	Each	1:8	√	√	√
18.	D.C rectifier welding machine	- Current: 250Amps. - 3Phase.	Each	1:8	√	√	√
19.	Portable welding machine (D.C/A.C)	- Voltage: 240V - Current: 150 Amps.	Each	1:8	√	√	√
20.	AC/DC TIG welding machine with complete accessories.	- Current: 250 Amps. - 3Phase.	Each	1:16		√	√
21.	MIG/MAG welding machine with accessories.	- Current: 240 Amps, - 3Phase.	Each	1:16		√	√
22.	Power hacksaw machine with material stand.	Blade size 350x38x3mm. Motor power rating 1.1kW.	Each	1:16	√	√	√
23.	Heat treatment furnace	- Max. Temperature 1110° C. - Power rating:1200W.	Each	1:16		√	√
24.	Hydraulic press (Manual)	Max. 12tons, Stroke 110mm.	Each	1:16		√	√
25.	Angle grinding machine	- Motor power rating 1900W. - Disc Size Ø180mm. - Speed (3000 – 4000)r.p.m.	Each	1:8	√	√	√
26.	Profile gas cutting machine with	Cutting thickness (3 – 60)mm.	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
	accessories.						
27.	Oxy-Acetylene plant with complete accessories	I.S.O cylinder equipment.	Set	1:4	√	√	√
28.	Workshop bench with metal top.	Dimensions: Length: 2000mm. Height 800mm. Width: 820mm. - With drawer.	Each	1:2	√	√	√
29.	Welding bench(ARC)	Dimensions: Length: 1000mm. Height: 700mm. Width: 500mm.	Each	1:4	√	√	√
30.	Gas welding bench	- Length 1200xHeight 800x Width 700mm. - Overlaid fire bricks Water container.	Each	1:4	√	√	√
31.	Steel cabinet	Dimensions: Length: 1500mm Height 2100mm Width: 530mm.	Each	1:4	√	√	√
32.	Tool cabinet with drawers	Dimensions: Length: 835mm Height 1055mm Width: 780 mm.	Each	1:4	√	√	√
33.	Surface plate(table)	1000x1000mm.	Each	1:16	√	√	√
34.	Classroom chair	450x420x400mm.	Each	1:1	√	√	√
35.	Office chair	450x420x400mm.	Each	1:1	√	√	√
36.	Office table with cabinet and drawers	Dimensions: Length: 1500mm. Height: 700mm. Width: 720mm.	Each	1:2	√	√	√
37.	Classroom table	Dimensions: Length: 1200mm Height 700mm Width: 720mm.	Each	1:2	√		
38.	Anvil	Dropped forged with double bick Weight: 50kg.	Each	1:8	√	√	√
39.	Low loading trolley	Carrying capacity:1500kg Dimensions: 1500x750x500mm.	Each	1:16	√	√	√
40.	Workshop stools	450mm. height	Each	1:1	√	√	√
41.	Bench vice	Forged steel 150mm width opening.	Each	1:2	√	√	√
42.	Hydraulic tensile, strength testing machine	(10kN	Each	1:16		√	√
43.	Impact testing machine	N/mm ² (10kN)	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
44.	Forge fire equipped with motor	<ul style="list-style-type: none"> - Size of heath 700x 500mm. - Height: 800mm. - Power rating: 370W. - Weight: 80kg. 	Each	1:16		√	√
45.	Pullers	Three legged. <ul style="list-style-type: none"> - Max. Spread 250mm. - Max. Reach 200mm. - Weight: 4.2kg. 	Each	1:8		√	√
		Twin legged <ul style="list-style-type: none"> - Max. Spread 250mm. - Max. Reach 200mm. - Weight: 3.4kg. 	Each	1:8		√	√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Hacksaw frame	Adjustable/Fixed Length: 300mm.	Each	1:1	√	√	√
2.	Scriber	Bent type (one end) - Range 0-200mm. Length - A-Body: Ø8mm	Each	1:1	√	√	√
3.	Chisels	Cold: Assorted type.	Set	1:4	√	√	√
		Hot: Assorted	Each	1:4		√	√
4.	Tape measure	(3-5) m. long.	Each	1:1	√	√	√
5.	Try square	300mm. Length	Each	1:1	√	√	√
6.	Engineering square	1000mm. Length	Each	1:4	√	√	√
7.	Steel rule	300mm. Length	Each	1:1	√	√	√
		1000m. Length	Each	1:4	√	√	√
8.	Centre punch	Assorted types.	Set	1:4	√	√	√
9.	Drift punch	Assorted types.	Set	1:4		√	√
10.	Files	Assorted types.	Each	1:1	√	√	√
11.	Drill bit	HSS Twist drill Ø(1-13)mm.	Set	1:4	√	√	√
		HSS Twist drill - Ø(13.5-32)mm. - Range 0.5mm.	Set	1:8	√	√	√
12.	Centre drill	Ø(2-4)mm.	Set	1:4	√	√	√
13.	Counter sink bit	- 60°-90° - Ø10mmx16mm.	Each	1:4	√	√	√
14.	Straight edge	Length: 1.5m.	Each	1:8		√	√
15.	Tinmans snips	- Left-hand. - Right hand. - Straight.	Set	1:4	√	√	√
16.	Rivet set	- Doll. - Impact resistance head.	Set	1:4	√	√	√
17.	Guns	Riveting Current: 250Amps, 3Phase.	Each	1:8	√	√	√
		Pop Riveting: Ø(3-6)mm.	Each	1:4	√	√	√
18.	Soldering iron	- Mini. Ø26mm. - Weight:500g.	Each	1:4	√	√	√
19.	Electric soldering iron	Bent type - Power rating 750W.	Each	1:4		√	√
20.	Welding tongs	Forged type.	Each	1:3	√	√	√
21.	Spark lighter	Frint type.	Each	1:4	√	√	√
22.	Brush	Wire: 250mm long	Each	1:1	√	√	√
		File: 4x30x115mm.	Each	1:1	√	√	√
		Soft brush Bristle 60m length	Each	1:1	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
23.	Hammers	Straight pein: Weight: 1kg.	Each	1:2	√	√	√
		Ball pein: Weight: 1Kg	Each	1:2	√	√	√
		Sledge: Weight: 3.kg.	Each	1:8		√	√
		Cross pein: Weight: 800 kg.	Each	1:4	√	√	√
		Chipping: Straight peak. - Weight: 300g.	Each	1:4	√	√	√
		Mallet: Hide headed type. - Weight: 800g.	Each	1:1	√	√	√
		Aluminium: Weight: 1 kg.	Each	1:1	√	√	√
24.	Welding shield	Face shield - Asbestos type.	Each	1:2.	√	√	√
25.	Welding helmet	Head shield: Asbestos type.	Each	1:2	√	√	√
26.	Electrode holder	- Current: 500Amps. - Asbestos type.	Each	1:2	√	√	√
27.	Gas welding toolkit	Combined cutting and welding torch equipment.	Set	1:4	√	√	√
28.	Spring dividers	250mm. Leg length.	Each	1:2	√	√	√
29.	Trammels	Beam: 1000mm length.	Each	1:8		√	√
30.	Vernier Callipers	Outside: 250mm length.	Each	1:2		√	√
		Inside: 250mm length.	Each	1:2		√	√
		Vernier - (0-300)mm length. - Jaw length 80mm.	Each	1:8	√	√	√
		- (0-150)mm length. - Jaw length 40m.	Each	1:1		√	√
	Screw drivers	Flat type - 75mm length of handle. - 0.6x3.5m bit thickness.	Each	1:1	√	√	√
		Phillips/star head - Assorted.	Set	1:2	√	√	√
		Spiral ratchet - 0.7x4.5/1.0x5mm bit thickness.	Set	1:2	√	√	√
31.	Micrometer Screw Gauge	(0-25)mm.	Each	1:4		√	√
32.	Regulators	Oxygen - Maxi. pressure 172 bar.	Each	1.4	√	√	√
		Acetylene - Maxi. pressure 14.5 bar.	Each	1:4	√	√	√
33.	Spraying gun	Reservoir capacity:1ltr.	Each	1:8		√	√
34.	Oil can	Capacity 0.5 litre.	Each	1:2	√	√	√
35.	Metric thread cutting tools (tap and die sets)	Sizes: M5-M24	Set	1:16		√	√
36.	Tap and die set imperial	Sizes 3/16" – 1"(U.N.C)	Set	1:16		√	√
		Sizes 1/4" - 1" (U.N.F)	Set	1:16		√	√
37.	Gas welding hosepipe	Twin hosepipe 12m.each	Meter	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
38.	Extension cable	Ø2.5mmx 40m	Each	1:8	√	√	√
39.	Allen keys	(2.5 -10)mm. A/F	Set	1:4	√	√	√
40.	Tool boxes	440x190x160mm.	Each	1:1	√	√	√
41.	Clamps	Parallel - C and G clamp. - Jaw opening 200mm. - Trout depth 95mm.	Each	1:8	√	√	√
		Parallel jaw - Span size 600mm. - Gap depth 180mm.	Each	1:2	√	√	√
42.	Pipe cutters	- Pipe: Ø ¹ / ₈ "-1 ¹ / ₂ " - Ø2"-3"	Each	1:4	√	√	√
43.	Combination square	300mm blade length.	Each	1:8		√	√
44.	Combination pliers	- 200mm length. - With plastic cover.	Each	1:2	√	√	√
45.	Protractors	Universal - Measuring range:0 ⁰ -360 ⁰ - 1 Long rule 300mmx16mm. - Accurate to within 5 minutes of arc	Each	1:4	√	√	√
46.	Gauges	Vernier height - 500mm scribing length. - 135x105mm base length.	Each	1:4	√	√	√
		Surface - 300mm spindle length. - 80x65mm base length.	Each	1:4	√	√	√
		Marking - Length graduation 0-90mm. - Bar length 200mm.	Each	1:4	√	√	√
47.	Spanners	Adjustable - Jaw opening 44mm. - 380mm length.	Each	1:2	√	√	√
		Open ended - (6x7)mm-(27x32)mm (set of 12 pieces).	Set	1:4	√	√	√
		Combination - A set of 12 pieces. - Size (8-19)mm A/F	Set	1:4	√	√	√
		Pipe wrench Maxi. Pipe Ø3 ¹ / ₂ mm. - Jaw opening 110mm. - Length 720mm.	Each	1:4	√	√	√
48.	Punches	Letter - Height 6mm. - Shank square 10mm	Set	1:4	√	√	√
		Number	Set	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- Figures height 6mm. - Shank square 10mm.					
49.	Pliers	Gas: 250mm length - 4mm Jaw width.	Each	1:4	√	√	√
		Grip: 250mm length. - 30mm Jaw width	Each	1:4	√	√	√
		Internal circlip - 140mm length - (8-25) mm circlip size.	Each	1:4		√	√
		External circlip - 140mm length. - (20-25) mm circlip size.	Each	1:4		√	√
		Long nose: 200mm length.	Each	1:4		√	√
		Adjustable: Maxi. $\varnothing 2\frac{1}{2}$ " opening	Each	1:8	√	√	√
		Combination Length 200mm with Plastic cover	Each	1:2	√	√	√
50.	Vices	Hand: 50mm jaw opening. - 32mm jaw size. - 160mm length.	Each	1:1	√	√	√
		Pipe: Max. Gripping pipe $\varnothing 4$ ".	Each	1:4	√	√	√
51.	Diagonal cutting nippers	160mm length.	Each	1:4	√	√	√
52.	Fire extinguisher	- CO ₂ type, 25kg.	Each	1:16	√	√	√
		- Powder type, 25kg.	Each	1:16	√	√	√
53.	Grease gun	Reservoir dimension 70x30mm. Reservoir capacity 66cm ³ .	Each	1:8	√	√	√
54.	Screw extractor	Size $\varnothing(2-12)$ mm.	Set	1:4		√	√
55.	Fume extraction unit	Smoke extractor connection $\varnothing 150$ mmx2000mm.	Each	1:4		√	√
		Extractor fan (Flexible type hose) - Capacity m ³ /hr 1300m ³ - Intake $\varnothing 150$ mm. - Outlet $\varnothing 110$ mm. - Motor power rating 370W	Each	1:4		√	√
56.	Needle file	Assorted	Set	1:4		√	√
57.	Safety gears	Welding goggles Tinted welding glass.	Each	1:1	√	√	√
		Tinted with clear glass.	Each	1:1	√	√	√
		Ear muffs, Universal.	Each	1:1	√	√	√
		Leather gloves, Split leather fiber fingers with cuff.	Pair	1:1	√	√	√

