FURTHER DETAILS REGARDING MAIN TOPICS OF PROGRAMME NO. 8/2013 (AUGUST) – ITEM No. 19

MECHANIC

KERALA AGRO MACHINERY CORPORATION LTD

CATEGORY NO. 287/2012

S Y L L A B U S

PART-I

MOTOR MECHANIC / TRACTOR MECHANIC / MECHANIC / AGRICULTURAL MACHINERY

1.	Shock Absorbers :-	Function, Types, Hydraulic Shock Absorbers
2	Steering Geometry:-	Checking and adjusting wheel alignment, camber angle, caster angle, kingpin inclination, toe-in, toe-out.
3.	Brake System:-	Function, Types of Brake, Power Brake, Hydraulic Brake, Air Brake
4.	Clutch:-	Function, Types of Clutch, Cone Clutch, Hydraulic Operated Clutch, Multi Plate Clutch.
5.	Fluid Fly Wheel:-	Introduction. Main parts of fluid fly wheel, Torque convertor.
6.	Gear Box:-	Resistance on Moving Vehicle, Gear Ratio, Mechanic Advantage using gear, Types of Gears.
7.	Engine:-	Spark Ignition Engine, 4Stroke and 2Stroke Engine
8.		Compression Ignition Engine, 4Stroke and 2Stroke Engine
9.		Vankel Engine and Turbine
10.	Engine Components:-	Piston, Rings, Crank Shaft, Fly wheel, Bearing, Valve, Timing Gears.
11.	Cooling System:-	Necessity of Cooling System, Air cooling, Water cooling
12.	Lubricating System:	Necessity of Lubricating System, Forced Lubricating System, Oil Pump, Oil Cooler, Oils, Oil relief Valve, Oil Pressure Gauge

13. Fuel Supply System: Gravity Feed System, Force Feed System, Carburettor, Fuel Injection Pump, Injector, Governor (Speed), Feed Pump,

PART-II

FITTER

(1) Marking and Measuring Tools :-

Surface Plate – Scriber – Caliper – Trammel – Punches – Surface Gauge – V block – protractor – combination set (including safety rules).

(2) Hand Tools:-

Hammer – Vices – Screwdrivers – spanners – pliers – socket spanners

(3) Measuring Tools :-

Measurement – System of Units – STEEL RULE – Trisquare – Micrometer – Vernier caliper – Dial caliper – Vernier Bevel protractor – (internal, external, depth, thread and various types of measurements)

(4) Gauges :-

LIMIT gauges and Fixed gauges – Plug gauges – Ring gauges – snap gauges – Telescopic gauges – Ample gauges – Radius gauges – Screw pitch gauges – Bevel gauges – Bore gauges – Drill gauges – Vernier tooth gauge – Slip gauges – sine bar

(5) Cutting Tools and Operations :-

FILE – parts – cut – grade – type – specification – filing techniques – convexity of file – HACKSAW – CHISELS – SCRAPER – DRILLING & DRILLS – Type of Drilling Machines – RPM – CUTTING SPEED – DRILLING TIME – Safety – REAMING – BORING – TAPING – THREAD CUTTING – DIES – GRINDING – Speed of Grinding Wheels

(6) Screw thread and Fasteners:-

Screw Thread – Element of Thread – Types – Single start – Multi start – right hand – left hand – Foundation Bolts – Type of Bolts – NUTS – STUDS – KEYS - PINS – SPLINES – FLANGES – COUPLINGS – CIRCLIPS – SOLDERING – BRAZING – TINNING – REVETING – SPRINGS – TAPER – Types of Taper.

(7) LIMITS AND FITS – SURFACE FINISH – GEOMETRICAL TOLERANCE –SURFACE FINISHING OPERATIONS

(8) POWER TRANSMISSION – BELT – GEAR – CLUTCHES – BEARINGS – CAM

(9) LUBRICATION – COOLANTS – GENERAL MAINTENANCE

(**10) JIG AND FIXTURES** – FERROUS AND NON FERROUS METALS – CAST IRON – WROUGHT IRON – STEEL – ALLOYS – NON METALS – Heat Treatment – Forging – Sheet Metal Work – Welding – Pipe and pipe fitting

(11) HYDRAULICS :-

Types of Valves – Symbols – Hydraulic Fluids – Hydraulic Pumps – Pascal's Law – Hydraulic Actuators – Hydraulic Circuits.

PART-III

WORKSHOP CALCULATION AND SCIENCE

1. ***Simple Fraction*** :- Addition, Subtraction, Multiplication & Division

2. ***Ratio and Proportion***

3. ***Percentage***

4. ***Algebra*** :- Algebraic equations, Quadratic equations

5.***Trigonometry*** :- Trigonometric ratios, Trigonometric identities, Height and Distance Trigonometric values of certain angles

6.***Mensuration***:- Area of Plane figures (Triangle, Square, Rectangles, Polygons) Volume of Solids (Pyramids and Prisms) , Lengths of Belts

7.***Heat and Temperature***:- Definition, Unit, Scales, Co-efficient of Linear Expansion, Latent heat of fusion, Latent heat of vaporization, Thermal Capacity, Interchange of heat, Tansmission of heat, Temperature measuring instrument.

8.***Friction***:- Definition, Advantages and Disadvantages of Friction, Normal Reaction, Limiting Friction, Law of Limiting Friction, Co-efficient of Friction, Angle of Friction, Inclined Plane.

9.***Work, Power, Energy***:- Definition, Units, Types of Energy, Kinetic Energy, Potential Energy, Horse Power of Engine, 1 H.P., B.H.P, F.H.P., Mechanical Efficiency, Transmission of Power by a Belt Pully Drive, I H.P. of Steam and Petrol Engines.

10. ***Moment and Lever***:- Definition, Types of Lever, Application of Lever

11. ***Simple Machines***:- Effort, Load, Mechanical Advantage, Velocity Ratio, Efficiency of Machine Screw Jack

12. ***Forces***:- Newton's Law of Forces, Parallelogram Law, Triangle Law, Conditions of Equilibrium, Kinds of Equilibrium, Moment of Inertia.

13. ***Mass, Weight, Density and Relative Density.***

PART- IV

FACTS ABOUT INDIA & KERALA