### MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

(Autonomous)

(ISO/IEC - 27001 - 2005 Certified)

### WINTER- 17 EXAMINATION

**Subject Vehicle Maintenance & Garage Practice** 

**Model Answer** 

Subject Code: 17618

### Important Instructions to examiners:

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills.
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q. No.	Sub Q.	Answer	Marking Scheme
Q1	N	Attempt any THREE of the following	12
<u> </u>	i	Enlist any two functions of each following  1) Torque wrench 2) FIP calibration machine 3) Wheel aligner 4) Arbor press	04
	Ans.	Functions (Any two points - 1 mark each)  1) Torque Wrench  i) It allows tightening the nut on a bolt to required extent so that assembly functions properly.  ii) The dial on torque wrench allows setting the torque to which technicians want to tighten a nut.  2) FIP Calibration Machine  i) It is for adjusting the fuel oil deliveries of the pumping element so that each will deliver the same quantity.  ii) It is used to produce clear exhaust with no unburnt fuel present and economic consideration as well.  3) Wheel Aligner  i) It is used to restore the vehicle suspension to the original or manufacturers specifications.  ii) It is basically a proper adjustment of all the interrelated suspension angles affecting the steering and running of the vehicle.  4) Arbor Press  i) It is to perform smaller jobs, such as staking, riveting, installing and removing bearings and other press fit work.  ii) It is used for freezing followed by tapping into place with rubber hammer.	04



Ans.  (Any four points - 1 mark each)  (Nork quietly and give full attention to the job in hand.  (Neep tools and equipments in use under control.  (Neep tools and equipments in use under control.  (Neer piack handles out of the way. Stand the creeper against the wall when not in use.  (Never indulge in horseplay or other foolish action. It may cause to someone to seriously hurt.  (Never put screwdrivers or other sharp objects in pocket.  (Make use of proper clothing for job under action. Dangling sleeves or ties can be caught by the machine and cause injury.  (No not wear any rings, bracelets, watches when working around moving machineries or electrical equipments. Jewelry can catch in moving machinery with very serious results. Also, a ring or bracelet can accidently create a short circuit of the battery. Then the metal of the ring or bracelet can become white hot in an instance. This can severely burn the technician.  (New points of the battery. Then the metal of the ring or bracelet can become white hot in an instance. This can severely burn the technician.  (New pix grease and oil from hands and tools to get a good grip on tools and parts.  (Necessity of maintenance (Any four points - I mark each):  In order to ensure satisfactory operation of motor vehicle and freedom from troubles, it is necessary to provide maintenance.  Ans.  Necessity of maintenance (Any four points - I mark each):  In order to ensure satisfactory operation of motor vehicle and freedom from troubles, it is necessary to provide maintenance attention towards certain specified items of the motor vehicle at regular intervals  Nany possible troubles can be prevented from happening by taking proper care and maintenance of motor vehicle  Regular maintenance also improves the performance of vehicle, availability or maximum utilization of vehicle and improves economically operation.  Ans.  To reduce repair cost  Write the procedure of checking oil level and its condition.  Ans.  In Park the vehicle on a flat even surface to get an accurate rea	ii	State four general safety precautions and procedures to be taken while using tools and equipment's.	04
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		<b>To check engine oil condition:</b> Examine the colour and quality of the oil.	



		1. The colour and the consistency of engine oil are indicative of its age, and	
		possibly of other engine efficiency issues.	
		2. Wipe the oil off the end of the dipstick and examine it on the rag. Engine oil	
		that's in good condition should look slightly yellow-greenish on the rag, and	02
		shouldn't be super-dark.	02
		3. If colour of oil is milky appearance, this could mean coolant is leaking into the	
		engine.	
		4. Oil will change in colour from golden or amber colored to brown and black as	
		more and more particulate gets in the oil from the engine.	
		5. Look closely for any metal particles, too, as this could mean there is internal	
		engine damage.	
		6. If colour of oil is too black, then there is need of oil change.	
Q1	b	Attempt any ONE of the following	06
Ų1	i	Draw a layout for "Dent and paint shop" and list tools and equipment	06
	1	required.	VV
	Ans.	requireu.	
	Alls.	Denting Tools:	
			02
		(1) Hammer (2) Dolly blocks (3) Spoons (4) Files (5) Pick Tools	<b>~</b>
		Denting equipments:	
		1. Soldering equipment (blow lamp, Acetylene torch, and Brazing torch etc)	
		2. Electric and gas welding equipment:	
		3. Buffing and polishing machines	02
		4. Drilling Machine	02
		5. Hydraulic press	
		Painting Tools and Equipments:	
		(1) Brushes. (2) Roller Covers (3) Air compressor. (4) Spray Gun. (5) Dual-	
		Action Sander. (6) Masking tape and paper.	
		LAY OUT:	
		Body-in-white Washer Pretreatment CED Baking oven	
		Wastlet Pretteathlett CED Baking Over	
		Drying Sound dampers Sealing Sanding	
		Cleaning Primer surfacer application Baking oven	
		Reking even Clear cost Floring Proceed Clearing	02
		Baking oven Clear coat Flash off Basecoat Cleaning	02
		Inspection Repair Waxing	
		To Assembly line	
		Back to "Cleaning" before primer surfacer application	
		OR	
L	<u> </u>		



		Final Underbody Engine Repairs Paint Booth Car washing & cleaning			
		Spare Oil Wheel Repairs Store Replacement Alignment Repairs Repairs Door Repairs, etc.			
		(Credit should be given any equivalent figure)			
	ii	Describe general servicing procedure for major assemblies in an automobile.	06		
	Ans.	General Servicing Procedure for Vehicle:	<b>30</b>		
	7 1115.	[1] Park the vehicle on the servicing ramp.			
		[2] Place the stopper at the front and rear of the wheel.			
		[3] Drain the Engine oil from engine oil sump and fill up new recommended oil.			
		[4] Check oil level in gear box and differential. If level found less top up to			
		correct level by	06		
		Specified oil.			
		[5] Clean air filter by blow of compressed air. If clogged replace with new one.			
		[6] Check the water level, coolant level and Belt tension of the alternator.			
		[7] Check battery electrolyte level. If necessary top up to correct level.			
		[8] Perform engine tune up, if required.			
		[9] Do the brake and clutch adjustments as required.			
		[10] Check tyre condition and do tyre rotation if required			
		[11] Perform Wheel alignment and wheel balancing if necessary.			
		[12] Wash the vehicle thoroughly and by using grease gun lubricate the points where grease lubricant required.			
Q2		Attempt any FOUR of the following	16		
Q <sup>2</sup>	0	Describe breakdown maintenance for a motor vehicle.	04		
	Ans.	Breakdown maintenance for a motor vehicle-	U4		
	Alls.	i)Starter does not operate			
		a) Try turning the ignition switch to the "START" position with the headlights			
		turned ON to determine the battery condition. If the headlights go dim excessively			
		or go off, it usually means that either the battery has run down or battery terminal			
		contact when the cause is determined.			
		b) If the headlights remain bright, check the fuses. If the trouble persists, take the			
		vehicle to authorized service station as there may be a major electrical problem.			
		ii)Jump starting			
		a) If the engine does not start due to discharged battery, a well charged separate	04		
		battery or one in another vehicle may be connected to the system to help supply			
		enough electrical energy.			
		iii) Flooded engine			
		a) If the engine is flooded with the gasoline, the engine may be hard to start. In			
		that case, press the accelerator pedal all the way down and hold, nut do not pump.			
		b) Turn the engine until it fires, clears the excess gasoline and runs smoothly (but			
		do not operate the starter motor for more than 10 seconds).			
		iv)Engine overheats			



1		
	a) The engine could overheat temporarily during severe driving conditions. If the	
	engine coolant temperature gauge indicates overheating during driving Turn OFF air conditioner, if equipped.	
	- Take the vehicle to a safe place and park.	
	- Let the engine run at normal idle speed for a few minutes until the gauge	
	temperature goes down to the safe zone.	
b	Draw a format of work order and state its importance.	04
Ans.	Importance of Work order:	
	It contains details of vehicle owner as well as vehicle, job to be done on vehicle, list of spare parts and cost, and labor cost incurred.	
	Work orders to track inventory. While work orders are typically associated with people and the time they spend, a good work order system also helps you track inventory  A format of work order	02
	XYZ Automobiles	
	Work Order	
	Work Order No Date	
	Name of Customer	
	Address	02
	Vehicle Reg. No.	
	Engine No Chassis No	
	Description of Repair	
	Signature of Signature of	
	Service Engineer Customer	
		0.4
c	Explain meaning of "Workshop layout". Write facilities and major equipment's	04
	Teallirea for aggier of commercial vanicies	
Δne	required for dealer of commercial vehicles.  Workshop Layout:	
Ans.	Workshop Layout:	
Ans.		
Ans.	Workshop Layout: Layout of a garage or service station plays important role in efficient working of	02
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	Required Tools and equipments: (Any four)	
	a) Screw driver: standard, flat, insulated standard, offset, ratchet, and Phillips	
	screw driver.	
	b) Pliers: combination, long nose, round nose, side cutting, adjustable, slip joint	01
	pliers.	<b>71</b>
	c) Wrenches: open end, box end, ring, tubular, socket wrench.	
	d) Files: General purpose e) Hacksaw f) Chisel g) Hammer h) Ridge reamer. i)	
	Torque wrench. j) Hydraulic Jack. k) Electric soldering gun. l) Portable electric	
	drill. m) Air compressors. n) Bench Vice o) Battery Charger p) Piston ring	
	compressor q) Piston ring expander r) Valve spring compressor s) Bearing Puller	
d	Describe the procedure of measurement of cylinder bore wear.	04
Ans.	Procedure of measurement of cylinder bore wear	
	1. Select a cylinder to be bored and the pistons will have to be replaced with the	
	correct oversize.	
	2. Use the inspection notes to determine the oversize of the bores required to clean	
	up the Worst cylinder.	
	3. The cylinders should be bored to the smallest oversize piston that will, clean the	
	worst cylinder bore.	
	4. Center the cutting bit using the bottom of the cylinder where no wear has	
	occurred.	
	5. Once the boring bar is located at the centering location, turn the control knob to	
	expand the centering fingers. The bar may have three or four fingers The fingers	
	contact the indexing the engine block by inserting an anchor assembly through the	
	cylinder adjacent to the one being bored, next, raise the boring bar out of the	
	cylinder adjacent to the one being bored, next, raise the boring bar out of the cylinder.	
		02
	6. Install the cutting bit into the tool holder using a micrometer that has been set to	
	the desired dimension of the cylinder.  7. Fit the tool holder into the horing her head and adjust it to the required setting.	
	7. Fit the tool holder into the boring bar head and adjust it to the required setting	
	using a special boring bar micrometer. The set screw locks the tool holder into the	
	head before cutting the bore, set the feed stop to prevent the boring bit from going	
	past the bottom of the cylinder.	
	8. Finally, set the spindle speed and feed rate. The settings used will depend upon	
	the type of machine used, the type of material the block is constructed of, and the	
	type of bit used.	
	9. Finally, turn on the motor and engage the feed lever. The cutting bit will work	
	its way down the cylinder as it cuts the bore. When the bore bar reaches the	
	bottom of its travel, turn off the motor.	
	10. Remove or relocate the cutting bit so the bore bar can be raised out of the	
	cylinder	
	11. Without damaging the new cylinder wall surface	
	12. If a chamfer was not already cut, do so now. Check the bottoms of the	
	cylinders for chamfer. Some chamfer should remain. A sharp edge at the bottom	
	of the cylinder can scrape oil off of the piston skirt.	

		Boring		
		Fig. An indexing plate is	Cylinder block used to center the bore bar.	02
		(Eauivalent Credit shall b	pe aiven for suitable sketch)	
	Proc	edure for inspection and measure		
		sually check the cylinder bore for ve	•	
		pect cylinder bore for cracks.		
		<u>-</u>	r bore gauge, measure the cylinder bore	04
		-	bore as well as in the thrust and axial	
		tions.		
		ke the measurement at A and B with	<u> </u>	
	5 The	e difference in the reading is ovality	7 =A-В	
			A	
		(		
			В	
e	T4 ia			
	ILIS	observed that engine is overheated	d, what will be probable causes?	04
		observed that engine is overheated gest suitable remedies.	d, what will be probable causes?	04
Ans.	Sugg		d, what will be probable causes?	04
	Sugg Engi	gest suitable remedies. ne is overheated(Any four)		04
	Sugg	gest suitable remedies.	d, what will be probable causes?  Remedies	
	Sugg Engin	gest suitable remedies. ne is overheated(Any four)		04
	Sugg Engin	gest suitable remedies. ne is overheated(Any four)  Causes	Remedies	
	Sugg Engi  S.  N.  1)	rest suitable remedies. ne is overheated(Any four)  Causes  Low coolant level	Remedies  Refill, check for leakage	
	Sugg Engi:  S. N.  1) 2) 3)	Causes  Low coolant level Loose belt Defective pressure cap	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure	
	Sugg Engir  S.  N.  1)  2)	causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold	
	Sugg Engi S. N. 1) 2) 3) 4)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris	
	Sugg Engi:  S. N.  1)  2)  3)  4)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris Test, replace if necessary	
	Sugg Engi  S. N. 1) 2) 3) 4) 5) 6)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan	
	Sugg Engi:  S. N.  1)  2)  3)  4)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris Test, replace if necessary	
	Sugg Engi  S. N. 1) 2) 3) 4) 5) 6) 7)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris Test, replace if necessary Replace fan Replace	
	Sugg Engi  S. N.  1)  2)  3)  4)  5)  6)  7)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch Faulty ignition	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan Replace Test retime if necessary	
	Sugg Engi  S. N. 1) 2) 3) 4) 5) 6) 7)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan Replace  Test retime if necessary Check water pump, hoses, radiator,	
	Sugg Engi  S. N.  1)  2)  3)  4)  5)  6)  7)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch Faulty ignition Obstructed coolant flow	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan Replace Test retime if necessary	
Ans.	Sugg Engi:  S. N.  1)  2)  3)  4)  5)  6)  7)  8)  9)	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch Faulty ignition	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan Replace  Test retime if necessary Check water pump, hoses, radiator, block	04
	Sugg Engi:  S. N.  1)  2)  3)  4)  5)  6)  7)  8)  9)  10  State	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch Faulty ignition Obstructed coolant flow  Exhaust system restricted  the procedure of vacuum test for	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan Replace  Test retime if necessary Check water pump, hoses, radiator, block Check for restrictions	
Ans.	Sugg Engi S. N. 1) 2) 3) 4) 5) 6) 7) 8) 9) 10  State Proc	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch Faulty ignition Obstructed coolant flow  Exhaust system restricted  the procedure of vacuum test for edure to be carried out the vacuu	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan Replace  Test retime if necessary Check water pump, hoses, radiator, block Check for restrictions  ran engine. m test of cylinder:	04
Ans.	Sugg   Engine	Causes  Low coolant level Loose belt Defective pressure cap  Radiator or air conditioner condenser obstructed Thermostat stuck closed Fan clutch Defective electric fan motor or switch Faulty ignition Obstructed coolant flow  Exhaust system restricted  the procedure of vacuum test for edure to be carried out the vacuusuring the amount of manifold vacuus	Remedies  Refill, check for leakage Adjust, replace if worn Test, replace if unable to hold pressure Remove bugs, leaves, debris  Test, replace if necessary Replace fan Replace  Test retime if necessary Check water pump, hoses, radiator, block Check for restrictions	04

	<ol> <li>Run the engine so that the water temperature is between 750C to 800C.</li> <li>Disable the ignition.</li> <li>Connect the vacuum gauge to a manifold vacuum source.</li> <li>Crank the engine while observing the vacuum gauge.</li> <li>Observe the gauge to note the reading. Reading should not be less than 40 cm of Hg. A low vacuum reading if recorded means that leaky cylinder head gasket.</li> </ol>	02
	(Credit should be given any equivalent figure)	
Q. 3	Attempt any Four of the Following: (4 x 4 = 16)	16
a	Describe procedure for checking and servicing of cylinder head.	04
Ans	Procedure for Checking Procedure, 2 Marks for Servicing Procedure) Procedure for Checking of Cylinder Head: [1] After the Cylinder head removal from cylinder block, first observe the nature of carbon deposits which would indicate that the cause of excessive oil consumption or overheating if present. [2] A careful examination of cylinder head would reveal the exact entry point for the oil. [3] Check the gasket surface of the head for nicks or rough spots. These can be removed with a fine cut mill file. [4] Clean head before checking for flatness. Rock the straight edge so one edge of it rests against the opposite side of the head. A round, straight bar is also available for checking straightness.  Procedure for Servicing of Cylinder Head: [1] First step is to clean the Cylinder head. Before proceeding to do this, cover all the water ports, etc. with a clean cloth. [2] Then remove the carbon from the combustion chamber, valve, seats, etc. with the help of scraper. [3] Stud holes & valve guides may be cleaned with a wire brush fitted in an electric drill. [4] Remove all the traces of carbon dust by blowing out with air under pressure.	02



		[6] Afte		er head with kerosene and let it dry. nead visually. Look out for warpage,	02		
			-	rped heads are resurfaced by smooth			
Q. 3	b	Identify		lowing fault: "If starter motor runs	04		
	Ans.	Probab start":	Probable Causes & Remedies for "If Starter motor runs but engine does not start":				
			y 4 appropriate causes with suitabl	e remedies, 1 Mark for each)			
		S. N.	Probable Causes	Remedies			
		1	Starter drive stuck or binding.	Clean starter shaft and/or repair as necessary.			
		2	Starter drives spring or bolts broken.	Replace starter spring or bolt, or replace drive.			
		3	Starter drive pinion or flywheel gears have several teeth missing.	Replace starter drive or flywheel gear as necessary.			
		4	Armature shaft broken.	Replace armature.	04		
		5	Bent armature shaft.	Replace armature.			
		6	Run down or Partially discharged or defective battery.	Charge or replace the battery.			
		7	Defective wiring or wiring capacity too low.	Locate and replace defective wiring.			
		8	Broken Bendix drive.	Remove starter motor and repair drive.			
Q.	c	Write t	he procedure for checking and sen	vicing of bent crankshaft.	04		
3		(2 Mar	ks for Checking Procedure, 2 Mark	cs for Servicing Procedure)			
		,	•	•			
	A		ure for Checking Bent Crankshaft	bected for alignment and for wear of			
	Ans.		and the crankpin.	beeted for anginnent and for wear of			
			-	nkshaft), the crankshaft is supported at	0.0		
				nent is checked by means of dial gauge	02		
			base is fixed at some suitable place.	over also be oversented on lothe contains			
				ay also be supported on lathe centers. re that the centers and the centre holes			
			not be defective, otherwise the readi				
		[3] Crankshaft should be supported on the front and rear main bearing journal in V blocks. Dial indicator mounted on plain base is used to check the amount of run out, at each main bearing journal. Crankshaft should be run within 0.003 inch.					
		Procedure for Servicing of Bent Crankshaft: [1] Any bend if exists, of this amount should be corrected by striking the shaft in a					
		press motion.  [2] Crankshaft is straightened by supporting the shaft on V blocks and applying pressure against high side of the shaft.  [3] If the crank shaft is out of line, a new or reground crank shaft should be used. A special lathe, crankshaft grinder, is required to grind the main bearing journals					
		-	nk pins on a crankshaft.				



Q. 3	d	Describe pressure testing in cooling system.	04
<u> </u>	Ans.	Procedure of Pressure Testing in Cooling System:	
		(4 Marks for appropriate Test Procedure mentioned as below.	
		Equivalent credit shall be considered to any suitable points other than below	
		mentioned procedure)	
		The detailed procedure for pressure testing in cooling system is mentioned as below;	
		[1] First, allow the engine to cool down completely.	
		[2] A cooling system pressure tester can be installed in place of the radiator cap.	
		[3] Use caution, and never remove the radiator cap from an engine that has been run even for a short time.	
		[4] After relieved any excess pressure, can fully remove the radiator cap.	
		[5] After installing the gauge, pressurize the cooling system by operating the plunger on the pump.	
		[6] Look around for leaks if the gauge shows any pressure loss.	
		[7] Common trouble spots include heads, hoses, water pump and rear heater core.	
		If you smell something sweet when you turn the heater fans on, it may be a	
		coolant leak at one of the heater cores, or simply the O-ring at the rear heater valve leaking.	
		[8] Because there is often more than one leak in the system, it is necessary to	
		continue pressure testing until the system holds pressure.	04
		[9] Start the engine cold with no pressure indicated on the gauge.	•
		[10] The pressure in the cooling system builds to approximately 7 lbs at normal	
		running temperatures looking around for leaks. But if the pressure builds quickly	
		to around 15 lbs the pressure is coming from one of the cylinders through the inner head gasket.	
		[11] This can also show up as a coolant pressure loss in the first test.	
		[12] In extreme cases the cylinder can fill with coolant, and will not turn over.	
		[13] This is known as hydraulic lock, and if you suspect this pull the spark plugs and tries to turn the engine again.	
		[14] Pulling the plugs from the engine allows water to escape from the spark plug holes.	
		If gauge stays consistent, then don't have a leak. If a vehicle that was having an	
		overheating problem then try running it with the pressure tester connected. This	
		would simulate a working cap. If vehicle does not overheat then pressure cap that	
		is causing the coolant to boil before it should because the system is not pressurized.	
<b>)</b> .	e	Describe cleaning & testing of mechanical fuel injector.	04
2. 3		Describe cleaning & using of mechanical fuel injector.	<b>7</b>
	Ans.	Cleaning & Testing of Mechanical Injector:	
		(2 Marks for Cleaning Procedure, 2 Marks for Testing Procedure.	
		Equivalent Credits shall be considered for appropriate points related to Testing	

### MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

(Autonomous) (ISO/IEC - 27001 - 2005 Certified)

Procedure. Figure is not essential)

### **Cleaning of Mechanical Fuel Injector:**

Specifically, the following things need to be observed and tested in cleaning of Mechanical Fuel Injector by Manually or using Special FIP Cleaning Kit:

- 02
- [1] **Leaking:** Fuel injectors have individual components pintles, balls and discs that must be properly sealed while under operating pressure to avoid leaking.
- [2] Fuel Volume: Injectors need to supply the right amount of fuel under operating pressure.
- [3] **Atomization:** Fuel needs to be under high pressure and atomized properly to provide optimal combustion.
- [4] **Distribution:** The spray pattern of the fuel mixture is extremely important to guarantee safe and efficient combustion.

### **Testing of Mechanical Fuel Injector:**

Testing of fuel injector is carried out as follows.

- [1] Mount the Fuel injector in its test rig, to be tested to injector pipe of tester as shown in fig. and connect the oil supply.
- [2] Work the hand pump. Note the opening pressure of spray on gauge provided. If the pressure is less, it is increased by loosening the check nut and tightening the adjusting screw.
- [3] If it is more than the specified, the adjusting screw is loosened.
- [4] After adjusting pressure, lock the lock nut and replace the cap.
- [5] In some make of nozzles shims are added or removed instead of adjusting screw.
- [6] Under no circumstances should hands be placed under the injector spray. The high velocity oil jet can penetrate the skin and cause blood poisoning.
- [7] With the injector priming valve open, operate the hand pump to prime the injector. Once the fuel flows from the priming valve it can be closed.
- [8] Then connect a low pressure air supply to the other connection. Leave the air on for a short period of time and test for internal or external leakage.

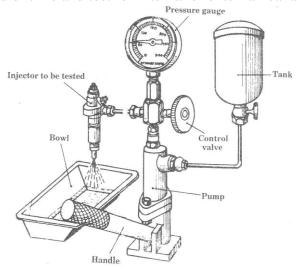


Figure: Mechanical Fuel Injector Test Rig

02



Q. 4	a	Attempt any Three of the Following: $(3 \times 4 = 12)$	12
	i	Describe the procedure of diagnosing External oil leakage in lubrication system.	04
	Ans.	Procedure of Diagnosing external oil leakage in lubrication system:	
		(4 Marks for appropriate diagnosing procedure. Equivalent Credits shall be considered for appropriate diagnosing points related to external oil leakage other than mentioned below.)	
		If the operator must add oil frequently to the engine, this is a symptom of high oil consumption or External Oil Leakage. External oil leakage out of the engine or internal leakage of oil into the combustion chambers causes high oil consumption. External oil leakage detected as darkened oil wet areas on or around the engine. In this condition, oil may also be found in small puddles under the vehicle. Leaking gaskets or seals are usually the source of external engine oil leakage.	
		When diagnosing the troubles related with high oil consumption or external oil leakage in lubrication system, make a visual inspection of the engine for obvious problems. Check for oil leakage, disconnected sending unit wire, low oil level, damaged oil pan, or other troubles that relate to the symptoms.  [1] Oil leaks can be located by placing a clean piece of cardboard on the ground under the engine. This will give you a rough idea where on the engine you need to look to find the leak. If there is an excess amount of oil found on the engine, an engine cleaner can be used to remove the oil which will help in locating the leak.  [2] The general rule is to always repair the highest oil leak first because you may have multiple leaks. Oil running down from the top of an engine can mask a leak from a lower component.  [3] Re-tightening oil pans, valve covers, intake manifolds or other items that have gasket seals usually does not stop oil leaks.  [4] Many times oil leaks are caused by over tightening engine components with gaskets.	04
		[5] Leaking gaskets in most cases will need to be replaced.	
	ii	Describe how phasing of FIP is done?	04
	Ans.	(4 Marks for appropriate stepwise procedure of Phasing of FIP)  The camshaft of the pump rotates at half the speed of the crankshaft. Therefore, the supply of oil from each plunger should be at 900 differences for a four cylinder engine. This means that the timing of fuel delivery and cut off between one cylinder and the other should be 900. The adjustment of fuel pumps at correct timing intervals is known as the as the 'phasing of the pump'. The procedure of FIP Phasing is as below;  [1] Pump element No. 1 is first kept at its TDS.  [2] The setting of the other pump elements is then checked.  [3] The gap between the lower end of the plunger and the top of the tappet roller should be 0.5 mm.	
		[4] If the position of the plunger can be raised or lowered in the barrel by means of an adjusting screw. [5] After this gap is made uniform for every plunger, element the phasing should be started	04

		[6] The point of port closer in each element should be correctly noted.	
		[7] This is done by gradually lifting the plunger from its bottom position.	
		[8] For this the valve and valve spring are removed from the pump element.	
		[9] As the plunger goes up gradually, the oil coming out of this valve keeps	
		reducing.	
		[10] When the plunger is just closing the two ports, the oil supply from the valve	
		passage stops.	
		[11] This is found out by the attaching a swan neck pipe for the closure point of	
		cut off to the pump barrel.	
		[12] When the plunger moves up there is a supply of the fuel through this neck.	
		When the plunger closes the ports, the supply of the fuel from the swan neck pipe	
		stops.	
		[13] Thus, the exact position of the timing of closure of the two ports can be found	
		out. All other elements can be tested in a similar way. The difference one element	
		and the other should be 900. The phasing of the diesel pump can now be easily	
		done.	
	iii	Describe checking and adjusting of fan belt tension.	04
			V4
	Ans.	(2 Marks for Checking, 2 Marks for Adjusting of Fan Belt Tension)	
		Checking the Cooling Fan Belt Tension:	
		1. Note the line the belt makes.	
		2. Push the belt inwards with your finger.	
		3. It should only deflect 1/2" to 3/4" (9 - 10mm).	
		, , , ,	02
		Adjusting the Cooling Fan Belt Tension:	-
		1. Remove the pulley nut.	
		2. Observe that there are some notches in the front half of the pulley.	
		3. Take screwdriver and stick that in one of the notches so it can hold the pulley	
		stationary while using wrench to loosen the pulley bolt.	
		4. By removal of bolt, see a metal bell-looking thing, and under that are some	
		shims.	02
		5. Remove the rear pulley half.	02
		6. Then add or subtract shims as required to bring your belt tension into	
		specification.	
	iv	Describe checking and servicing of pressure plate surface and thickness.	04
Q. 4	IV	Describe checking and servicing of pressure place surface and unckness.	V4
-	Ana	Charling & Convising of Duaggung Dlate Courfe as & Thickness	
	Ans.	Checking & Servicing of Pressure Plate Surface & Thickness:	
		(4 Marks for appropriate checking & Servicing procedure. Equivalent Credits	
		shall be considered for related suitable points other than mentioned below.)	
		The pressure plate assembly is connected with the flywheel and holds the clutch	
		plate with the flywheel due to its pressure. It consists of pressure disc, springs,	
		operating fingers or release levers and pressure plate cover held with bolts. The	
		coil springs are held between the cover and the plate. The fingers act as levers and	
		pressed down, results in lifting off pressure plate against the spring force and	
		pressure is released.	
		[1] Check up pressure plate friction surface for flatness. <i>If any defect found in the</i>	04
		above checking, the pressure plate should be grind.	
		[2] While grinding the pressure plate surface, one care should be taken to remove	
i		the material that it should not be more than recommended value, otherwise replace	

			`	*		
		the p	ressure plate.			
		[3] C	Check the pressure plate facing for the	ne neat damage. Surface should not be		
		glazed. Surface should not be scored or crack.  [4] Check the plates periodically for warpage. This warping is caused by heat put				
				warping with a straightedge and feeler		
			e. Maximum allowable warpage is .00			
				minimum thickness of .525". Floaters		
			Id never be resurfaced.	imminum thekness of .323 . Houters		
				n reinstalling the plates. After installing		
			_	they contact the thrust buttons on one		
		_		•		
				the thrust buttons and the plates. This		
0.4	<b>a</b> >		e minimum clearance for proper clutch		0.6	
Q.4	(b)		mpt any One of the following: (1 x 6		06	
	i		e causes and remedies for the follow	ring:	06	
	Ans.		auge indicates High oil pressure.		03	
		(List	any 6 probable causes & remedies, 1/2	2 Marks for each)		
		S.	Possible Causes	Remedies		
		N.				
		1	High Idling Pressure at the time of	Maintain the engine condition.		
			starting.			
		2	Defective in relief valve	Remove the valve, clean it and		
				replace it if required.		
		3	A Clogged or dirty oil filter.	Remove oil filter, clean it or replace		
			,	it if the valve is damaged.		
		4	The oil used may be of too high	Drained out it and the oil with		
			viscosity.	correct viscosity filled in.		
		5	Defective oil sending unit	The unit should be checked for		
		<u> </u>		possible faults regularly.		
		6	The oil lines, galleries may be	Clean it.		
		7	clogged.  The relief valve in the oil pump	Inspect & Repair.		
		$\parallel \parallel \parallel$	may be stuck in the closed	півресі & Керап.		
			position.			
		8	The relief valve spring is too stiff.	Replace it.		
		9	Worn bearings.	Replace the bearing.		
		10	Damaged oil pump.	Replace or rep[air the oil pump.		
		2. En	ngine Seizure:	-		
			any 6 probable causes & remedies, 1/2		03	
		S.	Possible Causes	Remedies	00	
		N.	Evaggive heat (from muning the	Regularly changing coolant &		
			Excessive heat (from running the engine without coolant or oil).	Regularly changing coolant & maintain water level in radiator.		
		2	Neglecting oil changes (insufficient			
		~	engine oil).	the vehicle manufacturer's		
			<i>S</i> /-	recommended intervals.		
Ī	I	ı ——	1	1		



		3 Overlooking oil leaks.	Keep an eye out for oil leaks.	
		4 Ignoring the cooling system.	Check & care it regularly.	
		5 Flooding your engine driving	Avoid driving in flooded areas and	
		through standing water or even a	Accumulation of water inside the	
		heavy rainstorm.	engine.	
		6 Accumulation of rust due to the car	Keep appropriate use of the vehicle.	
		remaining unused for a long period		
		of time.		
		7 Faulty or duplicate components	Use proper genuine components &	
		used in servicing/maintenance can	service procedures.	
		fail or break.		
<b>Q.4</b>	b) ii	Describe adjustment of hydraulic brake	S.	06
	Ans.	Adjustment of Hydraulic Brakes:		
		(6 Marks for appropriate adjustment proc	edure for Hydraulic Brakes.	06
		Equivalent Credits shall be considered	for related suitable points other than	
		mentioned below.)	1	
		•	1 64 1 1 1 1	
		Due to continuous use of brakes, wear tal	-	
		linkages etc. it is necessitate periodic insp	• • • • • • • • • • • • • • • • • • • •	
		for leakages also, and to make suitable adj	ustments. The brake adjustment broadly	
		divided into two types:		
		1. Minor Adjustments		
		2. Major Adjustments		
		Minor Adjustments:	1 4	
		It mainly includes the adjustment of brake		
		done without removing the wheels. It is ge		
		linings wear faster than the rear ones bec	<u> </u>	
		one of the front brakes is removed and in	-	
		not found, the minor adjustment is usually (i) Worn out or out of round brake		
			dium	
		<ul><li>(ii) Brake lining soaked in oil</li><li>(iii) Brake lining worn up to the rive</li></ul>	t hands	
		(iii) Brake mining worn up to the rive	et neads	
		Brake pedal free play adjustment is import	ant in case of hydraulic braking system,	
		because in this, in released condition of the	e brake, the master cylinder piston cup	
		must uncover the by-pass port completely		
		due to heating on account of repeated brak	ing operations.	
		Major Adjustments:		
		It has to be done after installation of nev	y shoes or relining the old shoes or in	
		general, where minor adjustments fail to pr	_	
		To perform major brake adjustment, ren	· ·	
		linings and the drums.	and mapped	
		[1] If the drums are worn out or scored,	turn them in case the damage is within	
		limits or replace them.	case are damage is wralling	
		[2] In case of linings having reached up to	within 1 mm of the rivet head, remove	
		the same and reinstall the new ones.	I min of the first floud, fellove	
		[3] In hydraulic brakes, flush the entire bra	ke system if the color of the brake fluid	
		observed at the wheel cylinders is dark.	and System if the color of the office field	
		[4] Inspect the various components of the	master cylinder and the wheel cylinder	
		and replace the damaged ones.		



		<ul><li>[5] Thereafter, fill in sufficient quantity of brake fluid and bleed the brake system thoroughly.</li><li>[6] Then adjust the brake anchors and the shoes properly and also check the free</li></ul>	
		pedal play. If the same is not found to be within limits, adjust it.	
		(Beside this, Weightage should be given to the stepwise procedure of following	
		adjustments also, if written by examinee related with hydraulic braking system);	
		1. Brake Pedal Adjustment	
		2. Brake Shoe Adjustment	
		3. Bleeding of Brakes	
5		Attempt any FOUR of the following (4x4)	16
	a	Describe the following clutch adjustments:	
		i) Floor board clearance.	04
		ii) Release finger	04
	Ans	i) Floor board clearance:-Floor board clearance is the clearance between floor	02
		board and the clutch pedal, when the clutch pedal is at fully pressed position. This	
		adjustment can be done by means of a screw located near the lower end of the	
		clutch pedal. This screw prevents the pedal arm from resting against the floor	
		board. The screw should be so adjusted as to maintain the proper floor board	
		clearance.	
		ii) Release finger:-When the vehicle has been used for long time, the clutch	
		facing gets worn out or when clutch has been used wrongly, facing gets worn out	
		quickly. With the result that the distance between pressure plate and fly wheel	02
		dick reduces or in other words, they come closer to each other. This result in,	
		increase of distance between release bearing and clutch fingers. At that time when	
		we press clutch pedal, release bearing cannot press the fingers to the required	
		distance with result that clutch plate disengage fully. To cover up this wear of	
		facing and reduced distance between thrust bearing & fingers, the travel of release	
		is increased by the adjusting rod or release lever.	
	L		04
	b	What is Backlash? How will you check backlash by differential ring gear and pinion?	04
	Ans	Backlash:-Backlash, a clearance between meeting gear teeth, is built into the	01
		speed reducer to let the gears mesh without binding and to provide space for film	
		of lubricating oil between the teeth. This prevents overheating and teeth damage.	
		To check backlash by differential ring gear and pinion:-	
		Apply red lead paste on 3 teeth of ring gear as shown in figure. Now rotate the	
		ring gear in the direction of its rotation 4 to 5 times. When these marked teeth pass	01
		over the teeth of pinion, it leaves a contact mark as shown in figure (b) & (c). In	<b>V1</b>
		case correct contact mark is not coming, i.e. it is coming at top or bottom, right or	
		left or in one corner adjust the tooth contact by shifting the pinion in or out and/or	
		crown wheel left or right.	
1			
	1		



	(a)Proper Adjustment (b) Incorrect Adjustment (c) Incorrect Adjustment	02
С	Identify the causes and remedies of the following trouble: "vehicle doesn't	04
Ans.	move when put in gear"  Vehicle doesn't move when put in gear :-( Any Four causes and remedies 1	
Alls.	mark for each)	
	Sr. Causes Remedies	
	1 The brake may be locked up (Hand Brake Repair braking system	
	pulled, fluid contamination or a brake master	
	cylinder failure.)	
	2 Clutch plate totally worn out. Replace clutch plate	04
	Clutch doesn't engage with the fly wheel. Repair/Replace with new clutch plate	
	4 Clutch slipping. Replace clutch place	
	5 Clutch housing in the transmission fail and Repair /replace transmission	
	lock up. parts	
	6 Transmission system problem. Adjust properly	
	7 Fault in shift linkage. Adjust linkages	
	8 For automatic transmission – Refill fluid	
	Transmission fluid level is less. Repair Excessive fluid leaks.	
	Detached fluid lines.	
d	Explain meaning of 'clutch drag'. Enlist causes and suitable remedies for it.	04
Ans	Clutch drag:-A dragging clutch is one that fails to disengage the clutch disk from	02
	the flywheel when the driver pushes in the clutch pedal. When the driver attempts	
	to shift gears, he or she can't because the still-engaged clutch is still spinning along with the engine.	
	Causes and remedies:-	
	Sr. Causes Remedies	
	1 Oil or grease on the driven plate Fit new plate and eliminate oil leak	02
	facings	
	Binding of clutch pedal mechanism/ Make Free and lubricate joints.	
	Incorrect pedal adjustment. Adjust the pedal.	
	3. Weak pressure springs. Replace with new springs.  4. Incorrect setting of release levers. Reset the lever properly.	
	5. Improper clutch free play. Adjust properly.	
		04
Ans	Diagnosis the fault -'noisy differential'?  1) A "whirring" noise while decelerating at any or all speeds is most likely	U4
	caused by bad pinion bearings or loose pinion bearing preload. This condition is typically always diagnosed as a bad ring and Pinion gear.	

	1 4410	1. Check piston for wear	
	Ans	Write the procedure for inspection of master cylinder.  Procedure for inspection of master cylinder:-	<u>U4</u>
			04
6		Attempt any FOUR of the following:- (4x4)	16
		14) Use a rubbing compound to polish the paint and begin to bring out a gloss.	
		allow it to dry.	
		13) Finish sanding the car. Rinse any sanding residue from the surface and	
		12) Allow the paint to fully cure.	
		11) Spray the finish paint on the car. Prepare the paint for spraying according to manufacturer's directions.	
		acetone.	
		accumulated during priming. Wipe it using a wax and grease remover or	
		10) Clean the surface after priming to remove any dust or oil that has	
		9) Sand all primed surfaces smooth.	
		container	
		8) Allow the primer to cure thoroughly. Check the information on the	
		removed all paint down to bare metal.	
		overspray to get through.  7) Prime the surface with a corrosion resistant, self-etching primer if you have	
		that there are no holes in the masking tape and paper that will allow	
		including glass, window trim, door handles, mirrors, and grills. Make sure	
		6) Use masking tape and paper to cover all surfaces not to be painted,	
		body oils from fingers and hands) are on the car.	
		using mineral spirits or denatured alcohol to make sure no oils (including	
		sufficiently for the new paint to adhere to. Clean all surfaces thoroughly;	
		5) Sand the paint either to the bare metal, the original primer, or at least	04
		4) Remove any chrome or plastic trim.	
		3) Remove rust from surface to be painted and repair dents.	
		2) Gather the materials and equipment which are essential for painting of car like-Paint, Sanding and polishing tools and supplies, Safety equipment.	
		good lighting, electricity, and room to work around the vehicle.	
		1) Find a suitable place for painting with excellent ventilation, minimal dust,	
	Ans	Procedure of repainting of car:-	
	f	Describe procedure of repainting of car?	04
	r	parts.	0.4
		might be loose yokes, bad u-joints or worn transfer case or transmission	
		8) "Clunking or clicking" when starting to move or getting on and off the gas	
		worn u-joints or an out of balance driveshaft.	
		7) A steady vibration that increases with the vehicle's speed can be caused by	
		6) A "Rumble" while cornering or turning may indicate bad wheel bearings.	
		reaction lubrication, or worn post reaction clutches.	
		cornering gears commonly called "spider gears", lack of sufficient post	
		broken ring or pinion gear tooth. 5) "Banging, clicking or clunking" while cornering can be caused by broken	
		4) Regular "clunking" or loud "clicking" every few feet may indicate a	
		carrier bearings. The noise may change while cornering or turning.	04
		<ul><li>2) A "howl or whine" during acceleration over a small or large speed range is usually caused by worn ring and pinion gears or improper gear set up.</li><li>3) Rumbling or whirring" at speeds over 20 mph can be caused by worn</li></ul>	



	2. Inspect rubber valve seat, Rubber boot, stop washer, primary cup and	***
	secondary cup for cracks.	0.4
	3. Inspect body of master cylinder for wear, corrosion.	04
	4. Inspect spring for tension.	
	5. Inspect filler plug for wear.	
	6. Inspect push rod for wear.	
	7. Inspect circlip for damage	
b	Write any four points to be consider in taking care of wheels and tyre.	04
Ans	(1 mark for each point)	
	Care of Wheels and tyre:-	
	1) Avoid overloading.	
	2) Place the load at centre of the vehicle body.	04
	3) Inflate the tyre to correct pressure.	0.
	4) Do not run with flat tyre.	
	5) Avoid sudden starting acceleration.	
	6) Avoid sudden braking and cornering.	
	7) Keep tyre away from oil and grease.	
	8) Avoid fast running on rough road.	
	9) Do the wheel alignment and wheel balancing.	
	10) Avoid road edge driving.	
	11) Take preventive measures if the vehicle is kept idle for long time.	
С	Describe how will you remove cracks in chassis frame?	04
Ans	Cracks: Cracks can be detected by inspecting the chassis carefully. If it is not	
	visible, wash the chassis first, then coat the surface with a solution of chalk and	
	water. When it becomes dry, tap the area with a hammer then the crack will be	
	visible. In case, the crack is observed, it should be immediately repaired. In case	02
	the repair facilities do not exist, then drill 5 to 6 mm diameter hole at the end of	02
	cracks as shown in figure. This drilling of hole will stop further expansion of	
	crack. The holes work like the first aid for the crack.	
	5 mm	01
	5 mm	01
	2 to 3 mm	01
	2 to 3 mm	01
	Fig. Drilling hole at the end of crack Fig. Making "V" groove for	01
	Fig. Drilling hole at the end of crack Fig. Making "V" groove for welding	01
	Fig. Drilling hole at the end of crack Fig. Making "V" groove for welding To remove cracks following procedure is adopted:	01
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	Fig. Drilling hole at the end of crack Fig. Making "V" groove for welding  To remove cracks following procedure is adopted:  1. For welding the chassis make a groove of 2 to 3 mm in the crack at bottom portion and chamfer the upper end of the groove to make a V shape. Weld	
	Fig. Drilling hole at the end of crack Fig. Making "V" groove for welding  To remove cracks following procedure is adopted:  1. For welding the chassis make a groove of 2 to 3 mm in the crack at bottom portion and chamfer the upper end of the groove to make a V shape. Weld a groove with at least 3 layers. After welding, it is cooled down, then grid	01
	Fig. Drilling hole at the end of crack Fig. Making "V" groove for welding  To remove cracks following procedure is adopted:  1. For welding the chassis make a groove of 2 to 3 mm in the crack at bottom portion and chamfer the upper end of the groove to make a V shape. Weld a groove with at least 3 layers. After welding, it is cooled down, then grid the surface to make it smooth.	
	Fig. Drilling hole at the end of crack Fig. Making "V" groove for welding  To remove cracks following procedure is adopted:  1. For welding the chassis make a groove of 2 to 3 mm in the crack at bottom portion and chamfer the upper end of the groove to make a V shape. Weld a groove with at least 3 layers. After welding, it is cooled down, then grid the surface to make it smooth.  2. Considering second case. If crack is more than ½ of chassis cross-section,	
	Fig. Drilling hole at the end of crack Fig. Making "V" groove for welding  To remove cracks following procedure is adopted:  1. For welding the chassis make a groove of 2 to 3 mm in the crack at bottom portion and chamfer the upper end of the groove to make a V shape. Weld a groove with at least 3 layers. After welding, it is cooled down, then grid the surface to make it smooth.	



d	Explain the procedure for tyre retreading?	04
Ans	Procedure for tyre retreading	
Ans	<ol> <li>Inspection: Tyre will be inspected carefully to show up puncture, cracks, wears and any other damage on the tyre in retreading unit. Mechanic or technicians check the whole tyre and come to point if it is to be retreaded or not.</li> <li>Buffing: Tyre casing are buffed by inflated and using same size of rim as in original use. On lathe machine to assure proper radiation profile, less rubber is removed and under thread, rubber compound remain safe for giving extra protection to plies. This result in perfectly round and balanced tyre.</li> <li>Cementing: After buffing tyre is sprayed with rubber compound.</li> <li>Tread Preparation: After cementing tyre is prepared for tread design. For that purpose solution of cushion gum is applied on a tyre. When this is cured, the rubber material becomes strongest part of the tyre.</li> <li>Tread bonding: The rubber, newly coated with cushion gum is applied to the tyres on a special tyre builder. The tyre is kept in an inflated condition</li> </ol>	04
	<ul> <li>on the same size rim as originally in use during this operation.</li> <li>Enveloping: This is method to bond the tyre properly, that means, in this stage uniform pressure is applied at all points on the tread and it gives perfect bonding of the tread.</li> <li>Curing: The tyre is then placed in the hot retreading machine-segmented mould retreading machine. During this processing, the tyre tread are to be printed by the flower patterns of machine mould. After vulcanization, the new retreaded tyre is taking shape. It is new tyre and have own brand.</li> <li>Final inspection: The retreaded tyre is subjected to a final inspection.</li> </ul>	
e	This inspection insures that only tyres which meet the industry quality standards are allowed to leave the retread plant.  Write causes and remedies for following painting defects: (1)Runs and sags (ii)Cracks	04



Sr.	Causes		Remedies
1	Too heavy application of film	Appl	y required film
2	Excessive or improper reducer/thinner	Use 1	esser amount and or faster
	had been added to the paint	solve	
3	Various components have been	Mate	rials should be mixed in
	improperly mixed		dance with the application actions
4	Incorrect or a lack of curing agent had been used	Add (	Correct amount of curing agents
5	The object being painted was too cold	Chec	k application instructions and
			ove the climatically conditions
6	Improper spraying technique was used,	Impro	ove the spraying technique. Use
	such as but not limited to:	the ri	ght distance of 20-25 cm from
	Spray gun was held to close to the	objec	t and nozzle and a right angle to
	surface	the su	urface. Use a 50% overlap with
	Too much pressure on the pot or gun	each	pass per application.
	Dirty air cap		
	Inconsistent movements		
7	life of catalyzed material has been exceeded	Selec	t proper catalyzed material
ii) (	Crack( any two 1 mark for each)		
Sr.	Causes		Remedies
1	Too heavy of film of lacquer top-coat		Apply required film of lacquer
			top-coat
2	Sudden temperature changes the surface	has	Temperature of surface has to
	to be sanded and refinished.		be maintained.
3	Refinished paintwork insufficiently cure little or no hardener used)	ed (too	Ensure correct hardener quantities
4	Inappropriate paint system used:		Use correct paint system
	Wash primer over coated with polyester		
	products		
	Synthetic resin or nitro-cellulose paints	over	
	coated too early		