



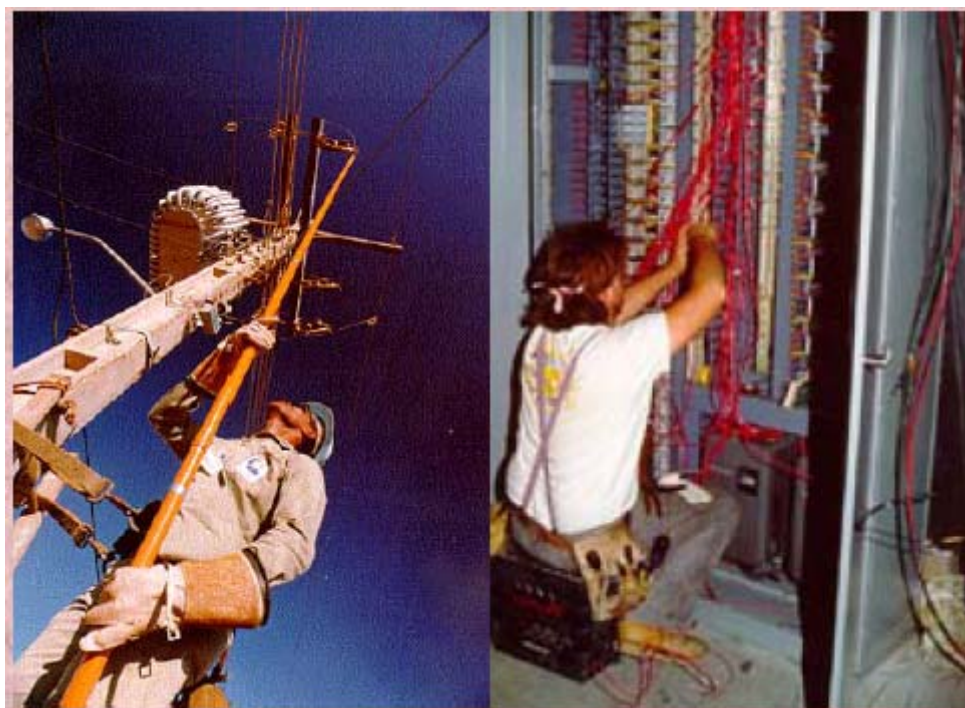
**I. R. D. T**  
INSTITUTE OF RESEARCH DEVELOPMENT AND TRAINING

## SYLLABUS

SIX MONTHS – FULL TIME

ELECTRICIAN AND MOTOR WINDING

EFFECTIVE FROM:-



**UNDER DEVELOPMENT**

**Prepared By:**  
**Curriculum Development Cell**

**INSTITUTE OF RESEARCH DEVELOPMENT AND TRAINING**  
**KANPUR**

1. Title of the course : ELECTRICIAN AND MOTOR WINDING

2. Duration of the course : Six Months

<b>Module</b>	<b>Contents</b>	<b>Duration</b>	<b>Ratio</b>	
<b>I</b>	<b>Basic Electrical</b>	<b>4 Weeks</b>	<b>2 T/DAY</b>	<b>4 P/DAY</b>
<b>II</b>	<b>Repair of Home Appliance</b>	<b>4 Weeks</b>	<b>2 T/DAY</b>	<b>4 P/DAY</b>
<b>III</b>	<b>House Wiring</b>	<b>4 Weeks</b>	<b>2 T/DAY</b>	<b>4 P/DAY</b>
<b>IV</b>	<b>Transformer Winding</b>	<b>4 Weeks</b>	<b>2 T/DAY</b>	<b>4 P/DAY</b>
<b>V</b>	<b>Armature Winding</b>	<b>4 Weeks</b>	<b>2 T/DAY</b>	<b>4 P/DAY</b>
<b>VI</b>	<b>Rewinding of AC/DC Motor</b>	<b>4 Weeks</b>	<b>2 T/DAY</b>	<b>4 P/DAY</b>

\* T-Theory

\* P-Practical

Kindly mail your suggestions to [director\\_irdt@rediffmail.com](mailto:director_irdt@rediffmail.com)

**Basic Electrical**  
**Duration 4 Weeks**  
**(Module 1)**

Basic Electrical Theory

1.	Safety practice – o Lifting and handling loads. o Heavy Equipments
2.	Safety practice – o Fire extinguishers o Types of fire extinguishers
3.	General safety of tools and equipments
4.	Electrical safety o Rescue a person who is in contact with live wire.
5.	o Treat a person for electric shock/injury.
6.	Introduction to Electricity Conductors and types of conductors Insulators and types of insulators Crimping & crimping tool Soldering
7.	Define simple electrical terms like voltage, current, resistance and their units.
8.	Simple series and parallel circuits
9.	Direct current and testing the polarity Alternating current and identifying phase, neutral and earth terminals
10.	Purpose of Earthing Types of Earthing. o Pipe Earthing o Plate Earthing
11.	Simple house wiring circuit.

Basic Electrical Practical

1.	Safety practices – lifting and handling.
2.	Safety practices – Fire fighting
3.	Nature of working of tools and equipments.
4.	Electrical safety practice o Rescue a person who is in contact with live wire.
5.	Treat a person for electric shock/injury.
6.	Prepare Terminations o Skinning Different types of cable ends o Make various joints in cable o Crimping cable ends. o Soldering the cable lugs
7.	Simple electrical connections using resistance, voltmeter, and ammeter, multimeter
8.	Connecting number of lamps in series connection.
9.	Connecting number of lamps in parallel connection.
10.	Testing the polarity of DC supply. Identification of phase and neutral in single phase supply
11.	Carry out of pipe earthing Carry out of plate earthing
12.	Repairing of house wiring faults.

**Repair of Home Appliance**  
**Duration 4 Weeks**  
**(Module 2)**

Theory

1.	Install, service and repair all kinds of electrical home appliances
2.	Repair and rectification of an automatic electric iron, servicing and repairing of mixer, ceiling and table fan.
3.	Assemble and install a fluorescent6 lamp.
4.	Thermostat heat controls of Automatic electric iron, steam iron, spray irons. Understand home appliances like heater, iron, kettle ceiling fan, table fan, washing machine etc.
5.	Maintenance of decorative serial lamp for a required supply voltage
6.	Assemble, connect and install a twin fluorescent lamp with accessories
7.	Repair and service technique of cooking range, storage water heater, washing machines, wet grinders. Replace the heating element in a soldering.

Practical

1.	Safety precaution
2.	General repair of heating iron, kettle, ceiling fan, table fan, washing machine etc.,
3.	Test the fan capacitors. Clean and lubricate the bearing of ceiling and table fan, and check the speed. Regulator of both fan.
4.	Measure the insulation resistance between the terminals and body of the appliance. Check the oscillator mechanisms of table fan
5.	Select the fuse size according to the load of circuit
6.	Dismantle and reassemble automatic iron, ceiling fn table fan cooking range, storage heater, washing machines, and wet grinders etc.
7.	Determine the number of lamps to be connected in series for particular supply voltage for making decorative serial lamp.
8.	Check the internal connections of cooking range selector switch and circuits. connections in different temperature arrangements
9.	Check the simple mechanical timer, small water pump of washing machines and regular service and faults.
10.	Repair of house wiring.

**House Wiring**  
**Duration 4 Weeks**  
**(Module 3)**

Theory

1.	ISI rules related to wiring (General)
2.	Introduction to electricity. Conductor & Insulator. Joints in Electrical Conductor
3.	Diagram and systems used in domestic. wiring installation
4.	Earthing – Types. Earthing domestic installation. I E rule for Energy meter Installation.

Practical

1.	Safety precaution
2.	Common hand tools, their uses, care and maintenance.
3.	Identify the wiring accessories as per symbols.
4.	Make simple twist joints. Make married joint in stranded conductors. Make tee joint in stranded conductor.
5.	Prepare T.W Board for fixing Flush type accessories.
6.	Make the wiring layout for a bed room of a house with 6 points.
7.	Carryout the wiring in PVC casing and capping as per layout.
8.	Carryout pipe earthing as per I E rule.
9.	Prepare and mount energy meter board
10.	Carryout domestic installation testing

**Transformer Winding**  
**Duration 4 Weeks**  
**(Module 4)**

Theory

1.	Identification of phase and neutral in single-phase A/C. supply,
2.	Test a single-phase transformer for its continuity and insulation.
3.	Measuring a enameled winding wire with Std wire gauge.
4.	Wind/rewind a small transformer
5.	Use & Operation of hand operated and motorized coil winding machine. Impregnation Varnish after testing the transformer – its advantages.

Practical

1.	Safety precautions
2.	Testing the supply using test lamp with different wattage lamps.
3.	Take the dimensions of a bobbin and prepare the bobbin from suitable materials
4.	Measure and also determine the size of winding wire for primary and secondary
5.	Dismantle /reassemble the transformer cores
6.	Wind the primary and secondary winding layer by layer.
7.	Familiarization and operation with the motorized coil winding machine – General maintenance to be done Test the transformer for insulation, transformation ratio and performance

**Armature Winding**  
**Duration 4 Weeks**  
(Module 5)

Theory

1.	Type of winding like lap and wave winding Introduction to armature winding Method of dismantling the burnt winding wire.
2.	Terminology used in winding like pole pitch coil pitch back and front pitch progressive and retrogressive winding etc.
3.	A/C/DC armature winding.
4.	Preparation of winding data for given armature.
5.	Preparation of winding table , connection diagram, winding diagram for given armature.
6.	Impregnation methods of armature after rewinding and testing.

Practical

1.	Safety precautions
2.	Study the parts of armature. Check and test the armature. the old winding from the armature
3.	Record the winding data
4.	Prepare the armature for rewinding
5.	Wind the coils by hand insulate them
6.	Connection of armature leads on raiser.
7.	Understand end connection, electrical and distinguishing start and finish of each
8.	Varnish the armature winding

## Rewinding of AC/DC Motor

### Duration 4 Weeks

#### (Module 6)

#### Theory

1.	Knowledge about Single phase and 3-phase supply.
2.	Introduction to re-winding Insulating material used
3.	Terminology used in single phase and three phase winding like pole pitch coil pitch etc.,
4.	Method of stripping the old winding and preparing the winding former and the coils.
5.	Preparation of winding data for given Motor.
6.	Procedure followed for re-winding of all kind of electric motors like single phase A./C. motors, pump motors, ceiling fan motors, table fan motors, washing machine motors etc.
7.	Various methods used of inserting coil into the slots. Preparation of winding table , connection diagram, winding diagram for given Motor.
8.	Test to be done after re-winding-impregnation methods of winding

#### Practical

1.	Safety Precaution
2.	List the conducting and insulating materials used in motor winding
3.	Testing the motor before declaring for rewinding
4.	Prepare the winding former and the coils
5.	Method of stripping the old winding and preparing the winding former and the coils
6.	Method of inserting coil in the slots.
7.	Making end connections
8.	Testing the motor after rewinding
9.	Impregnation methods of winding



## Tools & Equipments

1. Connector, 6"
2. Screw Driver 8" 10", 12"
3. Cutting Pliers 6", 8"
4. Neon Tester
5. Heavy Duty Screw Driver 10", 12"
6. Nose Pliers 6"
7. Crimping tool
8. Volt meter 0-600 V (MC Type)
9. Volt meter 0-600 V (MI Type)
10. Ammeter 0-5 (MC Type)
11. Ammeter 0-5 (MI Type)
12. Watt meter 0-2.5KW
13. Energy meter 0-10A,240V
14. Multimeter
15. Megger 500V
16. Line Tester
17. Types of fire extinguishers
18. Common tools used in electrical field.
19. Soldering iron 25W, 250V
20. Electric Heater
21. Electric Iron
22. Electric Kettle
23. Ceiling Fan
24. Table Fan
25. Washing machine
26. Automatic Iron
27. Storage Heater
28. Cooking Range
29. Wet grinder
30. Round Nose Plier 15cm
31. Electrician Knife 10cm
32. BP Hammer 1/2kg,1/4kg
33. Cold Chisel 15cm
34. Tri Square 30cm
35. Fermer Chisel 14cm,20cm, 25cm,
36. Poker 15cm
37. Power Drilling Machine 6mm
38. Hacksaw 30cm
39. Wire shipper 10cm
40. Measuring Tape 5Metr
41. Standard Wire Gauge
42. Motorized coil winding machine
43. Hand operated coil winding machine
44. Grumbler
45. Bench Wise



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**DATA ENTRY OPERATOR**

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## **DATA ENTRY OPERATOR**

Name of the course:	Data Entry Operator
Duration:	Six Months
Entry Qualification: Essential:	(i) 10 <sup>th</sup> Class Passed (ii) Typing in English Desirable: Typing Hindi/Any Local Language
Batch Size -	20 Trainees per Batch

### **Contents**

1. Basic Training -	1 Week
2. Computer Fundamentals -	1 Week
3. Boot Operation & Storage device	1 Week
4. Operating System (Windows) -	1 Week
5. Essential Accessories & Settings	1 Week
6. MS Word -	4 Weeks
7. MS Excel -	3 Weeks
8. MS PowerPoint -	1 Week
9. MS Access -	2 Weeks
10. PageMaker -	2 Weeks
11. Financial Accounting Software -	2 Weeks
12. Networking concepts -	1 Week
13. Internet -	2 Weeks
14. Local Language Software -	2 Weeks
15. Data Entry Practice -	1 Week
16. Revision & Test -	1 Week

Kindly mail your suggestions to [director\\_irdt@rediffmail.com](mailto:director_irdt@rediffmail.com)

S.No.	Theory
1.	<p><b><u>Basic Training</u></b>            Safety precautions, Electrical safety, types of fire extinguishers. Artificial Respiration. Data, Information, data types, physical &amp; logical concepts of data.</p>
2.	<p><b><u>Computer Fundamentals</u></b>            Basic definition of computer, features and applications, hardware, software, firmware and liveware. Representation of information inside a computer. Generation of Computers – classification of computers according to purpose(general and special purpose), according to working(analog, digital and hybrid), according to processing capability (Super, mainframe, mini, micro, laptop and palmtop) Block diagram of a Computer system – Standard and common input/output devices. Processing – CPU, ALU, CU Memory, unit and different types Bit, byte, kilobyte, megabyte and gigabyte Semiconductor memories such as ROM, RAM, PROM, EPROM, EEPROM.</p>
3.	<p><b><u>Boot Operation &amp; Storage device</u></b>            Primary storage device &amp; Secondary storage devices – Hard disk, magnetic tapes, floppy disk and CDs. Storage &amp; retrieval of data – concepts of tracks, sectors, cylinders, boot record, disk partition and file allocation tables (FAT). Types of software – system software &amp; application software, functions of operating system, interpreter, compiler and assembler.</p>
4.	<p><b><u>Operating Systems</u></b>            Operating system -familiarization with MS DOS, Windows and Unix. Booting the computer – booting, post, booting sequence, cold boot, warm boot, booting in DOS and Windows, booting files and their functions. Concept of Lilo booting. MS Windows – different versions, advantages and applications of windows. Starting windows and their operations. File management through Windows explorer.</p>
5.	<p><b><u>Essential Accessories &amp; Settings</u></b>            Applications of essential accessories such as notepad, WordPad, paintbrush, images, calculator, calendar, media players and sounds. Multimedia. Setting, using and applications of control panel. Display properties, sound properties, different screen savers, and font management. Installation of programs. Setting hardware such as scanners printers modem and dialup network. Concepts of zipping and unzipping and applications. Using CD drives, different types and capacities of CDs Cd writer. Computer virus – their causes and remedial measures. Anti virus, virus scanning and deleting.</p>
6.	<p><b><u>MS Word</u></b>            Data processing. Data processing in various software, their features, versions And advantages. Operation of MS WORD. Application of MS Word Document enhancement MS word advanced applications Printers, resolution, specifications different types and their applications. Scanners specification and applications.</p>

7.	<b><u>MS Excel</u></b> Spreadsheet packages, MS Excel Application and Excel commands. Advanced application of MS Excel
8.	<b><u>MS PowerPoint</u></b> working and applications.
9.	<b><u>MS Access</u></b> Concept of Database/relational database management systems Records, fields, files, different types of fields Various types of database systems Introduction to various database languages such as dbase, FoxPro, Visual Basic, Oracle and SQL.
10.	<b><u>PageMaker</u></b> – introduction to various versions, concepts and applications Application of PageMaker
11.	<b><u>Introduction of Accounting</u></b> , vouchers, ledger, bank books, cash books, trial balance and balance sheets, golden rules of accountancy. Introduction to Financial accounting Software such as Talley, Ace, Ex engine (Any one of these software)
12.	<b><u>Networking concepts</u></b> , LAN, WAN, their applications.
13.	<b><u>Internet</u></b> , intranet, ISDN, Broad brand concepts and applications.
14.	<b><u>Local language software</u></b> , concepts and applications.

Week No.	Practical
1	Safety precautions, Electrical Safety. Demonstration and operation of Fire Extinguishers. Demonstration of Artificial Respiration
2	Visit to establishments with general purpose and special purpose computers. Visit to Computer centers installed with Mini and Micro computers. Familiarisation of Laptop Computers. Identification and using different input/output devices. Connecting and dismantling cords, cables and input/output devices. Identifying and handling of different types of Floppies and CDs. Understanding the keys and their functions in keyboard. Practicing mouse.
3	Operating system Working with MS DOS, Operating Hard disks and floppy disks. Demonstrating the partition of hard disk. Booting process. Booting computer in DOS and Windows environment Practicing DOS commands - formatting, copying, deleting, moving and renaming etc.
4	MS Windows Using desktop, task bar, start button, title bar, menus and windows help. My computer & Recycle bin. Creating, deleting and renaming of files, folders & short cuts. Opening & closing of different windows. Using different windows at a time. Moving through windows and mouse, maximize/minimize windows, use of help feature, exit windows starting an application and closing application. File management through Windows Explorer - select files and directories, copy, move, delete files/directories. Expand compressed directories and files. Open and manage multiple director windows. View and sort files. Creating and renaming files/directories. Disk operation using file manager.
5	Using essential accessories – starting and using notepad, WordPad, editing formatting text, saving text and printing text in notepad/WordPad. Working with image, paintbrush. Using calculators, calendar and character map, system tools, entertainment. Using windows media player and sound. Using multimedia and accessibility. Setting, using control panel, setting of date, time and sound. Setting display properties – wallpaper, screen savers & font management. Setting sound cords and graphic adopter cords. Installing and removing programs from start and program menu. Setting hardware such as printers, scanners, modem and dial up network. Zipping and unzipping files in windows. Installing Cd Drive, driver software and other software through CD drives, working with CDs and copying data in CD writer. Registrating the software. Installing Antivirus software. Scanning and deleting virus.
7	Table formation, Tabs, indents. Using interface(Menu tool bars, help). Finding and replacing text. Spell checking, creating bold, italic and underlines, aligning text, auto numbering/bullets, colouring text, changing fonts and their sizes, paragraph setting, changing cases, spacing between words, lines and paragraphs.

8	Documentation enhancement – adding borders and shading, headers and footers. Setting up multiple columns, sorting blocks, margins and hypernating documents Creating master documents, data sources, merging documents, using mail merge feature for labels and envelops Graphics and using templates and wizards Hyper linking, sending through internet
9	Inserting drawings, auto shapes, text boxes, word art, pictures such as images and clip art, colouring, shading and 3D effects. Inserting graphs. Rotating text, pictures, text wrapping. Creating tables, editing text in tables, adding, deleting columns and rows. Macro functions Operating various types of printers – dot matrix, inkjet and laser printers. Operating scanner, scanning text, images and photographs with colour effects.
10 to 12	MS Excel Worksheet basics Data entry in cells, entry of numbers, text and formulae Moving data in worksheet, moving around in a worksheet, selecting data ranges Using interface(Tool bars, Menus), editing basics, working with workbook Saving and quitting, cell referencing Formatting and calculations, using auto fill, working with formulae Efficient data display with data formatting Creating borders colouring text, bold, italic and underlining, aligning text, finding and replacing data Margin setting working with ranges, setting print area and printing Advanced application of MS Excel Creating multiple sheets in a worksheet, transferring data from one sheet to other sheet Working with multiple sheets and files Working with graphs and charts Auto formatting, creating embedded chart using chart wizard, sizing and moving parts, updating charts, changing chart types Creating separate chart sheet, adding titles, legends and gridlines, colouring charts, printing charts Functions of Excel Database management through Excel Finding records with data form, adding deleting records, Sorting & filtering rleconds in a work sheet
13	MS PowerPoint Creating slides, designing slides, back ground, layout of slides Editing text, adding/deleting aligning, making bold, italic and underlining, colour text Changing background colours and designs Creating auto shapes, drawing clip art, word art, text boxes, images, shading and 3-d effects. Rotating text and pictures, text wrapping Saving, quitting and printing slides Inserting new slides, making animation effects Viewing the slides, slide transition, making sound effects Grouping and ungrouping the objects.
14 & 15	MS Access Working with Access, files, records, creating files, records, creating table with different fields such as number, text, date/time etc. Entering data, modifying structure, modifying data in tables, forms, reports and queries. Hyperlinking with Excel and Word Practicing data entry in Access

16	PageMaker Working with tool bar Setting defaults Opening, saving and closing publications Inserting and removing pages Flowing text, resizing the object Adjusting graphics or text objects, select multiple elements, selecting elements behind the others, mask and group, unmask and ungroup. Constrain move vertically/horizontally Paste items, editing objects, rotating text box Layout window, viewing pages, changing previous and next pages, zooming and hyperlinks
17	Font style, size, case, subscript and superscript Special characters, bullets, page numbering Spacing of character, line, word and paragraph, breaking and non breaking Text editing – selecting word, paragraph and a range of text Indenting/Tabs Find and change dialogue box Text recomposition Compress paint, JPG and GIF files Pallet controls, colour pallets, styles pallet and master pages pallet Removing master page objects from pages, control pallets Making tables, editing data in tables. Filing, stroking, frames, arranging, text wrapping, grouping and ungrouping, locking and unlocking, mask/unmask image, polygon setting, rounded corners
18 & 19	Entering vouchers, creating ledgers, maintaining cash books, bank books, preparation of trial balance & balance sheet and budget estimates Practicing any one of Financial Accounting Software such as Talley, Ace or Ex Engine Learning keyboard short cuts.
20	Working with LAN Basic operation of LAN. Data entry in other clients, data storing in different clients. Data shearing from server and other clients. Practicing data entry in networking.
21 & 22	<u>Internet</u> Operations, browsing, downloading articles and other text, down loading picture from internet, sending and receiving emails sending and receiving attachments.
23 & 24	Introduction to local Language software such as Algal, I-leap, Chalontika, Leap-office (Any one of this software) Practicing of Data entry in Hindi or any other local languages software
25	Assignment Presentation
26	Revision & Test



## **LIST OF TOOLS & EQUIPMENTS**

Sl. No.	Item Name, Description & Specification	Quantity
<b>HARDWARE</b>		
1	Pentium IV Processor with MMX, 2 GHz, 512 MB DDR RAM, 80 GB HDD, 3.5" FDD, 52 x CD Drive, 15" SVGA Colour Monitor with 32 MB Graphic Adopter, 3 button Mouse, 105 keys key board and built-in speakers and mic. Or higher versions.	12 No.
3	CD Writer	1 No.
4	Laser Printer Black	1 No.
5	Inkjet Printers (Colour & Black)	2 Nos.
6	Scanner	1 No.
7	24 port 10/100 Switch	1 No.
8	Ethernet cords 10 x 100 mpb	10 Nos.
9	UPS 1 KVA	2 Nos.
10	Air Conditioner 1.5 tonne	2 Nos.
11	Modem	1 No.
12	Telephone line (For Internet)	1 No.
13	Room temperature thermometer	1 No.
14	Fire extinguisher	1 No.
<b>SOFTWARE</b>		
1	Network Software with 10 User license	1 No.
2	MS Office latest version	1 No.
3	Adobe PageMaker latest version	1 No.
4	Anti Virus Latest version	1 No.
5	Algol/Chalontika/I-Leap/Leap-Office software latest version) (An one of these or any other multi lingual	1 No.
6	Fact/Talley/Ace, Ex Engine (Any one of these or any other Financial Accounting Software latest version).	1 No.
<b>FURNITURE</b>		
1	Computer Tables	12 Nos.
2	Printer Tables	4 Nos.
3	Instructor Table	1 No.
4	Instructor's Chair	1 No.
5	Steel cupboards drawer type	3 Nos.
6	Cabinet with drawer	2 Nos.
7	Students Lockers (steel) unit of 4 lockers	5 Nos.
8	Steel almirah big size	1 No.
9	Steel almirah small size	2 Nos.
10	Class room chairs with writing pad moulded type	20 Nos.
11	Straight back revolving & adjustable chairs (Computer Chairs)	20 Nos.