

1	Name of Syllabus	C. C. In Repair & Maintenance & Overhauling of Tractors (306116)												
2	Max. Nos of Student	25 Students												
3	Duration	6 Months												
4	Type	Full Time												
5	Nos Of Days / Week	6 Days												
6	Nos Of Hours /Days	7 Hrs												
7	Space Required	Workshop = 1000 Sq feet Class Room = 200 Sq feet TOTAL = 1200 Sq feet												
8	Entry Qualification	S.S.C.												
9	Objective Of Syllabu introduction	Awareness of Safety precautions Knowledge of Engineering skill, use of tools in Agricultural Machinery. Awareness of Electrical wiring & Electronics. Awareness of Basic Tractor & Power Tillers Awareness of Repair & Maintenance & Overhauling of Tractor.												
10	Employment Opport	The trainee will either to be able to take up jobs with agencies which Maintain Develop and Repair & Maintenance of Harvesting Machines or with working experience will be in a position to start his own independent Business.												
11	Teacher’s Qualificat	Diploma in Mechanical/ Fabrication. With 3 year Teaching experience in Repair & Maintenance & Overhauling of Tractor.												
12	Training System	Training System Per Week <table><tr><td>Theory</td><td>Practical</td><td>Total</td></tr><tr><td>12 Hours</td><td>30 Hours</td><td>42 Hours</td></tr></table>							Theory	Practical	Total	12 Hours	30 Hours	42 Hours
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12 Hours	30 Hours	42 Hours												
13	Exam. System	Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks						
		1	30611611	Repair & Maintenance & Overhauling of Tractor.	TH-I	3 hrs	100	35						
		2	30611621	Tractor, Power Tillers & Post Harvest Technology	PR-I	3 hrs	100	50						
		3	30611622	Repair & Maintenance & Overhauling of Tractor.	PR-II	6 hrs	200	100						
				TOTAL			400	185						

REPAIR & MAINTENANCE & OVERHAULING OF TRACTORS

TOPIC	PRACTICAL- II - Repair & Maintenance & Overhauling of Tractor.	THEORY – I - Repair & Maintenance & Overhauling of Tractor.
Tractor and its systems	Different systems and their functions Parts of system and interconnections Operation of a tractor	Inspection of various system Pre-start and checkup of a tractor
Steering system	Types of steering system Toe in adjustments Methods of repairing	Dismantle and assemble components of steering system Carry out repairs
Brake system	Types of Brakes Components of mechanical, disk & hydraulic brakes Methods of adjustment Procedure of fault finding	Dismantle and assemble different types of brakes Adjust brakes Remove faults in braking system
Clutch	Types of clutches Various parts of a clutch Adjustment of clutch Dismantling and assembly procedure Fault finding techniques	Dismantle and assemble a clutch Finding and remove faults Carry out adjustments of clutch
Gear box	Constructional features Fault identification and method of rectifications	Dismantle and assemble a gear box Identify fault and rectify
Hydraulic system	Principles of operation of hydraulic system Components of hydraulic system Troubleshooting methods	Dismantle and assembly of hydraulic system Carry out adjustment and setting Identify faults and remove them
Differential	Importance of differential	Dismantle a differential
	Functions of different components Final drive, purpose and construction Methods of trouble shooting	Carry out adjustment of clearances and backlashes Assemble a differential
Axle and tyres	Wheel and axle Fitting of cage wheel and adjusting track - width for different operations Toe-in adjustment Repair of tyre and tubes Care and maintenance	Adjust track width, toe-in Carry out ballasting of tyres Repair of tyre and tubes
Electrical system	Care and maintenance of tractor auto-electrical system Methods and techniques used Methods and techniques used	Check battery and carry out maintenance Check and rectify alternator, self- starter, cut -out and other components
Entrepreneurship	Market study Criteria for layout of small and medium level service Center Financial analysis Equipments and tool requirement Requirement for a project proposal	Selection of site for establish the shop Calculate economics of setting a shop Make a list of tools and equipment required for a workshop Draw the layout of shop Prepare a project proposal and safety chart

Engine	Types of engine Technical term used in engine Technical specification of tractor engine Four stroke spark ignition engine Two stroke spark ignition engine	Identify, disassemble and assemble components
Parts of I.C. Engine	Components, main parts its importance and working Overhauling of an Engine.	Adjust & set various parts. Overhaul an Engine
Overhauling & servicing schedule	Importance of overhauling & service schedule Checkup schedule during schedule	

Practical - I - Tractor, Power Tillers & Post Harvest Technology

Topic	Practical- I - Tractor, Power Tillers & Post Harvest Technology
Tractor, Power Tillers & Post Harvest Technology.	Pre-check parts and functions before driving <ul style="list-style-type: none"> • Drive the tractor on different roads and fields with and without implements • Identification of abnormal functioning
	Dismantle and assemble an engine <ul style="list-style-type: none"> • Measure and adjust clearances and tolerances • Overhauling of engine • Test and fine tune the engine • Repair and maintain various systems
	Test the components of a clutch for proper functioning <ul style="list-style-type: none"> • Dismantle and assemble a clutch. • Repair, test and adjust a clutch. • Disassemble and Assemble a gear box • Perform repair, adjustments and maintenance on <ul style="list-style-type: none"> ○ Gear box ○ Steering ○ Brakes
	Operate hydraulic system of tractors <ul style="list-style-type: none"> • Maintenance and repairs hydraulic system • Implement controls
	Drive and handle power tiller with and without implement <ul style="list-style-type: none"> • Repair, maintain and Adjust
	Survey of equipment used locally
	Installation of cleaners and graders <ul style="list-style-type: none"> • Cleaning and grading operations • Identify faults and rectify
	Measurement of moisture contents <ul style="list-style-type: none"> • Practice on dryers
	Handling and identification of parts of flourmill, dal mill, rice mill, huller <ul style="list-style-type: none"> • Adjustments and repairs
	Handling and practice on the equipment <ul style="list-style-type: none"> • Fault identification and removal of faults • Safe operation
	Market survey of storage practices followed
	Pack the given food products and seal
	Instal power threshers <ul style="list-style-type: none"> • Check & adjust Threshing & harvesting machinery • Maintain threshing & harvesting machinery • Change faulty parts and repair threshing & harvesting machinery • Care and maintenance of power threshers • Adjust and operate the reaper under field conditions

SR. No.	Item/ Specification
	Tractor
1.	Trainees Tool Kit
2.	Steel rule 15cm. English and metric
3.	Screw driver 20cm x 9mm. Blade
4.	Screw driver 30 cm X 9mm Blade
5.	Spanner D.E. set of 12 pieces (6mm to 32mm)
6.	Pliers combination 20cm.
7.	Pliers side cutting 15 cm
8.	Pliers round nose 15 cm
9.	Pliers flat nose 15 cm
10.	Hand file 20cm Second cut flat
11.	Hand file 20 cm. Second cut half-round
12.	Hand file 20 cm. Smooth triangular
13.	Hand file 30 cm. Bastard
14.	Hand file 30 cm. Round bastard
15.	Center punch 10 cm.
16.	Chisel cold flat 20 mm.
17.	Feeler gauge 20 blades (metric)
18.	Steel tools box with lock and key (folding type) size 400x200x150 mm
19.	b. Shop outfit & measuring instruments
20.	Hollow punch set of seven pieces 6mm to 15 mm
Sr. No.	Item/ Specification
21.	Drift punch copper 15 cm
22.	Prick punch 15 cm.
23.	Chisels cross cut 200 mmx 6mm
24.	Allen key set of 12 pieces (2mm to 14 mm)
25.	Philips screw driver type set of 5 pieces (100 mm to 300 mm)
26.	Engineer's square 15 cm. Blade
27.	Dividers spring 15 cm.
28.	Ball peen hammer 0.5 kg

29.	Scriber wit scribing black universal
30.	Marking out table 90x60x90 cm.
31.	Hacksaw frame adjustable
32.	Engineers stethoscope
33.	Hand vice 37 mm
34.	Drill Twist (assorted)
35.	Taps and Dies complete sets (5 types)
36.	Hand reamers adjustable 10.5 to 11.25 m, 11.25 to 12.75 mm, 12.75 to 14.25 mm and 14.25 to 15.75 mm
37.	Micrometer outside 0-25 mm, 25-50 mm
38.	Micrometer outside 50 mm to 75 mm and 75 mm to 100 mm.
39.	Mallets wooden/ plastic
40.	Micrometer in side 25-50, 50-75, 75-150 mm with extension rod.
41.	Spanner, ring set of 12 metric sizes 6 to 32 mm.
42.	Spanner, adjustable 15 cm.
Sr. No.	Item/ Specification
43.	Spanner, adjustable 15 cm
44.	Spanners socket with speed handle, T-bar, ratchet and universal up to 32 mm
45.	Adjustable spanner (pipe wrench 350 mm)
46.	Oil can 0.5/ 0.25 liter capacity
47.	Cleaning Tray 45x30 cm
48.	Piston ring expander
49.	Piston ring compressor
50.	Piston Ring Groove cleaner
51.	Cylinder ridge remover/ cutter
52.	Feeler gauge piston (metric)
53.	Valve spring Lifter
54.	Valve grinding tool-suction type
55.	Valve key inserter
56.	Cylinder bore gauge capacity 20 to 160 mm
57.	Portable electric drill 6mm
58.	Injector cleaning Kit

59.	Injector dismantling and assembling jig and fixture
60.	Injector dismantling tool kit
61.	Fuel injection pump dismantling tool kit
62.	Torque wrench 12-68 Nm.
63.	Work bench 250x120x60 cm with 2 vices 12cm Jaw
64.	Pullers screw powered 2 mm gap with bearing puller attachment
Sr. No.	Item/ Specification
65.	Vice grip pliers
66.	Circlip pliers Expanding and contracting type 15 cm & 20 cm
67.	Inspection lamp with guard and wandering lead of 50 ft. length
68.	Crow bar
69.	Cleaning tray - Aluminum 45x30 cm with 6 small compartments
70.	Portable electric drill 6 mm
71.	Circlip plies 15 cm. Expanding type
72.	Circlip pliers 15 cm. Contracting type
73.	c. General Installation/ machineries
74.	Drilling machine bench to drill up to 12mm die
75.	Chain and pulley block 3000 kg. Capacity electric type
76.	Horses and wheel choke
77.	Bearing puller screw powered/ hydraulic powered with attachments Max spread 80, 200 and 300 mm
78.	Hydraulic jack with trolley capacity 3 Ton
79.	Screw jack one tone, capacity double lift
80.	Fuel feed pump (plunger type)
81.	Injectors
82.	Surface plate 60x60 cm
83.	'V' block 75x38 mm pair with clamps
84.	Electric pedestal grinder with two 18cm. Wheel
85.	Wheel alignment gauge
86.	Camber angle gauge

Sr. No.	Item/ Specification
87.	Fuel injection pump one with pneumatic governor, one with R.Q.V. governor and one with R.S.V. governor, VE pump/ DPC pumps
88.	Disk brake with caliper assembly
89.	Injector testing set (hand operated)
90.	Triple leg grip puller with bearings attachment screw/ hydraulic powered max. spread 80, 160, 250, 450 mm
91.	Fuel injector cleaning kit (in a wooden box complete)
92.	Engines 4 cylinder petrol MPFI and four cylinder diesel engine other than procured under module 01 and 02
93.	Toe-in, toe-out gauge
94.	Injector dismantling jig with mounting bench
95.	Speed counter - pointed type to read up to 5000 RPM
96.	Special tools for overhauling of inline and distributor type pumps with jigs
97.	Fuel injection pump test bench with accessories.
