

# ELECTRO MECHANICAL TECHNOLOGY

**Competency Standards**

National Vocational  
Certificate Level 2

Version 1 - December 2014

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## Competency Standards: Electro Machine Technician (Assistant) - Level 2

### Competency Standard A: Maintain workplace safety

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Follow safe work procedures; apply tools and equipment safety measures; and follow workplace emergency procedures.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>A1:</b> <b>Follow safe work procedures</b>	<b>P1-</b> Organise and arrange duties, tools, equipment materials and work area <b>P2-</b> Use and store PPE <b>P3-</b> Perform tasks in a safe manner	<b>K1-</b> Company safety SOP/policy; Housekeeping practices; Factors that may influence safety at the workplace, such as anger and stress <b>K2-</b> Types of personal protective equipment <b>K3-</b> Safety signs and symbols; Isolation and lockout procedures
<b>A2:</b> <b>Apply tools &amp; equipment safety measures</b>	<b>P1-</b> Check earthing for safety of equipment <b>P2-</b> Store tooling and equipment securely	<b>K1-</b> Method of earthing and its effects on safety <b>K2-</b> Storage and stacking methods of tools & equipment
<b>A3:</b> <b>Follow workplace emergency procedures</b>	<b>P1-</b> Follow safe workplace procedures for dealing with accidents, fires and emergencies within scope of responsibility	<b>K-</b> Scope of responsibility; First aid procedures; Fire safety and fire fighting procedures; Risk control measures

**Competency Standard B:    Apply continuing professional development**

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Identify professional development needs; develop professional knowledge, skills and attitudes, and maintain professional proficiency.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>B1:</b> <b>Identify professional development needs</b>	<b>P1-</b> Discuss professional development needs <b>P2-</b> Identify professional development programmes	<b>K1-</b> Reasons for professional development <b>K2-</b> Access to programmes; Career guidance
<b>B2-</b> <b>Develop professional knowledge, skills and attitudes</b>	<b>P1-</b> Participate in training programmes <b>P2-</b> Document training outcome	<b>K1-</b> Outcomes and relevance of training <b>K2-</b> Report and portfolio writing
<b>B3-</b> <b>Maintain professional proficiency</b>	<b>P1-</b> Identify and use self-study sources <b>P2-</b> Implement self-study plan	<b>K1-</b> Research methods; Access to sources <b>K2-</b> Planning your career

## Competency Standard C: Perform preventive maintenance as part of electrical operations

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Plan and prepare for preventive maintenance; perform routine inspections; carry out preventive maintenance; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>C1:</b> <b>Plan and prepare for preventive maintenance</b>	<b>P1-</b> Identify and obtain safety and other regulatory requirements for maintenance <b>P2-</b> Interpret circuit diagrams <b>P3-</b> Identify and select tools and equipment	<b>K1-</b> Safety requirements; Specifications; Hazard identification <b>K2-</b> Drawings and symbols specifications <b>K3-</b> Tools and equipment and calibration thereof
<b>C2:</b> <b>Perform routine Inspection</b>	<b>P1-</b> Check for safety hazards <b>P2-</b> Carry out procedures for routine checks <b>P3-</b> Document results	<b>K1-</b> Inspection requirements <b>K2-</b> Maintenance of electrical instruments and equipment <b>K3-</b> Types of common faults of wiring; Load balance; Safety precautions <b>K4-</b> Test and preventive reports
<b>C3:</b> <b>Carry out preventive maintenance</b>	<b>P1-</b> Perform basic measurements tests <b>P2-</b> Perform minor adjustments and calibrations <b>P3-</b> Replace worn out or damaged parts	<b>K1-</b> Measurement and calculation of electrical parameters <b>K2-</b> Basic operation of appliance and settings to adjust performance <b>K3-</b> Communication skills
<b>C4:</b> <b>Complete work</b>	<b>P1-</b> Complete work related documents and procedures <b>P2-</b> Perform final quality inspection <b>P3-</b> Clean up and store tools, equipment and materials	<b>K1-</b> Importance of documentation; Customer care procedures and techniques <b>K2-</b> Importance of quality; handing over to client <b>K3-</b> Waste disposal procedures; Care of tools and equipment

## Competency Standard D: Perform corrective maintenance as part of electrical operations

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Plan and prepare for corrective maintenance; perform troubleshooting; carry out corrective maintenance procedures; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>D1:</b> <b>Plan and prepare for corrective maintenance</b>	<b>P1-</b> Identify and obtain safety and other regulatory requirements for maintenance <b>P2-</b> Interpret circuit diagrams <b>P3-</b> Identify and select tools and equipment	<b>K1-</b> Safety requirements; Specifications; Hazard identification <b>K2-</b> Drawings and symbols specifications <b>K3-</b> Tools and equipment and calibration thereof
<b>D2:</b> <b>Perform troubleshooting</b>	<b>P1-</b> Check for safety hazards <b>P2-</b> Carry out diagnostic procedures <b>P3-</b> Identify faulty parts and/or equipment <b>P4-</b> Analyse system fault	<b>K1-</b> Troubleshooting requirements <b>K2-</b> Identification of electrical faults by checking shape, size and colour of components and parts; Measurement of electrical parameters; Safety precautions <b>K3-</b> Methods of fault identification in electrical components <b>K4-</b> System operations in an electrical environment
<b>D3:</b> <b>Carry out corrective maintenance procedures</b>	<b>P1-</b> Dismantle faulty parts or components <b>P2-</b> Replace or repair faulty parts or components <b>P3-</b> Perform commissioning	<b>K1-</b> Dismantling procedures <b>K2-</b> Replacing and repairing procedures <b>K3-</b> Electrical load management; commissioning procedures
<b>D4:</b> <b>Complete work</b>	<b>P1-</b> Complete work related documents and procedures <b>P2-</b> Perform final quality inspection <b>P3-</b> Clean up and store tools, equipment and materials	<b>K1-</b> Importance of documentation; Customer care procedures and techniques <b>K2-</b> Importance of quality; handing over to client <b>K3-</b> Waste disposal procedures; Care of tools and equipment



## Competency Standard E: Test electrical and electronic parameters

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Perform testing; diagnose faults; and remove faults.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>E1:</b> <b>Perform Testing</b>	<b>P1-</b> Conduct visual inspection <b>P2-</b> Implement testing procedures	<b>K1-</b> Damage identification in terms of cracks, disorder in shape and structure, broken parts <b>K2-</b> Process of different tests; Electrical parameters
<b>E2:</b> <b>Diagnose fault</b>	<b>P1-</b> Interpret test results <b>P2-</b> Implement troubleshooting procedures and identify fault	<b>K1-</b> Interpretation of drawings and circuit diagrams <b>K2-</b> Troubleshooting procedures; Electrical and electronic parameters
<b>E3:</b> <b>Remove faults</b>	<b>P1-</b> Repair or replace component parts <b>P2-</b> Carry out operational testing	<b>K1-</b> Interpretation of drawings and circuit diagrams; product knowledge <b>K2-</b> Product knowledge; Testing procedures and equipment

## Competency Standard F: Assemble electrical machines

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Plan and prepare for assembling; assemble machine and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>F1:</b> <b>Plan and prepare for assembling</b>	<b>P1-</b> Identify and obtain safety and other regulatory requirements for assembling <b>P2-</b> Prepare tools and equipment	<b>K1-</b> Safety requirements; Specifications; hazard identification <b>K2-</b> Types of tools, equipment and material
<b>F2:</b> <b>Assemble machine</b>	<b>P1-</b> Confirm assembling specifications <b>P2-</b> Assemble and connect electrical circuit with ports <b>P3-</b> Joint cables and connections <b>P4-</b> Confirm assembling	<b>K1-</b> Assembling requirements <b>K2-</b> Concept of neutral, phase and earth; Input and Output Safety precautions <b>K3-</b> Types and application of different jointing methods - tin (solder), crimped terminals - ferrules and shrinking nut - bolt & screw terminal <b>K4-</b> Supervisor and/or client communication
<b>F3:</b> <b>Complete work</b>	<b>P1-</b> Complete work related documents and procedures <b>P2-</b> Perform final quality inspection <b>P3-</b> Clean up and store tools, equipment and materials	<b>K1-</b> Importance of documentation; customer care procedures and techniques <b>K2-</b> Importance of quality; handing over to client <b>K3-</b> Waste disposal procedures; care of tools and equipment

## Competency Standard G: Use and maintain electrical tools and equipment

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Use electrical tools and equipment; maintain electrical tools, equipment and instruments; maintain batteries; and calibrate measuring equipment.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>G1:</b> <b>Use electrical tools and equipment</b>	<b>P1-</b> Identify and select tools, equipment and instruments <b>P2-</b> Demonstrate safe use of tools, equipment and instruments	<b>K1-</b> Purpose of electrical tools, equipment and instruments <b>K2-</b> Use of electrical tools, equipment and instruments
<b>G2:</b> <b>Maintain electrical tools, equipment and instruments</b>	<b>P1-</b> Describe preventive maintenance procedures <b>P2-</b> Maintain and/or replace tool insulation <b>P3-</b> Clean and store electrical tools, equipment and instruments	<b>K1-</b> Preventive maintenance; Types of maintenance schedules or programmes for: - Tools - Equipment - Instruments - Machinery - Facilities <b>K2-</b> Types of insulation and reports <b>K3-</b> Storage requirements
<b>G3:</b> <b>Maintain batteries</b>	<b>P1-</b> Determine state of charge <b>P2-</b> Maintain electrolyte level <b>P3-</b> Charge batteries	<b>K1-</b> Types of batteries <b>K2-</b> Role of electrolyte <b>K3-</b> Charging procedures
<b>G4:</b> <b>Calibrate measuring instruments</b>	<b>P1-</b> Check calibration of measuring instruments <b>P2-</b> Document and interpret calibration procedure <b>P3-</b> Calibrate measuring instrument	<b>K1-</b> Types and methods of calibration <b>K2-</b> Types of calibration reports <b>K3-</b> Types and methods of calibration

## Competency Standard H: Test electrical machines

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Perform testing; diagnose faults; and remove faults.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>H1:</b> <b>Perform testing</b>	<b>P1-</b> Conduct visual inspection <b>P2-</b> Implement testing procedures	<b>K1-</b> Damage identification in terms of cracks, disorder in shape and structure, broken parts <b>K2-</b> Process of different tests; Electrical parameters
<b>H2:</b> <b>Diagnose faults</b>	<b>P1-</b> Interpret test results <b>P2-</b> Implement troubleshooting procedures and identify fault	<b>K1-</b> Interpretation of drawings and circuit diagrams <b>K2-</b> Troubleshooting procedures; Electrical and electronic parameters
<b>H3:</b> <b>Remove faults</b>	<b>P1-</b> Repair or replace component parts <b>P2-</b> Carry out operational testing	<b>K1-</b> Interpretation of drawings and circuit diagrams; product knowledge <b>K2-</b> Product knowledge; Testing procedures and equipment

## Competency Standard I: Rewind machines

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Plan and prepare for installation; perform machine installation; carry out operational testing; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>I1:</b> <b>Plan and prepare for rewinding</b>	<b>P1-</b> Identify and obtain safety and other regulatory requirements for rewinding <b>P2-</b> Arrange tools and equipment	<b>K1-</b> Safety requirements; Specifications; Hazard identification <b>K2-</b> Tools and equipment requirements
<b>I2:</b> <b>Perform troubleshooting</b>	<b>P1-</b> Interpret and confirm rewinding specifications <b>P2-</b> Carry out testing procedures <b>P3-</b> Determine fault <b>P4-</b> Document and report results	<b>K1-</b> Rewinding requirements <b>K2-</b> Testing procedures <b>K3-</b> Fault identification; Analysis of test results <b>K4-</b> Supervisor and/or client communication
<b>I3:</b> <b>Perform rewinding operations</b>	<b>P1-</b> Remove and replace faulty winding <b>P2-</b> Rewind machine <b>P3-</b> Perform winding tests	<b>K1-</b> Replacement procedures <b>K2-</b> Rewinding procedures <b>K3-</b> Types of winding tests
<b>I4:</b> <b>Complete work</b>	<b>P1-</b> Complete work related documents and procedures <b>P2-</b> Perform final quality inspection <b>P3-</b> Clean up and store tools, equipment and materials	<b>K1-</b> Importance of documentation; customer care procedures and techniques <b>K2-</b> Importance of quality; handing over to client <b>K3-</b> Waste disposal procedures; care of tools and equipment

## Competency Standard J: Install electrical machines

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Plan and prepare for installation; perform machine installation; carry out operational testing; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>J1:</b> <b>Plan and prepare for installation</b>	<b>P1-</b> Identify and obtain safety and other regulatory requirements for installation <b>P2-</b> Review layout plan and confirm location for installation <b>P3-</b> Arrange tools and equipment <b>P4-</b> Acquire work	<b>K1-</b> Safety requirements; Specifications; Hazard identification <b>K2-</b> Importance of correct position and location – consequences of wrong position and location; Physical structure <b>K3-</b> Tools and equipment requirements <b>K4-</b> Purpose of work permit
<b>J2:</b> <b>Perform machine installation</b>	<b>P1-</b> Interpret and confirm installation specifications <b>P2-</b> Perform installation <b>P3-</b> Perform pre-commissioning Test <b>P4-</b> Confirm installation	<b>K1-</b> Installation requirements <b>K2-</b> Installation requirements <b>K3-</b> Pre-commissioning procedures <b>K4-</b> Supervisor and/or client communication
<b>J3:</b> <b>Carry out operational testing</b>	<b>P1-</b> Test and adjust component and/or parts <b>P2-</b> Commission machine <b>P3-</b> Perform permit closing	<b>K1-</b> Functional tests and adjustments <b>K2-</b> Basic operation of machine and settings to adjust performance <b>K3-</b> Safety procedures
<b>J4:</b> <b>Complete work</b>	<b>P1-</b> Complete work related documents and procedures <b>P2-</b> Perform final quality inspection <b>P3-</b> Clean up and store tools, equipment and materials	<b>K1-</b> Importance of documentation; customer care procedures and techniques <b>K2-</b> Importance of quality; handing over to client <b>K3-</b> Waste disposal procedures; care of tools and equipment

## Competency Standard K: Perform installation of electrical machines

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Plan and prepare for installation; install electrical machine; carry out operational checks; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>K1:</b> <b>Plan and prepare for installation</b>	<b>P1-</b> Identify and obtain safety and other regulatory requirements for installation <b>P2-</b> Select and termination electrical cables <b>P3-</b> Arrange earthing	<b>K1-</b> Safety requirements; Specifications; hazard identification <b>K2-</b> Types and size of cables; mounting of cables; tools for cable works <b>K3-</b> Earthing requirements
<b>K2:</b> <b>Install electrical machine</b>	<b>P1-</b> Confirm installation specification <b>P2-</b> Position and configure machine <b>P3-</b> Joint cables and connections <b>P4-</b> Confirm installation	<b>K1-</b> Installation requirements <b>K2-</b> Importance of correct position and location; Safety precautions <b>K3-</b> Types and application of different jointing methods <ul style="list-style-type: none"> <li>- tin</li> <li>- crimped lug, cable shoes, eyelets and tunnel terminals</li> <li>- ferrules and shrinking nut</li> <li>- bolt &amp; screw terminal</li> </ul> <b>K4-</b> Supervisor and/or client communication
<b>K3:</b> <b>Carry out operational testing</b>	<b>P1-</b> Test and adjust component and/or parts <b>P2-</b> Confirm operation of electrical machine <b>P3-</b> Explain operation of machine to customer	<b>K1-</b> Functional tests and adjustments <b>K2-</b> Machine features <b>K3-</b> Communication skills
<b>K4:</b> <b>Complete work</b>	<b>P1-</b> Complete work related documents and procedures <b>P2-</b> Perform final quality inspection <b>P3-</b> Clean up and store tools, equipment and materials	<b>K1-</b> Importance of documentation; Customer care procedures and techniques <b>K2-</b> Importance of quality; handing over to client <b>K3-</b> Waste disposal procedures; Care of tools and equipment

**Competency Standard L:     Install domestic wiring**

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: Plan wiring layout; lay cable; perform wiring test; install electrical appliances; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>L1:</b> <b>Plan wiring layout</b>	<b>P1-</b> Draw wiring layout <b>P2-</b> Measure distance to connection points <b>P3-</b> Estimate material <b>P4-</b> Prepare tools, equipment and materials	<b>K1-</b> Interpretation of drawings, symbols, cable number according to load, and colour coding <b>K2-</b> Measuring of units and conversion <b>K3-</b> Quality of different conductor and insulator types <b>K4-</b> Application of tools, equipment and materials
<b>L2:</b> <b>Lay cables</b>	<b>P1-</b> Prepare installation of cable <b>P2-</b> Install conduit, <b>GI</b> pipes, <b>PVC</b> pipes and/or ducts <b>P3-</b> Pull-in cables <b>P4-</b> Connect cables <b>P5-</b> Connect fixtures	<b>K1-</b> Chiselling, ducting, <b>PVC</b> and <b>GI</b> pipe wiring procedures <b>K2-</b> Properties of materials <b>K3-</b> Application of cables and tools <b>K4-</b> Types of joints <b>K5-</b> Types and purpose of fixtures
<b>L3:</b> <b>Perform wiring test</b>	<b>P1-</b> Inspect wiring and distribution board <b>P2-</b> Conduct tests <b>P3-</b> Document test results	<b>K1-</b> Importance of continuity and factors of loose fittings <b>K2-</b> Application of equipment and tools used for testing; Importance of earthing <b>K3-</b> Importance of documenting compliance and noncompliance of test results and subsequent steps to be taken



<b>L4:</b> <b>Install electrical appliances</b>	<b>P1-</b> Interpret and confirm installation specifications <b>P2-</b> Install, position and secure appliances <b>P3-</b> Connect appliance and test for correct operation <b>P4-</b> Confirm completed installation	<b>K1-</b> Interpretation of installation requirements and specifications <b>K2-</b> Importance of correct position and location; Safety precautions <b>K3-</b> Basic operation of appliance and settings to adjust performance; Requirements for good, properly bonded earth <b>K4-</b> Client communication
<b>L5:</b> <b>Complete work</b>	<b>P1-</b> Complete work related documents and procedures <b>P2-</b> Perform final quality inspection <b>P3-</b> Clean up and store tools, equipment and materials	<b>K1-</b> Importance of documentation; Customer care procedures and techniques <b>K2-</b> Importance of quality; handing over to client <b>K3-</b> Waste disposal procedures; Care of tools and equipment

**Competency Standard M: Perform distribution of electrical supply**

**Overview:** This competency standard is intended for those who carry out electrical operations. People holding credit for this competency standard are able to: review electrical load schedule, set distribution priority, monitor electrical load.

Competency Unit	Performance Criteria	Knowledge and Understanding
<b>M1:</b> <b>Review electrical load schedule</b>	<b>P1-</b> Check layout plan <b>P2-</b> Check input & output voltages <b>P3-</b> Check voltage drops	<b>K1-</b> Interpretation of drawings, symbols, cable number, colour coding and electrical load schedule <b>K2-</b> Maintenance of input and output voltages <b>K3-</b> Methods of calculation of voltage drops, overloading and load balance
<b>M2:</b> <b>Set distribution priority</b>	<b>P1-</b> Review distribution priority plan <b>P2-</b> Reschedule electrical load as per distribution priority	<b>K1-</b> Interpretation of distribution priority plan <b>K2-</b> Methods of rescheduling of electrical loads
<b>M3:</b> <b>Monitor electrical load</b>	<b>P1-</b> Monitor electrical load (current) <b>P2-</b> Monitor power consumption (energy) <b>P3-</b> Monitor voltage drops <b>P4-</b> Perform logout/tag out	<b>K1-</b> Methods of current measurement (Amperes) <b>K2-</b> Methods of energy measurement in (KWH) <b>K3-</b> Methods of voltage drop measurement (Volt) <b>K4-</b> Methods of log out / tag out and labelling

**Documents, policies, guidelines:**

- International Labour Organisation (ILO) Standards on Occupational Health and Safety
- Pakistan Electricity Act, 1910 and subsequent amendments
- Institute of Electrical and Electronics Engineers Standards Association (IEEE-SA)
- Industry code of practice

**Tools and Equipment:**

No.	Description	Quantity
1	Personal protective equipment	as per required
2	Tools and equipment for cable works	as per required
3	Hand tools and Powered handheld machine tools	as per required
4	Adjustable power supply	6
5	Barrication kit	12
6	Battery tester	12
7	Bench vice	3
8	Chisel bradawl	6
9	Clamp on meter	12
10	Crimping tool	12

<b>11</b>	Drill machine	2
<b>12</b>	Earthing / discharging set	2
<b>13</b>	Electrician tool kit	24
<b>14</b>	File set	6
<b>15</b>	Fire-fighting equipment	3
<b>16</b>	First Aid kit	1
<b>17</b>	Grinder	1
<b>18</b>	Hacksaw	12
<b>19</b>	Hammer set	6
<b>20</b>	Hipot tester	24
<b>21</b>	Hole saw	2
<b>22</b>	Hydraulic cable cutter	1
<b>23</b>	Hydro meter	6
<b>24</b>	Insolation tester	2
<b>25</b>	IR temperature gun	6
<b>26</b>	Level	6
<b>27</b>	L-scale	12
<b>28</b>	Lugs punch hydraulic	2
<b>29</b>	Magnifier galas	24
<b>30</b>	Magnifier lamp	2

<b>31</b>	Mega meter	2
<b>32</b>	Mili ohm meter	12
<b>33</b>	Mircometer	6
<b>34</b>	Motor test bench	6
<b>35</b>	Motor winding machine	3
<b>36</b>	Multi meter	12
<b>37</b>	Personal protective equipment (PPE)	as per required
<b>38</b>	Phase sequence tester	6
<b>39</b>	Pipe wrench	2
<b>40</b>	Power factor meter	2
<b>41</b>	Screw wrench	12
<b>42</b>	Solder sucker	12
<b>43</b>	Soldering gun	12
<b>44</b>	Sound scope	6
<b>45</b>	Techo meter	3
<b>46</b>	Thimble press plier	2
<b>47</b>	Vernier calliper	6
<b>48</b>	Vibro meter	2
<b>49</b>	Weighing machine	1
<b>50</b>	Winding die set	1
<b>51</b>	Wire gauge	12

**Consumables:**

No.	Description		Quantity
1	Flexible wire	40/0.076 blue	200m
2	Flexible wire	40/0.076Yellow	200m
3	Two core twist wire cable	40/0.076	100m
4	single way switch	5 Amp	24
5	Two way switch	5 Amp	24
6	Two pole main switch	10 Amp	24
7	Two pin socket	5 Amp	24
8	Lamp Holder	Piano Type	24
9	Lamp Holder	Round Type	24
10	Cable 3/0.029		2 Roll
11	Cable 7/0.029		1 Roll
12	Bulb	100W	24
13	Bulb	200W	24
14	PVC Pipe	"1/2x10Ft	6
15	Junction Box	4 Way,2 way	24
16	Ceiling Rose	10 Amp	24
17	Iron Screw	3/16x3/8,3/16x2	2 Pak
18	Wooden Screw	"1,"3/4	2 Pak
19	Wooden Screw	1x1/2,"2	2 Pak

<b>20</b>	Plug shoe	10 Amp	12
<b>21</b>	Tube Rod	40w	6
<b>22</b>	Tube starter	220V	12
<b>23</b>	Timer Washing Machine	220V	6
<b>24</b>	Selector switch	220V	6
<b>25</b>	Indicator	220V	12
<b>26</b>	Insulation Tap	Neeto	24
<b>27</b>	Fan Capacitor	(3.5uf)	6
<b>28</b>	Motor capacitor	(80/110 uf)	6
<b>29</b>	Connector	(15A)	12
<b>30</b>	Element	(750w)	12
<b>31</b>	Fibre Washers	7/16 inch	2 Pak
<b>32</b>	Iron Screws different size	½, ¾, 1", 1.5"	4 Pak
<b>33</b>	Soldering wire	60/40	6
<b>34</b>	Paste for soldering	Local	6 Pak
<b>35</b>	Wiring & Winding Material	Wooden, PVC Board, Ducts, etc	As required
<b>36</b>	Varnish		30 Pak
<b>37</b>	Cotton Tap		30 Rolls
<b>38</b>	Winding Wire#30		5 Kg
<b>39</b>	Winding Wire#32		5 Kg
<b>40</b>	Winding Wire#34		1 Kg

41	Winding Wire#35		1 Kg
42	Winding Wire#36		1 Kg
43	Winding Wire#21		
44	Winding Wire#19		
45	Winding Wire#20		
46	Transformer Bobn (Chose Size)		30
47	Leathried Paper#7		15 Feet
48	Leathried Paper#10		25 Feet
49	Salvees (Different Size)		50 No.
50	LED		120
51	Diode		120
52	Carbon Resistor		150
53	Resister 5 Watt		30
54	Capacitor	16 Volt 1000 uf	30
55	Transistor	NPN, PNP	60
56	Photo Diode		15
57	Rod & Stator Holder		10 each
58	Hydro Meter		04
59	Float Switch		05
60	Energy Saver	24 W	12
61	Transformer Core	Different size	As per required
62	Transformer bobbin	Different size	As per required
63	Winding Wire for Transformer Winding	Different size	As per required




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