

I. OBJECTIVES OF THE COURSE

1. To develop competence in maintenance servicing and repair of tractor, power triller, engines (Diesel and Petrol) power drives from equipment, pumps, Sprinkler and drip equipment, combine - Harvestors. Two wheelers and Four Wheelers and also refrigeration and Air Conditioning equipment
2. To develop middle level Human resource for meeting the skilled man power needs of agricultural farms, industries in organised and small scale sectors,
3. To train and develop young entrepreneurs for self-employment.
4. To develop skilled manpower for efficient handling of power driven from machinery.

II. JOB OPPORTUNITIES

(a) WAGE EMPLOYMENT

1. Tractor driver/operator cum mechanic
2. Farm mechanic/technician/workshop technician/tractor mechanic
3. Pump/tube well operator cum mechanic
4. Farm workshop assistant/Farm machinery manufacturing assistant
5. Fieldman/field assistant
6. Farm machinery demonstrator
7. Technician (Domestic appliances) Electrical and Mechanical maintenance
8. Technician (Solar System)
9. Agro-Department, Store Keeper (Mechanical)
10. Sales Assistant
11. AP Transco / AP Genco / APSRTC / RWS / Railways / all Departments Mechanical Sections

(b). SELF EMPLOYMENT

1. Customer hiring of agricultural machinery and irrigation pumps
2. Farm machinery repair and service workshop
3. Sales of agricultural machinery, spares
4. Installation and maintenance of Bio-gas plants
5. Installation and maintenance of Solar plants
6. Servicing and maintenance of Refrigeration and Air Conditioning Equipments
7. Servicing and maintenance of Electric appliances and domestic appliances
8. Welding works and General Engineering works.

III. (a) SCHEME OF INSTRUCTION AND EXAMINATION

Annual Scheme of Instruction and Examination for Vocational Courses 1st & 2nd Year

Part - A	Theory		Practicals		Total	
	Periods	Marks	Periods	Marks	Periods	Marks
1. English	185	75	-	-	185	75
2. G.F.C.	185	75	-	-	185	75
Part - B						
3. Vocational Subjects						
Paper - I	160	50	160	50	320	100
Paper - II	160	50	160	50	320	100
Paper - III	160	50	160	50	320	100
Part - C						
4. On the Job Training -		-	210	50	210	50
Total	850	300	690	200	1540	500

Scheme of Instruction per week for Vocational Courses

Part - A	Theory	Practicals	Total
1. English	6	-	6
2. G.F.C.	6	-	6
Part - B			
3. Vocational subjects			
Paper - I	5	5	10
Paper - II	5	5	10
Paper - III	5	5	10

VI(B) LIST OF SUBJECTS IN RURAL ENGINEERING TECHNICIAN

FIRST YEAR

Theory

1. Workshop Technology (Theory Paper I)
2. Mechanical Technology (Theory Paper II)
3. Electrical Technology (Theory Paper III)

Practical

1. Workshop practice (Practical Paper I)
2. Engineering Drawing (Practical Paper II)
3. Electrical Computer Fundamentals lab (Practical Paper III)

SECOND YEAR

Theory

1. Non-Conventional Energy Sources (Theory Paper I)
2. Farm Equipment & Tractors (Theory Paper II)
3. Domestic Appliances (Theory Paper III)

Practical

1. N.C.E. Sources Lab (Practical Paper I)
2. Farm Machinery Lab (Practical Paper II)
3. Domestic Appliances Lab (Practical Paper III)

**RURAL ENGINEERING TECHNICIAN
I YEAR
WORK SHOP TECHNOLOGY
THEORY - PAPER I**

Sl. No.	Major Topics	No.of Periods	Weightage Marks
1	Safety Precautions and Details of Engineering Materials	20	08
2	Fitting & Drilling	25	10
3	Sheet Metal Work	15	08
4	Carpentry	20	08
5	Forging and Welding	25	10
6	Foundry	20	08
7	Mechanical Working of Metals	20	08
8	Lathe and Grinding	15	08
	Total	160	68

RURAL ENGINEERING TECHNICIAN - 1st YEAR WORKSHOP TECHNOLOGY

Details Syllabus

Chapter 1 : Safety Precautions & Details of Engineering materials.

Contents : Importance of Safety precautions in workshop.

Properties and uses of common Engineering Materials such as Cast Iron, Mild Steel, High Carbon Steel, Alloy Steel, Stainless Steel, Copper, Brass, Tin Zinc, Gunmetal, Bronze, White metal, Aluminum, Non Metals : Wood, Plastic, Rubber.

Chapter 2 : Fitting and Drilling

Contents : Cutting Tools - Chisels, Hacksaws, files, scrapers, Drill Bits, reamers Taps, Dies and Sockets.

Striking tools : Hammers

Holding Devices : Vices

Marking Tools & Miscellaneous tools

Checking & Measuring Instruments Calipers & Dividers

Drilling Machines - Sensitive and Radial

Drilling Machines - Various Fitting and Drilling operations

Chapter 3 : Sheet Metal Work

Contents : Metals used for sheetmetal work, sheet metal hand tools - measuring and cutting tools, stakes.

Sheetmetal operations - Shearing, bending, Drawing, Squeezing

Sheet metal joints - Hem & Seam Joints Fastening Methods - Riveting, soldering Brazing and spot welding.

Chapter 4 : Carpentry

Contents : Marking & Measuring Tools, Cutting Tools, Saws, Chisels, planes, Boring Tools, striking tools.

Holding Devices & Miscellaneous Tools Carpentry process, carpentry joints wood working Machines

Chapter 5 : Forging & Welding

Contents : Hand Tools, Heating Devices, Smith Operations, Machine Froging, Forging hammers, Forging press
Welding : Arc welding & Gas Welding

Chapter 6 : Foundry

Contents : Advantages and limitations of Casting, foundry equipment
- Hand moulding Tools, Moulding Boxes
Types of sands and properties.
Patterns : Classification & Making; Cores & Core making
Casitngs : Green sand and dry sand moulding, Shell Moulding, ceramic moulding, Special castings, Defects in castings.

Chapter 7 : Mechanical Working of Metals

Contents : Hot working process - Rolling, Piercing, Drawing, Spinning, Extrusion.
Cold Working Process : Rolling, Bending, drawing, spinning, Extrusion, squeezing, peening
Advantages and limitations of cold working & Hot working

Chapter 8 : Lathe & Grinding

Contents : Lathe main parts, simple operations Grinding - working principle; Grinding wheel materials, Applications of Grinding.

RURAL ENGINEERING TECHNICIAN - 1ST YEAR
SUB : MECHANICAL TECHNOLOGY
THEORY - PAPER II

Sl. No.	Major Topics	No.of Periods	Weightage Marks
1.	Thermo Dynamics	12	04
2.	Laws of Tehermodynamics	6	02
3.	Laws of perfect gases	16	10
4.	Thermo dynamics process in gases	20	08
5.	Fuels and combustions	20	08
6.	Air standard cycles	6	08
7.	I.C. Engines	40	12
8.	Pumps	20	08
9.	Sprinklers	20	08
	Total	160	68

RURAL ENGINEERING TECHNICIAN - 1st YEAR
MECHANICAL TECHNOLOGY

Details Syllabus

Chapter-1 : Thermo Dynamics

- 1.1. Introduction
- 1.2. Thermo dynamic system
- 1.3. Types of thermo dynamic systems
- 1.4. Properties thermodynamic systems
- 1.5. Definitions of properties like pressure (P) Volume (V) Temperature (T) Enthalpy, Atmospheric pressure, Internal Energy, specific heat

Chapter-2 : Laws of Thermo Dynamics

- 2.1. Zeroth law of thermodynamics
- 2.2. First law of thermodynamics
- 2.3. Second law of thermo dynamics

Chapter-3 : Laws of Perfect Gases

- 3.1. Introduction
- 3.2. Brief Explanation of Boyles Law, Charles Law, Avagadro's Law, Joules law, Regnaults law
- 3.3. Characterestic of gas equation
- 3.4. General gas equation

Chapter-4 : Thermo dynamics process in gasses

- 4.1. Types of thermodynamic processes
- 4.2. Constant volume process, constant pressure process, constant temperature process, Adiabatic process, polytropic process
- 4.3. Equation for work done during the above processes and calculations of change of internal energy
- 4.4. Evaluation of heat supplied or rejected during the process

Chapter-5 : Fuels and combustions

- 5.1. Introduction
- 5.2. Types of fuels, solid fuels, liquid fuels,gaseous fuels
- 5.3. Merits and demerits of liquid fuel
- 5.4. Merits and demerits of gaseous fuels
- 5.5. Calorific value

Chapter 6 : Air Standard Cycles

- 6.1. Introduction
- 6.2. Study of cornot cycle, Otto Cycle, Diesel Cycle
- 6.3. Comparison of Otto Cycle and Diesel Cycl

Chapter 7 : I.C. Engines

- 7.1. Heat Engines
- 7.2. Classification of engines
- 7.3. Classification of I.C. Engines
- 7.4. Working principle of two stroke petrol and diesel engine
- 7.5. Working principle of four stroke petrol and diesel engine
- 7.6. Comparision between two stroke and four stroke cycle engine
- 7.7. Comparision between petrol & diesel engine

Chapter 8 : Pumps

- 8.1. Functions of a pump
- 8.2. Classification of pumps
- 8.3. Applications of pump
- 8.4. Working of centrifugal, reciprocating, jet, submessible pumps

Chapter 9 : Sprinklers

- 9.1. Introduction
- 9.2. Components of Sprinklers
- 9.3. Drip Irrigation system
- 9.4. Different components
- 9.5. Cleaning of filters nozzles, drips
- 9.6. Installation and pipe fittings

RURAL ENGINEERING TECHNICIAN- 1st YEAR
ELECTRICAL TECHNOLOGY
THEORY - PAPER II

Sl. No.	Major Topics	No.of Periods	Weightage Marks
1	Safety	05	02
2	Basic Electricity	25	08
3	Work, Power and Energy	15	08
4	Conductors and Insulators	15	02
5	Electrical Accessories	15	08
6	Magnetism and Electro Magnetism	25	08
7	Electro Magnetic Induction	10	08
8	Electrical Machines	20	08
9	Electrical Appliances	15	08
10	Batteries	15	08
	Total	160	68

PAPER-III
RURAL ENGINEERING TECHNICIANS
ELECTRICAL TECHNOLOGY
I YEAR

Chapter -1 : Safety

- 1.1. Introduction
- 1.2. Safety precautions
- 1.3. Removal from Electric Shock
- 1.4. Methods of Artificial Respiration
- 1.5. Hand tools of an electrician.

Chapter -2 : Basic Electricity

- 2.1. Introduction
- 2.2. Electric Potential
- 2.3. Potential Difference
- 2.4. Resistance
- 2.5. Current
- 2.6. Ohm's Law
- 2.7. Problems on ohm's Law
- 2.8. Laws of Resistance
- 2.9. Specific Resistance
- 2.10. Specific Conductivity
- 2.11. Effects of Temperature on Resistance.
- 2.12. Series and parallel connections of Resistance
- 2.13. Simple problems on series and parallel
- 2.14. Kirchoff's laws
- 2.15. Problems on Kirchoff's Law
- 2.16. wheat stone Bridge

Chapter -3 : Work, power and Energy

- 3.1. Work and its units
- 3.2. Power and its units

- 3.3. Energy and its units
- 3.4. Electrical power
- 3.5. Electrical Energy
- 3.6. Simple problems on Monthly electricity bills.

Chapter - 4 : Conductors and Insulators

- 4.1. Conductors
- 4.2. Properties of conductors
- 4.3. Insulators
- 4.4. Properties of insulators
- 4.5. Semi conductors
- 4.6. Grading of conducting wires.

Chapter -5 : Electrical Accessories

- 5.1. Electrical Accessories and their uses
- 5.2. Switches and their types
- 5.3. Lamp holders and their types
- 5.4. Ceiling rose
- 5.5. Pin plug
- 5.6. Socket and adopter
- 5.7. Fuses
- 5.8. Wires and cables

Chapter - 6 : Magnetism and Electro Magnetism

- 6.1. Some important Definitions of Magnetism
- 6.2. Magnetic field
- 6.3. Magnetic poles
- 6.4. Magnetic lines of force
- 6.5. Magnetic flux
- 6.6. Flux Density
- 6.7. Magneto motive force
- 6.8. Reluctance

- 6.9. Care and maintenance of magnets
- 6.10. Magnetic field around a current carrying conductor
- 6.11. Comparison between Electric and Magnetic Circuits.

Chapter - 7 : Electro Magnetic Induction

- 7.1. Faraday's Laws of Electromagnetic Induction
- 7.2. Lenz's Law
- 7.3. Flemings Right hand rule
- 7.4. Self Inductance
- 7.5. Mutual Inductance.

Chapter - 8 : Electrical Machines

- 8.1. D.C. Generator
- 8.2. Principle of working
- 8.3. Parts of Generator
- 8.4. D.C. Motors
- 8.5. Principle of Working
- 8.6. Parts of motor
- 8.7. Flemings Left hand and Right hand rule
- 8.8. Trouble shooting in an electric motor.

Chapter -9 : Electrical Appliances

- 9.1. Immersion Rod
- 9.2. Electric Iron
- 9.3. Electric stove
- 9.4. Geyser
- 9.5. Water Heater
- 9.6. Ceiling Fan

Chapter-10 : Batteries

- 10.1. Batteries
- 10.2. Cell
- 10.3. Lead-Acid Cell Construction
- 10.4. Applications of Lead-Acid Cells
- 10.5. Care and Maintenance of Cells
- 10.6. Charging and discharging of Batteries.

RURAL ENGINEERING TECHNOLOGY- Ist YEAR
WORKSHOP PRACTICE
PRACTICAL - PAPER - I

Sl.No.	Major Topics	No.of Periods
1.	Fitting	40
2.	Carpentary	24
3.	Black Smithy	28
4.	Tin Smithy	24
5.	Welding	28
6.	Plumbing	16
	Total	160

**RURAL ENGINEERING TECHNICIAN
FIRST YEAR
PRACTICAL-1- PAPER-I
SUBJECT: WORKSHOP PRACTICE**

Detailed Syllabus:

1. Fitting

- 1.1. Identification & Usage of tools
- 1.2. Sawing Practice
- 1.3. Filing practice
- 1.4. Chiselling Practice
- 1.5. Preparation of T, 'L' Sections
- 1.6. Drilling
- 1.7. Tapping

2. Carpentry

- 2.1 Planning practice
- 2.2 Chiselling practice
- 2.3. Prepare Tee Lap joint
- 2.4. Plain Tenon joint
- 2.5. Mortise & Tenon joint
- 2.6. Boring Practice

3. Black Smithy

- 3.1. Practicing of usage of tools
- 3.2. Making a round bar from a square bar
- 3.3. Making a ring of given round rod
- 3.4. Making of crane hook, S-hook, T-bolt, Flat Chisel, Gib head sunk key

4. Tin Smithy

- 4.1. Make a Rectangular tray
- 4.2. Make a Rectangulara Scoop, Funnel
- 4.3. Rivettingpractice
- 4.4. Soldering the joints
- 4.5. Elbow

5. Welding : a) Arc welding

- 5.1. Make a square butt joint
- 5.2. Making of T joint, lap joint, corner joint
- 5.3. Identification of welding positions

b) Gas welding

- 5.4. Identification of Gas welding equipment
- 5.5. Setting of Gas welding equipment
- 5.6. Setting of Gas welding flames
- 5.7. Practicing of Gas welding techniques

6. Plumbing

- 6.1. Practicing of erection of pipeline
- 6.2. Threading practice
- 6.3. Fitting of elbow, bend, collar, flange
- 6.4. Joining a nipple
- 6.5. Pipe fittings....'T' joint, reducer, plug arrangement
- 6.6. Screwed joint
- 6.7. Fitting of Taps, valves etc.,

**RURAL ENGINEERING TECHNICIAN - FIRST YEAR
ENGINEERING DRAWING
PRACTICAL PAPER - II**

Chapter 1 : Introduction

- 1.2. Importance of Engineering Drawing
- 1.3. Description of Drawing instruments

Chapter 2 : Free hand letter writing

- 2.1. Free hand letter writing and Numbers Dimension
- 2.2. Different Types of lines and their use, standard practice of writing single stroke
- 2.3. Capital and Small letters and Numericals

Chapter 3 : Geometrical construction

- 3.1. Division of a line in to equal parts
- 3.2. Construction of regular of polygon
- 3.3. Constuction of ellipse, Parabola and Hyberbola.

Chapter 4 : Orthographic Projections

- 4.1. Different angle methods of projection
- 4.2. Concept of plan, elevation and sideview
- 4.3. Orthographic projections of Triangle, Square, pentagon and Hexagon Prisms and Pyramids, Circles, Cube, Cylinder, cone and different Engineering objects in Ist Angle.

Chapter 5 : Sectional views

- 5.1. Need for drawing sectional views
- 5.2. Location of cutting plane
- 5.3. Meaning of Full, Half, Revolved, Local or partial sections
- 5.4. Hatching
- 5.5. Conventional practices to represent the sections of Ribs, Shafts, bolts, nuts, screws, rivets, spokes, webs, keys, cotters, thin sections etc as per B.I.S. specifications.

Chapter 6 : Pictorial Drawings

- 6.1. Brief Discription of Isometric, oblique and perspective drawings and uses.
- 6.2. Isometric drawing of common features like Rectangles, Circular shapes non-sometric lines
- 6.3. Use of box and offset construction.
- 6.4. Prepare isometric projections for the give Orthographic drawings
- 6.5. Oblique drawing of common feature like rectangular, circular and inclined surfaces.

Chapter 7 : Development of Surfaces

- 7.1. Need for preparing development of Surfaces with reference to sheet metal work.
- 7.2. Development of simple Engineering objects like cubes, prisms cylinders, cones, pyramid.
- 7.3. Parallel line and Radial line developments
- 7.4. Procedure of drawing development Drawings of Trays, funnels, 90° elbow pipes and Rectangual Ducts.

**RURAL ENGINEERING TECHNOLOGY - FIRST YEAR
ELECTRICAL ENGINEERING LAB & COMPUTERS LAB
PRACTICAL PAPER - III**

Sl.No.	Major Topics	No.of Periods
1.	A.C.Circuits	20
2.	D.C. Circuits	20
3.	D.C. Machines	25
4.	Battery	10
5.	Wiring	40
6.	Overhaul the appliances	20
7.	Windows-98 operating system	15
8.	MS Office	15
	Total	160

**RURAL ENGINEERING TECHNOLOGY - FIRST YEAR
ELECTRICAL ENGINEERING LAB & COMPUTERS LAB
PRACTICAL PAPER - III**

A. Electrical Engineering Lab

1. A.C. Circuits

- 1.1. Determination of voltage & current in series
- 1.2. Determination of voltage & current in parallel
- 1.3. Calibration of single phase energy meter

2.2. D.C. Circuits

- 2.1. Verify the Ohm's Law
- 2.2. Practice the Ammeter, Voltmeter
- 2.3. Practice the Multimeter - Finding Resistance
- 2.4. Practice on Rheostat

3. D.C. Machines

- 3.1. Identify the components in a D.C. Motor
- 3.2. Identify the components in a D.C. Motor
- 3.3. Practice a D.C. machine

4. Battery

- 4.1. Charging procedure of battery
- 4.2. Discharging position of battery-reactions

5. Wiring

- 5.1. Connect one lamp from two different places in stair case wiring
- 5.2. Practice conduit wiring
- 5.3. Setting of fuse
- 5.4. Connect the fluorescent lamp
- 5.5. Earthing practice

6. Overhauling the Appliances

- 6.1. Overhaul an Electric Iron
- 6.2. Overhaul a ceiling fan

B. Computer Fundamental Lab

WINDOWS-98 OPERATING SYSTEM (15 Periods)

Chapter-1 : Introduction to Window-98

Features of Window-98

1. Graphical user interface (GUI)
2. Graphics Manipulation
 - 32-Bit File System
 - Multitasking
 - System Robustness
 - Long File Names
 - Plug and Play Support
 - Multimedia Support
 - Object Linking and Embedding (OLE)
 - Comparison with CUI (Dos or Unix)

Starting Windows-98

Elements of Windows-98 Interfasce

- My Computer
- My Documents
- Internet Explorer
- Network Neighbourhood
- Recycle Bin
- Taskbar
- My Briefcase
- Channel Bar
- Desktop Toolbar
- Shortcut Menus
- Property Sheets

Mouse Operation

- Dragging the Items with Mouse
- Activating Shortcut Menus

Starting a Program (Application)

- Start Menu
- Programs Menu
- Documents Menu
- Settings Menu
- Find and Help Menu
- Run Dialog
- Shutdown Dialog
- Log-Off Dialog

Windows Manipulation

Customising Windows

- Minimising a Window
- Enlarging a Minimised Window
- Maximising a Window
- Manually Resizing a Window
- Moving a Window
- Closing a Window
- Dialog Box & its Elements
 - 1. Check Boxes
 - 2. Radio Button
 - 3. Cosbo Box etc.

Shutting Down the PC

- Stand By
- Shut Down
- Restart in Ms. Dos Mode
- Restart
- Log Off Windows
- Log on as a Different User

Chapter-II : Managing Files and Folders

working in Windows-98

- Folders
- Desktop
- My Computer Folder
- My Document Folder
- Notepad

Creating Text Files

Editing Text Files

All the Menu Features of Notepad

Renaming the Folders

Selecting the Objects in Folders

Selecting One Folder

Boundary Box Method to Select Multiple Files

Selecting Single Group of Consecutive Folders

Selecting Non-Consecutive Folders

Selecting Group of Consecutive Folders

Deleting Files and Folders

Using Recycle-Bin

Restoring Deleted File or Folder

Emptying the Recycle Bin

Opening Multiple Objects :

Open Multiple Objects

Open Multiple Applications using the Mouse

Creating our Own Folder

Copying Objects

Drag and Drop Feature

Using Keyboard

Using Standard Toolbar

Right Dragging Method

Moving Objects

Drag and Drop Feature

Using Keyboard

Using Standard Toolbar

Right Dragging Method

Configuring Win-98 for unique user and Desktop:

Managing Passwords

Setting Programs

Starting Programs on Start-up Menu

Changing the Icon for File Tag or Other Object

- Control Panel
- Setting Mouse Properties
- Setting Display Properties
- Setting Printer Properties
- Setting Date and Time Options
- Controlling the Folders Appearance
- Setting the Font Appearance
- Using the Task Bar
- Features of Taskbar
- Setting the Properties of Taskbar

Dest Top

- Features of Desk Top
- Customising the Desk Top

Windows Explorer

- Viewing Files and Folders
- Creating Files and Folders
- Dragging and Dropping Files
- Cut-Copy-Paste
- Searching Files
- Deleting Files and Folders
- Previewing a Document with Quick View

Chapter-3 : USING ACCESSORIES, DISK TOOLS AND PRINTERS

Assessories available in Windows:

- Using Standard Calculator
- Using Scientific Calculator
- Statistics Box
- Word Pad
- Starting Word-Pad
- Creating New Wordpad Document
- Opening Wordpad Document
- Saving a Document
- Selecting Text
- Moving and Copying Text

Drawing Pictures with Paint

- Starting Windows Paint
- Drawing with Pencil Tool
- Drawing the Picture With Tools
- Embedding a Paint Object
- Linking a Paint Object
- Previewing Painting

LOCATING YOUR FILES AND ORGANISING DISK:

- Finding Files using File Tool
- Using Wild-Cards
- Finding a Program-File
- Searching by Modification Date
- Making a Search Case-Sensitive
- Formatting and Labelling Disks
- Back-up Files
- Creating Back-Up File
- Saving File Set
- Opening File-Set for using in Back-Up
- Restoring Files
- Verifying Back-Up Files

Using Printers

- Windows-98 Printing Features
- Spoiled Printing

Printing from Windows-Applications

- Printing a Document
- Printing Multiple Copies
- Printing From Desktop
- Printing from Context Menu
- Printing with Drag and Drop
- Printing with Send to
- Printing from a Folder

VERSIONS OF WINDOWS OPERATING SYSTEMS:

- Features of Different Versions
- Comparison of Windows-98 with other Versions.

MS-OFFICE (15 Periods)

1. Introduction to Ms-Office

MS-WORD

1. Introduction to Word Processing
2. Features of Word Processor
3. Getting Started with Ms-Word
4. Contents of Ms-Word Window
5. Working with Word Documents
 - Creating A Document
 - Moving around the Document
 - Closing a Document

6. Opening an Existing Document

- Getting around the Document
- Changing the Views
 - Normal View
 - Online Layout View
 - Page Layout View
 - Out Line View
 - Mater Document View
 - Splitting the Screens
 - Zooming and View
 - Tool Bars

7. Formating the Document

- Selecting Text
- Editing Text
- Deleting
- Moving or Copying
- Drag and Drop Feature
- Formating Characters
- Changing Case
- Paragraph Formating
- Text Alignment

- Spacing
- Indents
- Page Formatting
- Changing the Paper Size
- Page Margins
- Header and Footer
- Numbering Pages
- Page Breakes
- Bullets and Numbering
- Borders and Shading
- Drop Caping
- Columns
- Inserting Menu

8. Spelling And Grammer

9. Editing and Proffing the Text

- Spell Check
- Checking Grammer
- Thesaures
- 10. Mail Merging
- 11. Tables
- 12. Working with Window
- 13. Help
- 14. Quitting MS Word
- 15. Short Cut Keys

RURAL ENGINEERING TECHNICIAN - I IINDYEAR
NON-CONVENTIONAL ENERGY SOURCES
THEORY - PAPER - I

Sl. No.	Major Topics	No.of Periods	Weightage Marks
1.	Energy Sources	10	04
2.	Solar Energy	48	20
3.	Wind Energy	10	08
4.	Bio-Energy	60	20
5.	Tidal Energy	16	08
6.	Fuel Cells	16	08
	Total	160	68

RURAL ENGINEERING TECHNICIAN - I IINDYEAR
NON-CONVENTIONAL ENERGY SOURCES
THEORY - PAPER - I Detailed Syllabus :

1.0. Energy Sources

- 1.1. Introduction to Energy
- 1.2. Different forms of Energy
- 1.3. Energy Sources and their availability
- 1.4. Conventional and Non-Conventional sources of energy

2.0. Solar Energy

- 2.1. Introduction
- 2.2. Solar Constant
- 2.3. Solar Radiation at the Earth's Surface
- 2.4. Instruments for measuring Solar Radiation and Sun shine
- 2.5. Solar Energy Utilisation - Basic ideas about the pre-historic ways of using solar energy,
- 2.6. Solar energy applications - solar collectors, solar cooker, solar water heater, solar distillation, solar pumping, electricity from solar energy, solar photo voltaics, applications of solar photo voltaic system in Rural areas

3.0. Wind Energy

- 3.1. Introduction
- 3.2. Classification of wind mills
- 3.3. Horizontal wind mills, Vertical wind mills
- 3.4. Advantages and Disadvantages of wind energy

4.0. Bio Energy

- 4.1. Introduction, History of Bio-gas
- 4.2. Process of Bio-gas, generation - wet process, dry process,
- 4.3. Raw materials available for Bio-gas fermentation,
- 4.4. Selecting of site for installation of a Bio-gas plant

- 4.5. Materials required for the construction of Bio-gas plant
- 4.6. Constructional Details of Bio-gas plant
- 4.7. Utilization and benefits of Bio-gas Technology
- 4.8. Common operational problems
- 4.9. Economical, Social Environmental and Health Benefits of Bio-gas utilization
- 4.10. KVIC Bio gas plant, Pragati Bio gas plant, Janata Bio-gas plant, Deenabandhu Bio-gas plant

5.0. Tidal Energy

- 5.1. Introduction
- 5.2. Components of Tidal Power Plant
- 5.3. Sinds tidal power plant
- 5.4. Advantages and Limitations of Tidal Power Plant.

6.0. Fuel Cells

- 6.1. Working principle
- 6.2. Bacon's High Pressure Fuel cell - construction details and working principle
- 6.3. Types of fuel used
- 6.4. Aluminium and fuel cell working principle

RURAL ENGINEERING TECHNICIAN - I IIND YEAR
FARM EQUIPMENT AND TRACTORS
THEORY PAPER-II

Sl. No.	Major Topics	No.of Periods	Weightage Marks
1	Tractors	06	02
2	Engine components	26	08
3	Engine Systems	28	08
4	Transmission	10	06
5	Steering	12	05
6	Hydraulic system	08	05
7	Tillage	20	08
8	Secondary tillage implements	08	08
9	Seeding machinery	18	08
10	Harvesting & Threshing equipment	10	05
11	Plant protection equipment	14	05
	Total	160	68

**RURAL ENGINEERING TECHNICIAN - IIND YEAR
FARM EQUIPMENT AND TRACTORS
THEORY PAPER-II**

Detailed Syllabus :

1.0. Tractors

- 1.1. Introduction
- 1.2. Types in Tractors
- 1.3. Main assemblies in tractor
- 1.4. Technical terms

2.0. Engine Components

- 2.1. Main components
- 2.2. Crank case
- 2.3. Cylinder head
- 2.4. Types of cylinder head
- 2.5. Piston
- 2.6. Functions of piston
- 2.7. Parts of piston
- 2.8. Piston rings
- 2.9. Connecting Rods
- 2.10. Main parts of crank shaft
- 2.11. Cam shaft
- 2.12. Fly wheel
- 2.13. Gudgeon pin
- 2.14. Engine valves
- 2.15. Valve lifting mechanism
- 2.16. Valve trouble shooting
- 2.17. Valve timing diagram

3.0. Engine systems

- 3.1. Ignition system
- 3.2. Battery Ignition system
- 3.3. Condenser
- 3.4. Fuel Injection system
- 3.5. Types of Injection systems
- 3.6. Fuel Injection pump
- 3.7. Components of Injection pump
- 3.8. Governor
- 3.9. Types of Governors
- 3.10. Intake and Exhaust systems
- 3.11. Cooling system
- 3.12. Types of cooling systems
- 3.13. Thermo syphon system
- 3.14. Pump circulation system
- 3.15. Thermo stat
- 3.16. Lubrication system
- 3.17. Importance
- 3.18. Types in lubrication system

4.0. Transmission

- 4.1. Introduction
- 4.2. Powertrains
- 4.3. Clutch
- 4.4. Classification
- 4.5. Transmission box
- 4.6. Differential
- 4.7. Final drive

5.0. Steering

- 5.1. Introduction
- 5.2. Components of steering system
- 5.3. Types of steering system
- 5.4. Front axle
- 5.5. Live axle - Dead axle
- 5.6. Brake
- 5.7. Importance of brake
- 5.8. Mechanical brake

6.0. Hydraulic System

- 6.1. Advantages of hydraulic system
- 6.2. Main components of hydraulic system

7.0. Tillage

- 7.1. Concept of farm equipment
- 7.2. Objectives of tillage
- 7.3. Classification of tillage
- 7.4. Primary tillage implements
- 7.5. Types of ploughs
- 7.6. Constructional details of Indegenous plough
- 7.7. Soil turning ploughs
- 7.8. Construction of M.B. plough
- 7.9. Working of M.B. plough
- 7.10. Accessories of M.B. plough
- 7.11. Disc plough
- 7.12. Advantages of Disc plough
- 7.13. Disc Angles

8.0. Secondary tillage implements

- 8.1. Types of tillage implements
- 8.2. Working of Harrows
- 8.3. Use of pulverizer, cultivator
- 8.4. Working of Guntaka, Bund former

9.0. Seeding machinery :

- 9.1. Sowing
- 9.2. Sowing methods
- 9.3. Seed drill
- 9.4. Functions of seed drill
- 9.5. Components of seed drill
- 9.6. Types of furrow openers
- 9.7. Calibration of seed drill
- 9.8. Planters
- 9.9. Functions of planters
- 9.10. Components of planter
- 9.11. Working of potato planter
- 9.12. Sugar cane planter

10.0. Harvesting and Threshing equipment

- 10.1. Harvesting
- 10.2. Mower
- 10.3. Components of Mower
- 10.4. Working of mower
- 10.5. Harvesting devices for root crops
- 10.6. Threshing
- 10.7. Methods of threshing
- 10.8. Winnowing

11.0. Plant Protection equipment

- 11.1. Introduction
- 11.2. Sprayers
- 11.3. Types of sprayers
- 11.4. Stirrup pump sprayer
- 11.5. Knap sack sprayer
- 11.6. Foot sprayer
- 11.7. Power sprayer
- 11.8. Duster
- 11.9. Importance of duster
- 11.10. Rotary duster

RURAL ENGINEERING TECHNICIAN - I IIND YEAR
DOMESTIC APPLIANCES
THEORY - PAPER III

Sl. No.	Major Topics	No.of Periods	Weightage Marks
1	Refrigerators and Air conditioners	40	14
2	Air Coolers	20	08
3	Washing Machine	20	10
4	Grinder and Mixer	20	10
5	Gas Stove	20	08
6	Petromax light and Gas light	20	10
7	Bicycle	20	08
	Total	160	68

**RURAL ENGINEERING TECHNICIAN - IIND YEAR
FARM EQUIPMENT AND TRACTORS
THEORY PAPER-II**

Detailed Syllabus :

1.0. Refrigerators and Air Conditioners

- 1.1. Introduction
- 1.2. Unit of Refrigeration
- 1.3. Vapour compression Refrigeration
- 1.4. Refrigeration equipments,
 - 1.4.1. Compressors,
 - 1.4.2. Condensers and cooling towers
 - 1.4.3. Evaporators
 - 1.4.4. Expansion devices
- 1.5. Meaning of Air conditioning
 - 1.5.1. Psychrometry and its properties
 - 1.5.2. Dry air
 - 1.5.3. Moist air
 - 1.5.4. Water vapour
 - 1.5.5. Dry bulb temperature
 - 1.5.6. Wet bulb temperature
- 1.6. House hold Refrigerators
- 1.7. Water coolers
- 1.8. Window Air Conditioners
- 1.9. Trouble shooting
- 1.10. Gas charging

2.0. Air Coolers

- 2.1. Introduction
- 2.2. Parts of Air cooler
- 2.3. Types of Air cooler
- 2.4. Trouble shooting of Air cooler.

3.0. Washing Machine

- 3.1. Introduction
- 3.2. Working principle
- 3.3. Study of mechanism
- 3.4. Service and Maintenance
- 3.5. Trouble shooting

4.0. Grinder and Mixer

- 4.1. Introduction
- 4.2. Working principle
- 4.3. Study of mechanism
- 4.4. Service and maintenance
- 4.5. Trouble shooting

5.0. Gas Stove

- 5.1. Introduction
- 5.2. Principle of Working
- 5.3. Study of Mechanism
- 5.4. Service and Maintenance
- 5.5. Trouble shooting

6.0. Petromax light and Gas light

- 6.1. Introduction
- 6.2. Principle of working
- 6.3. Study of mechanism
- 6.4. Service and maintenance
- 6.5. Trouble shooting

7.0. Bicycle

- 7.1. Introduction
- 7.2. Study of Mechanism
- 7.3. Trouble shooting
- 7.4. Reparis and maintenance

**RURAL ENGINEERING TECHNICIAN - I IIND YEAR
NON-CONVENTIONAL ENERGY SOURCES LAB
PRACTICAL - PAPER - I**

Sl.No.	Major Topics	No.of Periods
1	Solar Radiation measurement	15
2	Solar distillation	15
3	Solar pumping	15
4	Solar cooker	15
5	Solar water heater	15
6	Solar lanterns and street light	15
7	BIO gas plant	40
8	Wind Energy	15
9	Fuel cells	15
	Total	160

RURAL ENGINEERING TECHNICIAN - I IINDYEAR
NON-CONVENTIONAL ENERGY SOURCES LAB
PRACTICAL - PAPER - I

Detailed Syllabus :

1.0. Solar Radiation Measurement

- 1.1. Study of Solar Radiation by using pyramometer – Aim, Apparatus, Procedure

2.0. Solar Distillation

- 2.1. Study of solar distillation – Aim, Apparatus, procedure

3.0. Solar pumping

- 3.1. Study of Solar water pumping – Aim, Apparatus, procedure

4.0. Solar cooker

- 4.1. Prepare delicious food by using solar cooker – Aim, Apparatus, Ingredients, procedure
- 4.2. Dismantling and Assembling of a solar cooker – Aim, Apparatus, Tools required, procedure

5.0. Solar water Heater

- 5.1. Study of Thermosiphon system – Aim, Apparatus, procedure
- 5.2. Study of Forced circulation system – Aim, Apparatus, procedure

6.0. Solar Lanterns and Street light

- 6.1. Study of Solar lanterns – Aim, Apparatus, procedure

7.0. Bio Gas

- 7.1. Study of K.V.I.C. Bio gas plant – Aim, Apparatus, procedure
- 7.2. Study of pragathi Bio gas plant – Aim, Apparatus, procedure
- 7.3. Study of Janata Bio gas plant – Aim, Apparatus, procedure
- 7.4. Study of Deenabandhu Bio gas plant – Aim, Apparatus, procedure

8.0. Wind Energy

- 8.1. Study of Horizontal Wind mill – Aim, Apparatus, procedure

9.0. Fuel Cells

- 9.1. Study of Fuel cells – Aim, Apparatus, procedure

RURAL ENGINEERING TECHNICIAN - IInd YEAR

FARM MECHANERY LAB

PRACTICAL - PAPER - II

Sl.No.	Major Topics	No.of Periods
1.	Tractor	16
2.	Engine	34
3.	Transmission	24
4.	Engine Systems	16
5.	Tractor driving & wheels	20
6.	Primary tillage equipments	24
7.	Secondary tillage equipments	26
	Total	160

RURAL ENGINEERING TECHNICIAN - IInd YEAR
FARM MECHANICRY LAB
PRACTICAL - PAPER - II

Detailed Syllabus :

1.0. Tractor

- 1.1. Identification of various tractors
- 1.2. List of assemblies and technical terms of tractor

2.0. Engine

- 2.1. Dismantle the 4 stroke diesel engine aim, tools & equipment required, procedure, precautions
- 2.2. Trouble shooting in the engine-remedies
- 2.3. Dismantle the 4 stroke petrol engine and identify the components. Aim-tools & equipment required - procedure
- 2.4. Procedure of checking & Tightening of bolts & nuts

3.0. Transmission

- 3.1. Play in the clutch-adjustments, aim, hand tools required, procedure, precautions
- 3.2. Checkup the oil level, battery etc.,

4.0. Engine Systems

- 4.1. Cooling system, trouble shooting - remedies
- 4.2. Steering system, trouble shooting - remedies
- 4.3. Checkup the hydraulic system, tightening the equipments of system

5.0. Tractor Driving & Wheels

- 5.1. Tractor driving & take left turn & right turn operation system
- 5.2. Repairing of Tyre puncture, seperate steel rim & pneumatic tyre, aim, tools & equipment required, procedure, precautions

6.0. Primary Tillage Equipment

- 6.1. Dismantle and identify the components of M.B. plough
- 6.2. Replacement of wornout components in the MB plough
- 6.3. Operation of Indegeneous plough

7.0. Secondary Tillage Implements

- 7.1. Servicing of the cultivator
- 7.2. Dismantle and service the puddler
- 7.3. Setting the components of seed drill, demonstrate operation of seed drill
- 7.4. Adjustments & servicing of bund former

RURAL ENGINEERING TECHNICIAN - IInd YEAR
DOMESTIC APPLIENCES LAB
PRACTICAL - PAPER - III

Sl.No.	Major Topics	No.of Periods
1.	Refrigerators and Air Conditioners	40
2.	Air Coolers	20
3.	Washing Machine	20
4.	Grinder and Mixer	20
5.	Gas Stone	20
6.	Petromax light and Gas light	20
7.	Bicycle	20
	Total	160

RURAL ENGINEERING TECHNICIAN - IInd YEAR
DOMESTIC APPLIENCES LAB
PRACTICAL - PAPER - III

Detailed Syllabus :

1.0. Refrigerators and Air Conditioners

- 1.1. Servicing of a Refrigerator aim, parts of Refrigerator, Tools required, procedure for servicing, Precautions
- 1.2. Servicing of an Air conditioner, Aim, Parts of Refrigerator, Tools required, Procedure for servicing, Precautions

2.0. Air Coolers

- 2.1. Servicing of an Air Cooler, Aim, Parts of Air Cooler, Tools required, Procedure for servicing, Precautions
- 2.2. Replacing mats - Aim, Tools required, procedure for replacing, Precautions
- 2.3. Lubrication of Fan Motor and Pump - Aim, Tools required, Procedure for Lubrication, Precautions

3.0. Washing Machine

- 3.1. Servicing of Washing Machine - Aim, Tools required, Procedure for servicing, Precautions

4.0. Grinder and Mixer

- 4.1. Servicing of Grinding Machine - Aim, Tools required, Procedure for servicing, Precautions

5.0. Gas Stove

- 5.1. Dismantling and Assembling of Gas Stove - Aim, Tools required, Procedure and Precautions

6.0. Petromax Light and Gas Light

- 6.1. Dismantling and Assembling of Petromax Light - Aim, Tools required, Procedure and Precautions
- 6.2. Dismantling and Assembling of Gas Light - Aim, Tools required, Procedure and Precautions

7.0. Bicycle

- 7.1. Servicing and Lubrication of a Bicycle - Aim, Tools required, Procedure and Precautions

**VII. LIST OF EQUIPMENT FOR
RURAL ENGINEERING TECHNICIAN**

A. Name of the Equipment

1. General purpose Lathe
2. Welding Set (Transformer type)
3. Hand Drilling Machine
4. Drilling Machine - Bench Type
5. Grinder (Rough and Smooth)
6. 4 Strokes Diesel Engine

B. Agricultural Tools and Equipment

1. Spades
2. Sickle
3. Rake
4. Hoe
5. Hoe
6. Tine cultivator
7. Bund Former
8. Foot operated Sprayer
9. Rotary duster
10. Desiplough
11. Seed cum Fertiliser drill
12. Cultivator
13. Centrifugal pump with electric motor or prime moner
14. Knap Sack power sprayer with engine
15. Tractor in working condition
16. Power triller
17. Tractor operated reaper
18. Power operated paddy/wheat thresher power tresher for ground nut - Decorticator, power maize skiller combine harvestor.

19. Power Sprayer
20. Pady Sprayer
21. Gas welding equipment
22. Refrigerator
23. Washing Machine
24. Air Cooler

Miscellaneous Tools, Equipment and Furniture

1. Hand Reamers - 1 set
2. Ta and Dies - Complete BSW, Metric - 1 Set each
3. Micrometer outside 25-100 mm
4. Micrometer inside 50-100 mm
5. Extension Rods - 2
6. Vernier Callipers set 300 mm inside/outside - 1 set
7. Straight Snip - 1 No.
8. Safety gaugles - 2 No.
9. Tachnometer - 1 No.
10. Anvil with stand
11. Forge with chimney fitted with blower - 1 No.
12. Chain and pully block - 3 Tons capacity - 1 No.
13. Work Bench - 2.5 x 1.25 x 7.5 meters - 2 Nos.
14. Bench vice - 10 Nos
15. Trays - 4
16. Pipe Wrench - 2 No
17. Allekey - 2 Nos
18. Service equipment kit for I.C.engines - 2 Nos
19. Compressor Unit - 1 No
20. Chair for Lecturers - 2 Nos
21. Metal Racks - 2 Nos
22. Fire Extinguister - 2 Nos
23. Fire Bucketws with hands and stand - 4 Nos.
24. Inspection lamp - 2 Nos

Building Tools

1. Soldering Iron - 120 watts
2. Spanner Socket - 2 sets
3. Infector Testing Set - No
4. Cylinder gange (Cop-6.1) - 1 No
5. Spray gun set - 1 No
6. Puncture equipment - 1 set
7. Ring Expander and Remover - 1 No
8. Ring groove cleaner - 1000
9. Fedar gange - 1 No
10. Infector cleaning kit - 1 No
11. Triangular, Half Round, Flat Files - (25 cm) - 4 each

Hand Tools

1. Ball peen hammer - (7.5 kg, 5 kg, 2.5 kg) - 2 each
2. Plastic Hammers - 5 Nos
3. Wooden Mallet - 1 No
4. Chisel - Flat 20mm - 5 Nos
5. Half Round Chisel - 5 Nos
6. Centre punch - 10 mm - 10 Nos
7. Hallow punch - 1 set
8. letter punch - 1 set
9. Screw drivers - 10 Nos
10. Callipers - all types - 1 set each
11. Steel Rules - 10 Nos
12. Hand Files - 2nd Cut - 10 Nos
13. Cutting pliers - 10 Nos
14. All Types of Files - each type - 5 Nos
15. Dividers - 4 Nos
16. Ring Spanner Sets - 2 Sets

17. Adjustable spanner - 15 cm 2 Nos
18. Twist drills - 3 mm - 12 mm - 2 sets
19. Tongs Flat and Round - 2 Nos each
20. Refrigerator Servicing Tools
 - 20.1. Flaring Yoke
 - 20.2. Flaring Block
 - 20.3. Tube Bender
 - 20.4. Brazing set
 - 20.5. Gas Charging Cylinders
 - 20.6. Charging Tubes
 - 20.7. Pinching Tool
 - 20.8. Tube Cutter
 - 20.9. Vacuum Pump
 - 20.10. Blower

**VIII. (A) COLLABORATING INSTITUTIONS/DEPARTMENTS FOR
CONDUCT OF ON THE JOB TRAINING**

1. Krishivigyan Kendras
2. Department of Renewable Energy
3. ICAR Engineering Institution
4. Agricultural University
5. Tractor Industry
6. Rural Development Agencies
7. Refrigeration and Air-conditioning Industry
8. Rural Water Supply Boards
9. Departments of Irrigation
10. Local Farm machinery equipment, manufacturing firm
11. Local Agricultural Farm

VIII(B). ON JOB TRAINING, SYLLABUS AND EVALUTION

FIRST YEAR

- 1st Week : Working on I.C. engines (Petrol, Diesel) (2 Stroke, 4 Storkes) — 55 periods & 14 marks
- 2nd Week : General Engineering works like Drilling, Welding, Fitting and Grinding - 55 periods, 14 marks
- 3rd Week : Electrical Works & Batteries Servicing - 12 marks, 50 periods
- 4th Week : Working with pumps and motors - 50 periods, 10 marks

SECOND YEAR

- 1st Week : Study of Solar pannel and working and maintainance of pannel boards and working on Bio-gas plants - 60 periods, 15 marks
- 2nd Week : Refrigerator Servicing and Repairs
- 3rd Week : Air Coolers servicing and Repairs washing machine servicing and repairs - 90 periods, 20 marks
- 4th Week : Servicing and maintenance of Different Tractors and power Trillers - 60 periods, 15 marks

FORM OJT – 5

EMPLOYER'S CERTIFICATE

(Name and Address of Industry)

This is to certify that Mr/Miss _____
S/o / D/o _____ of Vocational Institution / School
_____ attended On the Job Training [OJT]
Programme from _____ to _____ in this organization
on _____.

During this period he/she has successfully completed the
training programme.

His/Her specific work areas of training are the follows:

- 1.
- 2.
- 3.
- 4 .

Signatures :In-Plant Supervisor : _____

Teacher Co-ordinator : _____

Principal : _____

FORM OJT – 6

CUMULATIVE PROGRESS CHART

(One Sheet for every student to be maintained
by the Faculty Member)

Name _____ Course _____ Year _____

Name of the Institution _____

Evaluation Report

Sl.No.	Job Skills	Maximum Marks	Marks awarded
1.	Adopting correct postures	5	
2.	Methods and techniques used	5	
3.	Enthusiasm for learning	5	
4.	Organizing work practice	5	
5.	Presentation of work	5	
6.	Co-operation with fellow workers	5	
7.	Observation of time schedule	5	
8.	Handling of tools and equipments	5	
9.	Proficiency in terms of productivity	5	
10.	Know-how of tools and raw materials	5	
	TOTAL	50	

Signature of the Faculty Member

IX. TEACHING STAFF AND THEIR QUALIFICATION

1. Vocational Lecturer (Full Time) — 3

Qualifications :

Degree in Mechanical / Agricultural Engineering

(OR)

Diploma in Mechanical / Agriculture Engineering with two years experience

2. Vocational Instructor / Sr. Instructor (Part-time) — 1

Qualifications :

Diploma in Mechanical (OR) Technical Trained field expert

(OR) R.E.T. passout with one year experience.

3. Vocational Lab Assistant — 1

Qualifications :

R.E.T. passout (OR) S.S.C with concerned field experience

X. VERTICAL MOBILITY

1. The Intermediate Vocational course Rural Engineering Technician passouts can be admitted into degree like BA/B.Com/B.Sc/BCA/BBM Courses
2. Rural Engineering Technician passouts with Bridge Course can directly admit into second year Diploma Mechanical/Automobile/Agriculture Engineering or Degree in Engineering / and join in any Engineering Course through EAMCET

XI. REFERENCE BOOKS

I Year

1. Workshop Technology
 - 1.1. Elements of Workshop Technology - Hazara Chowdary
 - Workshop Technology - Shalihabibulla
2. Mechanical Technology
 - 2.1. Mechanical Technology - R.S. Kurmi
 - 2.2. Mechanical Technology - K. Venkateswarlu
 - 2.3. Pump Operation and Maintanance - Tata Mc.Graw Hill
 - 2.4. Pumps - Jagatheesh
3. Electricald Technology
 - 3.1. Electricald Technology - B.L. Theraja
 - 3.2. Electrical Domestic Appliances - Shali Habibulla

II Year

1. Non-Conventional Energy Sources
 - 1.1. Solar Energy - G.D. Rai
 - 1.2. Solar Energy - S.P. Sukhatme
 - 1.3. Solar Energy - Shali Habibulla
 - 1.4. Bio-gas Technology - A.N. Mattur
 - 1.5. Bio-gas Technology - Shali Habibulla
2. Farm Equipment and Tractors
 - 2.1. Farm Equipment - S.C. Jain
 - 2.2. Farm Equipment - Shali Habibulla
 - 2.3. Tractor Mechanism - Jain Raj Tata Mc. Graw Hill
3. Domestic Appliances
 - 3.1. Domestic Appliances - Shali Habibulla
 - 3.2. Refrigeration and Air Conditioning - S. Dom Kundwar
 - 3.3. Refrigeration Repairing - Shali Habibulla

XII. MODEL QUESTION PAPER
COURSE : RURAL ENGINEERING TECHNICIAN
SUBJECT : WORK SHOP TECHNOLOGY
FIRST YEAR PAPER-I

Time : 3 Hours

Max. Marks : 50

Section - A

Note : (i) Answer all the Questions 10 x 2 = 20
(ii) Each Question carries 2 marks

1. What are the Ferrous and Non-Ferrous metals?
2. What are the comon tools used in fitting section?
3. Mention the parts of clisel and hammer?
4. What are the common tools used in smithy?
5. What is meant by extrusion.
6. what are the safety precautions to be followed while practicing are welding?
7. What are the marking and measuring tools used in carpentry?
8. What is the use of Drilling machine and name its parts?
9. What are the materials used for making a grinding wheel?
10. What are the parts of a Lathe?

Section - B

Note : (i) Answer any 5 Questions 5 x 6 = 30
(ii) Each Question carries 6 marks

11. What are the general safety precautions to be taken for preventing accidents?
12. Sketch and explian briefly about any two types of marking tools used in fitting?
13. Write briefly about soldering and brazing work used in sheet metal?

14. Write a short note on smithly forge (or) Hearth and Anvil?

15. Explain briefly about elecric are welding with the help of a neat sketch?
16. Explain briefly any two types of cutting tools used in carperntary?
17. Explain with help of a neat sketch?
18. Explain briefly about oxy-accetylene flames with sketches?

MODEL QUESTION PAPER
COURSE : RURAL ENGINEERING TECHNICIAN
SUBJECT : MECHANICAL TECHNOLOGY
FIRST YEAR PAPER-II

Time : 3 Hours

Max. Marks : 50

Section - A

Note : (i) Answer all the Questions 10 x 2 = 20
(ii) Each Question carries 2 marks

1. Define Thermodynamic System?
2. State Boyles Law?
3. What are the different types of Thermodynamic Processes?
4. What is meant by the term fuel and what are its constituents?
5. Mention the different types of solid, liquid and gaseous fuels?
6. Define Heat Engine?
7. Mention the parts of Diesel engine?
8. What are the functions of a pump?
9. What are the components of a sprinkler?
10. What are the main parts of Reciprocating and submersible pumps?

Section - B

Note : (i) Answer any 5 Questions 5 x 6 = 30
(ii) Each Question carries 6 marks

11. Explain briefly about the types of Thermodynamic Systems?
12. Define the terms Pressure, Atmospheric Pressure, Temperature, and Enthalpy?
13. State Charle's Law, Avagadro's Law and Joule's Law?
14. State Laws of Thermodynamics?
15. Derive an expression for the work done during the constant volume process?

16. Give a brief account on different types of solid fuels?
17. Explain the working principle of a four stroke petrol engine?
18. Explain the working of contrigugal pumps with the help of a neat sketch?

MODEL QUESTION PAPER
COURSE : RURAL ENGINEERING TECHNICIAN
SUBJECT : ELECTRICAL TECHNOLOGY
FIRST YEAR PAPER - III

No. of Questions : 18

Time : 3 Hours

Max. Marks : 50

Section - A

Note : (i) Answer all the Questions 10 x 2 = 20
(ii) Each Question carries 2 marks

1. Name hand tools used for electrical work
2. Define Ohm's Law?
3. What is Electrical Power?
4. What is Semi Conductor?
5. Name some types of switches
6. What is Flux density?
7. What is Electro magnetic Induction?
8. List out main componenets in Generator
9. What is the use of Geysers
10. Write two differences between primary and Secondary Cell

Section - B

Note : (i) Answer any five Questions 5 x 6 = 30
(ii) Each Question carries 6 marks

11. a) Define Kirchhoff's Laws
b) Define laws of Resistance
12. In an Electrical Installation 16 tube lights of 40 w each, 12 fans

60w each works for 12 hours/day. 1 HP Motor pump set works for 5 hours/day. 100w light 6 No's each works for 5 hours/day. Calculate Electric bill for the installation per month @ Rs.1.50/- BOT Unit. Add Rs.5/- for meter rent for month

13. List out and mention the uses of important electrical accessories
14.
 - a) How the magnetic field created around a current carrying conductor?
 - b) Compare electric circuit with a magnetic circuit
15. Classify and explain the inductance
16. Explain working of D.C.Motor with a Sketch
17. Explain working of Electric Iron with a Circuit diagram
18. Briefly explain about lead-acid battery

MODEL QUESTION PAPER
COURSE : RURAL ENGINEERING TECHNICIAN
SUBJECT : NON-CONVENTIONAL ENERGY SOURCES
SECOND YEAR PAPER - I

No. of Questions : 18

Time : 3 Hours

Max. Marks : 50

Section - A

Note : (i) Answer all the Questions 10 x 2 = 20
(ii) Each Question carries 2 marks

1. What are the different forms of Energy?
2. What are the conventional and Non-conventional sources of Energy?
3. What is Global radiation?
4. What are the basic components of Solar Water Pumping?
5. Define Solar Collector and give examples?
6. How the wind mills are classified?
7. What are the raw materials required for Biogas generation?
8. Mention the parts of Bio gas plant?
9. What are the different fuels used in fuel cells?
10. What are the basic components of Tidal Power Plant?

Section - B

Note : (i) Answer any 5 Questions 5 x 6 = 30
(ii) Each Question carries 6 marks

11. What are the conventional sources of Energy and explain briefly?
12. Explain Pyranometer with the help of neat sketch?
13. Explain briefly about solar water pumping with the help of a neat sketch?
14. Explain any one of the solar collectors with the aid of neat sketch?

15. Explain constructional details of a box type solar cooker?
16. Explain briefly about horizontal wind mill?
17. Explain briefly about K.V.I.C. Biogas plant?
18. Explain briefly about the constructional details of Fuel Cell?

MODEL QUESTION PAPER
COURSE : RURAL ENGINEERING TECHNICIAN
SUBJECT : FARM EQUIPMENT & TRACTORS
SECOND YEAR PAPER-II

No. of Questions : 18

Time : 3 Hours

Max. Marks : 50

Section - A

Note : (i) Answer all the Questions 10 x 2 = 20
(ii) Each Question carries 2 marks

1. List out main assemblies in a tractor
2. What are the function of piston?
3. What is the importance of lubrication in engine?
4. What are the power trains?
5. How steering wheel is arranged?
6. What are the objectives of tillage?
7. How do you classify the tillage implements?
8. Listout sowing methods?
9. What is meant by winnowing?
10. What is the difference between sprayer and duster?

Section - B

Note : (i) Answer any five Questions 5 x 6 = 30
(ii) Each Question carries 6 marks

11. Describe working of crank shaft with a neat sketch
12. Describe the working of Mechanical Governor with a neat sketch
13. Explain with a neat sketch about constant mesh Gear box.
14. a) What are the advantages of Hydraulic System?
b) What is the importance of steering System?
15. Explain construction of Mould Board plough with a neat sketch?
16. Describe animal drawn seed drill.
17. Describe the construction and working of mower
18. Explain working of power sprayer with a neat sketch

MODEL QUESTION PAPER
COURSE : RURAL ENGINEERING TECHNICIAN
SUBJECT : DOMESTIC APPLIANCES
SECOND YEAR PAPER - III

No. of Questions : 18

Time : 3 Hours

Max. Marks : 50

Section - A

Note : (i) Answer all the Questions 10 x 2 = 20
(ii) Each Question carries 2 marks

1. Define Refrigeration?
2. What are the different types of compressors and condensers used in vapour Compression Refrigeration System?
3. Define Dry bulb and wet bulb temperature?
4. What are the parts of a Refrigerator?
5. What are the main parts of an Air Cooler?
6. What are the main parts of a Washing Machine?
7. What are the main parts of Grinder and Mixer?
8. What are the main parts of Gas stove?
9. What are the main parts of petromax light and Gas light?
10. What is the use of handle and brakes in a Bicycle?

Section - B

Note : (i) Answer any 5 Questions 5 x 6 = 30
(ii) Each Question carries 6 marks

11. Explain vapour compression Refrigeration cycle with the help of a neat sketch?
12. Explain briefly about psychrometric properties?
13. Explain briefly about an Air Cooler with the help of a sketch?
14. How does washing machine works? Explain with neat sketch?

15. Explain briefly about the parts of wet grinder with the help of a neat sketch?
16. Explain briefly about the parts of a mixy with the help of neat sketch?
17. Write the trouble shooting chart of a gas stove?
18. Explain the construction and working of a bicycle?

XII. LIST OF PARTICIPANTS

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VOCATIONAL CURRICULUM-2005
(With effect from the Academic Year 2005-2006)

Curriculum of Intermediate Vocational Course
in

**RURAL
ENGINEERING
TECHNICIAN**



**STATE INSTITUTE OF VOCATIONAL EDUCATION &
BOARD OF INTERMEDIATE EDUCATION A.P.
Nampally, Hyderabad**

FOREWORD

The National Policy on Education (1986) while proposing educational reorganization, placed high priority on the programme of vocationalisation of education. It emphasized that well planned, systematic and rigorously implemented vocational education will create a distinct stream to prepare students for identified occupations encompassing several areas of activity. The primary aim of vocational courses was to cut across several occupational fields and prepare students with employable skills in organized sectors and self employment. Vocationalisation through re-orientation of educational strategies focused on creating a talent pool of skilled youth who are trained in courses relevant to the market and emerging needs of the various sections of the economy.

Inspired by this vision of the National Policy, the Government of Andhra Pradesh introduced Vocational Education at +2 level with an aim to diversify a sizeable segment of students at the senior secondary stage to the world of work. The State Government aimed at reducing the pressures on higher education through empowering youth by harnessing their capabilities. The requirement of skilled manpower industry is being fulfilled by charting a student's career with right options based on aptitude and talent. An right alternative to medical and engineering courses is envisaged in vocationalisation of education in the State.

In view of the changing needs of the students and growing demand for a spectrum of skill competencies in the economy, the Board of Intermediate Education has reviewed the curriculum of Vocational Courses in order to re-orient them based on their viability and practicability. The revised curriculum for Vocational Courses at Intermediate Level will come into effect from the Academic Year 2005-06 1st Year and from Academic Year 2006-07 for 2nd Year students.

I am confident that the revised curriculum will attract more and more students into vocational stream and help them train in need-based, productive courses leading to gainful employment.

SHASHANK GOEL

Secretary, BIE

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