

MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI - 51

1	Name of Course	C.C.in Repair & Maintenance of Wheel, Retrading of Tyres & Wheel Balancing (306115)																																								
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	Laboratory = 1000 Sq feet Class Room = 200 Sq feet TOTAL = 1200 Sq feet																																								
8	Entry Qualification	S.S.C.																																								
9	Objective Of Syllabus/ introduction	Awareness of Safety precautions. Awareness of Various Types of Repair & Maintenance of wheel in Automobiles. Awareness of various types Re-Trading of Tyres in Automobiles. Awareness of Types of Wheel Balancing process in Automobile. Awareness of Repair & Maintenance of Wheel; Re-trading of Tyres & Wheel Balancing in Automobiles.																																								
10	Employment Opportunity	The trainee will either to be able to take up jobs with agencies which Develop, maintain and repair such Denting/ Painting & Welding of Automobiles or with working experience will be in a position to start his own independent Business.																																								
11	Teacher’s Qualification	Diploma in Mechanical/Automobile Engineering.																																								
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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13	Exam. System	<table><tr><td>Sr. No.</td><td>Paper Code</td><td>Name of Subject</td><td>TH/PR</td><td>Hours</td><td>Max. Marks</td><td>Min. Marks</td></tr><tr><td>1</td><td>30611511</td><td>Repair & Maintenance of Wheel; Re-trading of Tyres & Wheel Balancing.</td><td>TH-I</td><td>3 hrs</td><td>100</td><td>35</td></tr><tr><td>2</td><td>30611521</td><td>Basic of Transmission, Suspension, Steering System & Breaks</td><td>PR-I</td><td>3 hrs</td><td>100</td><td>50</td></tr><tr><td>3</td><td>30611522</td><td>Repair & Maintenance of Wheel; Re-trading of Tyres & Wheel Balancing.</td><td>PR-II</td><td>6 hrs</td><td>200</td><td>100</td></tr><tr><td></td><td></td><td>Total</td><td></td><td></td><td>400</td><td>185</td></tr></table>						Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	30611511	Repair & Maintenance of Wheel; Re-trading of Tyres & Wheel Balancing.	TH-I	3 hrs	100	35	2	30611521	Basic of Transmission, Suspension, Steering System & Breaks	PR-I	3 hrs	100	50	3	30611522	Repair & Maintenance of Wheel; Re-trading of Tyres & Wheel Balancing.	PR-II	6 hrs	200	100			Total			400	185
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SYLLABUS

Repair & Maintenance of Wheel, Retrading of Tyres & Wheel Balancing

Practical - II	Theory - I
<ul style="list-style-type: none"> > Removal & re-fitting of wheel from the vehicle > Check tyre & tube for puncture & inflate it to correct pressure > Removal & re-fitting of tyre from rim 	<ul style="list-style-type: none"> Types of wheels, its construction and parts. Purpose & desirable properties of tyre Types of tyres & tubes (solid & pneumatic tyre - Cross ply & Radial ply) Safety precautions during dismantling & assembling tyre & rim
<ul style="list-style-type: none"> > Removal & re-fitting of split rim from tyre > Vulcanizing of tubes > Repair tubeless tyre puncture. > Measurement of tread wear 	<ul style="list-style-type: none"> Components of tyre & their functions Manufacturing process of tyres Designation of tyres Vulcanizing process
<ul style="list-style-type: none"> > Tyre inspection > Wheel alignment & balancing > Causes of tyre wear 	<ul style="list-style-type: none"> Reasons for defects of tyre Maintenance of tyre & tubes Importance of tyre inflation Tread patterns & their applications Inspection procedure Procedure for tyre rotation of different vehicles (front wheel drive, rear wheel drive & all wheel drive vehicles) Procedure & Types of balancing and importance of dynamic balance
<ul style="list-style-type: none"> > Re-tread different types of tyres & Tread Pattern 	<ul style="list-style-type: none"> Purpose & function of steering geometry and their effect on tyre wear Equipments used for retreading & the knowledge of material sourcing Different Types of tyres Re -treading Material used in re-treading & re - treading procedures General operation & maintenance of machines and equipments used for retreading
<ul style="list-style-type: none"> > Check & adjust steering geometry > Check & grease center pin (pivot pin) 	<ul style="list-style-type: none"> Advantages and disadvantages of re - trading Description of different types of steering geometry
<ul style="list-style-type: none"> > Check & adjust free play of steering system > Wheel balancing with electronic balancer > Trouble shooting of wheels 	<ul style="list-style-type: none"> Wheel alignment & balancing procedures Wheel balancing procedure with electronic balancer Trouble shooting of procedure wheels

Basic of Transmission, Suspension, Steering System & Brakes

Practical - I
Safety precautions in handling asbestos. Dismantling a clutch assembly from the engine, clean and inspect parts for wear and damage. Changing pressure plate and flywheel. Testing the of clutch springs for uniform tension, assembling of pressure plate and spring, adjusting the fingers and aligning clutch with flywheel.
Cleaning, assembling gearshift mechanism, changing oil in the gearbox. Studying different types of oil seals and bearings used in the gearboxes.
Studying the gear ratios in the gearbox. Removing, cleaning and refitting 'U' joints, propeller shaft drive. Dismantling of an old final rear axle assembly, clean and inspect parts, cut packing and gaskets. Remove crown wheel, pinion and bearings, clean parts. Check tooth contact in the crown and pinion and adjust backlash. Assemble rear axle assembly and study its functioning.
Removing and refitting a leaf spring as an assembly in a vehicle, changing rubber bushes of shock absorbers and independent front suspension. Lubrication of suspension units.
Removing and refitting steering boxes from vehicle, checking and topping up oil in steering box. Checking and adjusting steering wheel play and backlash.
Checking and correcting the steering geometry with instruments.
Identification of Pneumatic valves, Components, parts of Air compressor and to draw the symbols. Construction of circuits using single acting cylinder, Double acting cylinder and direction control valve. Construction of circuits for pneumatic power press, pneumatic hammer using double acting cylinder, directional control valve and flow control valve.
Dismantling and assembling of 4 / 3 way directional control valve Dismantling and assembling of flow control valve Dismantling and assembling of Single acting, Double acting and double acting double rod cylinders Dismantling and Assembling of Pressure Control valve Tracing and drawing the hydraulic circuits for the following machines Hydraulic Power hack saw machine
Checking and adjusting hand brakes and pedal play in foot brakes. Dismantling wheel brake assembly– removing old lining and fitting new lining on the brake shoe.
Removing & cleaning of brake drums. Fittings new cups and brake hose pipes – re-assembling. Adjusting all four wheel brakes and testing for brake concern.

List of tools, machinery & equipments etc.

Sl No	Item	Qty.
a) Trainee's Toolkit		
01	Steel rule 15 cm. English and metric	10 Nos.
02	Screw driver 20cm.X 9mm. Blade	10 Nos.
03	Screw driver 30 cm. X 9 mm. Blade	10 Nos.
04	Spanner D.E. set of 12 pieces (6mm to 32mm)	10 Nos.
05	Pliers combination 20 cm.	10 Nos.
06	Pliers side cutting 15 cm	10 Nos.
07	Plier round nose 15 cm	10 Nos.
08	Plier flat nose 15 cm	10 Nos.
09	Hand file 20 cm. Second cut flat	10 Nos.
10	Hand file 20 cm. Second cut half-round	10 Nos.
11	Hand file 20 cm. smooth triangular	10 Nos.
12	Hand file 30 cm. bastard	10 Nos.
13	Hand file 30 cm. round bastard	10 Nos.
14	Centre punch 10 cm.	10 Nos.
15	Chisel cold flat 20 mm.	10 Nos.
16	Feeler gauge 20 blades (metric)	10 Nos.
17	Steel tools box with lock and key (folding type) size 400X200X150mm	10 Nos.
b) Shop Outfits & Measuring Instruments		
18	Hollow punch set of seven pieces 6mm to 15mm	1 Set.
19	Drift punch copper 15 cm	2 Nos.
20	Oil can 0.5/0.25 liter cap.	2 No.
21	Cleaning Tray 45x30 cm.	4 Nos.

Sl No	Item	Qty
22	Hand reamers adjustable 10.5 to 11.25 mm, 11.25 to 12.75 mm, 12.75 to 14.25 mm and 14.25 to 15.75 mm	2 Sets
23	Prick punch 15 cm.	2 Nos.
24	Chisels cross cut 200 mm X 6mm	2 Nos.
25	Allen Key set of 12 pieces (2mm to 14mm)	04Sets
26	Philips Screw Driver Typeset of 5 pieces (100 to 300 mm)	04Sets
27	Engineer's square 15 cm. Blade	2 Nos.
28	Dividers spring 15 cm.	2 Nos.
29	Ball peen Hammer 0.5kg.	16 Nos.
30	Scriber with scribing black universal	4 No.
31	Marking out table 90X60X90 cm.	1 Nos.
32	Hacksaw frame adjustable	4 No.
33	Mechanic stethoscope	1 Nos.
34	Hand vice 37 mm	2 Nos.
35	Drill Twist (assorted)	10 Nos
36	Taps and Dies complete sets (5 types)	1 set
37	Micrometer out side 0-25 mm, 25-50 mm	1 each
38	Mallets wooden/plastic.	2 Nos.
39	Micrometer in side 25-50, 50-75, 75-150 mm with extension rod.	1 each
40	Micrometer out side 50 mm to 75mm and 75 mm to 100 mm.	1 each
41	Spanner, ring set of 12 metric sizes 6 to 32 mm.	2 Nos.
42	Spanner, adjustable 15cm.	1 No.
43	Torque wrench 5-35 Nm, 12-68 Nm & 50-225 Nm	1 each
44	Work bench 250 x 120 x 60 cm with 2 vices 12cm Jaw	2 Nos.