

# AUTO BODY REPAIRS AND SPRAY PAINTING

## SCHEME OF EXAMINATION

There will be three papers, Papers 1, 2 and 3 all of which must be taken. Papers 1 and 2 will be a composite paper to be taken at one sitting.

- Paper 1: will consist of forty multiple-choice objective questions all of which are to be answered in 1 hour for 40 marks.
- Paper 2: will consist of five essay questions. Candidates will be required to answer any four in 1<sup>1</sup>/<sub>2</sub> hours for 60 marks.
- Paper 3: will be a practical test of 3 hours, 10 minutes duration. It will consist of one compulsory question for 100 marks.

A list of materials for the test shall be made available to schools not less than two weeks before the paper is taken for material procurement and relevant preparations.

#### ALTERNATIVE TO PRACTICAL TEST

Alternatively, in the event that materials for the actual practical test cannot be acquired, the Council may consider testing theoretically, candidates' level of acquisition of the practical skills prescribed in the syllabus. For this alternative test, there will be one question to be answered in 3 hours for 100 marks.



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# **DETAILED SYLLABUS**



5/INU.	IUPIC		CUNTENI		rautical
S/NO.	ТОРІС	1.6	Factory acts on safety rules and regulations: 1984 amended resource conservation recovery act, environmental protection agency regulations and hazardous waste collection and recycling (solvent recovery system).		PRACTICAL
		1.5	Sources of accident (human factors, machinery/equipment and workshop keeping) and their preventions.		machines/ equipment
		1.4	Auto body dressing code: personal protective equipment (nose mask, goggles, boots, ear defender, etc).	1:4:1	Identification of dress code and protective equipment and demonstration of their usage.
	spray painting.	1.3	List of safety tools and equipment/machines for auto body repairs.	1:3:1 equip	Identification of safety tools and ment and demonstration of their usage.
1.	Safety rules and regulations in Auto body repairs and	1	regulations in auto body repairs and spray painting. List of rules and regulations and their importance.		
1.		1.1	Definition of safety rules and		



2	Too	ls and Equipment				
	(a)	Basic Hand Tools	2.1	Types of hand tools. (hammers, dollies, spanner, files, ratchets, body spoons, etc) and their uses.	2:1:1	Identification of hand tools and equipment
			2.2	Types and uses of power tools and equipment/machines (drilling machine, body jack, sanders, air compressor, shaping machines, cutting machine, etc).	2:2:1	Identification and demonstration of the use of power tools.
			2.3	Advantages and disadvantages of machines.		
	(b)	Spray painting tools	2.4	Uses of machines and safety precautions.	2:4:1	Demonstration of the use of machine.
		and equipment.	2.5	Spray painting tools and equipment (scrapers, brushes, funnels, paint pots, spray gun, spraybody filters, air compressor, oven, spray boot, etc).	2:5:1 and	identification of spray painting tools, equipment their uses.
	(c)	Care and maintenance of tools and equipment.	2.6	Definition of maintenance and types – predictive, preventive and corrective.		
			2.7	Manufacturer's maintenance guide.	2:8:1	Dismantling and assembly of a
	2.3	2.8	Maintenance of tools and equipment.	2:8:2	spray gun Cleaning of tools and equipment	



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3.	Materials for auto-body repairs and spray painting (a) Auto-body Repairs materials.	<ul> <li>3.1 Types of body filler</li> <li>plastic filler;</li> <li>fibreglass fillers;</li> <li>body solder; 30/70 and 40/60.</li> </ul>	3:1:1 Identification of body fillers.
		3.2 Type of body abrasives e.g. sand papers, (wet and dry); Sanding disc.	3:2:1 Identification of body abrasives.
		3.3 Type of sealers e.g. rubber sealers, seam sealers, undercoating, etc.	3:4:1 Demonstration of
		3.4. Rivet pins e.g. pop and solid rivets.	<ul> <li>the use of rivet gun.</li> <li>3:5:1 Identification of paints by use of thinner.</li> </ul>
	(b) Spray painting materials.	3.5 Types of paints – Enamel paints and lacquers.	3:5:2 Demonstration of the use of under coats.
		<ul> <li>Under coats: surface primer, putty/body filler, sealers.</li> <li>Top coats: lacquers and enamel</li> </ul>	3:5:3 Demonstration of those of top coats.
		paints.	3:6:1 Demonstration of how to mix paints
		3.6 Manufactures paint guide: paint formula, paint mixing equipment, custom-mix basecolours, paint labels, colour charts.	3:6:2 Identification of colours using colour chats



4.	Type of metals.	4.1 Ferrous and non ferrous metals – mild teel, cast iron, aluminium, brass, etc.	4:1:1 Identification of ferrous and non- ferrous metals.
		4.2 Properties of metals – fusibility, maleability, ductility, weldability, etc.	4:1:2 Demonstration of properties of metals.
		4.3 Uses of metals on Auto bodies.	
5	Heat treatment of metals.	5.1 Definition of heat treatment.	
		<ul> <li>5.2 Types and process of heat treatment e.g. hardening, annealing, normalizing, case- hardening and tempering.</li> <li>5.3 Importance of heat treatment.</li> </ul>	5:2:1 Demonstration of heat treatment processes.



6.	Oxy-acetylene welding and equipment.	Definition of oxy-acetyler welding.	ne
		Safety precautions	
		Oxy-acetylene welding equipment.	6:3:1 Identification of equipment.
		Types of oxy-acetylene ga e.g.(high and low pressure system).	
		Installations of welding equipment.	6:5:1 Demonstration of how to assemble welding equipment.
		Welding nozzles.	6:6:1 Demonstration of how to install
		Defects of oxy-acetylene – slag inclusion, porosity lack of penetration, etc an their remedies.	v, crack, weld defects.
7	<ul><li>Auto body repair work</li><li>(a) Minor auto body repair.</li></ul>	Types of auto body (i) integral body; (ii) composite body.	7:1:1 Identification of integral and composite bodies.
		Basic methods of straighte auto body: aligning the m with power jack, pulling with sledge hammer, usin bar, pulling the metal with taps. Heat-shrinking the n bring the metal back to it original shape.	netalauto- body repairthe metaltools.g pre-7:2:2n pullheat shrinkingnetal totools.
		Tools used in-minor repa hammers, hand dollies, s	



		spanners, screw drivers, etc.	tools in carrying out minor repairs.
	(b) Major auto body repair.	<ul> <li>7.4 Major body sections e.g. front engine compartment, passenger section, rear section</li> <li>7.5 Designation end principale</li> </ul>	7:4:1 Identification of major body sections.
		<ul><li>7.5 Basic alignment principle.</li><li>7.6 Quarter panel cutting.</li></ul>	7:6:1 Identification of quarter panel and demonstration of how to cut it.
		7.7 Light weight panels.	7:7:1 Repair and aligning of body
		7.8 Damaged vehicle alignment.	sections.
8.	Aluminum panel repair.	8.1 Steps involved in aluminum panel repair.	8:2:1 Demonstration of how to repair and
		8.2 Repair and alignment of	align aluminum
		damaged aluminum panel. 8.3 Aluminum deck lid repair.	panel. 8:3:1 Aluminum deck lid repair procedure
9.	Plastic repairs.	9.1 Precautions while working with plastics.	
		9.2 Types of plastic resins (thermosetting and thermoplastic).	9:2:1 Identification of plastics.
		9.3 Repair of plastic parts by melting.	9:3:1 Demonstration of how to repair
	2	9.4 Introduction to glass fibre panel repair.	plastics parts by melting.
10.	<ul><li>Spray painting:</li><li>(a) Spray gun and accessories.</li></ul>	10.1 Spray gun – pressure feed gun siphon and gravity gun.	10:1:1 Identification of pressure feed gun, siphon gun
	10.	10.2 Spray gun parts – air cap, fluid needle, air valve, trigger gun, body, cup, etc.	and gravity gun.
		10.3 Precautions in the use of spray gun.	
		10.4 Manufacturer's maintenance	



	(b) Surface preparation.	10.5	guide. Preparation of surfaces for spray painting.	10:5:1	Preparation of metal surfaces for spray painting.
	(c) Type of paints.	10.6	Paints used on auto bodies cellulose synthetic paint, enamel	10:6:1	Identification of paints used on auto bodies.
	(d) Metallic paint.	10.7 10.8	paint, acrylic, metallic paints, etc. Importance of manufacturer's paint code. Special paints and their importance.		
		10.9 10.10	Variable agents (flakes and pigments).	10:10:1	Demonstration of metallic spray techniques.
11.	Auto body workshop business.	11.1	Factors to consider in locating auto body repair shop – capital, accessibility, land, etc.		
		11.2	List of tools and equipment.		

## **RECOMMENDED READING LIST**

- 1. The repair of vehicle bodies by Alan Robinson (3<sup>rd</sup> Edition).
- 2. Fundamentals of vehicle body work by J. Fairbrother.
- 3. Practical welding (The motivate series Mac-Milan texts for Industrial Vocational and Technical Education) by S. Gibson.
- 4. Fundamentals of motor vehicle technology, chassis and body electronics (5<sup>th</sup> Edition) Book 1, 2, and 3 by Hilliers V. A. W. and David R. Rogers.
- 5. Bodywork Maintenance and repair including interiors by Paul Browne.



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- 6. Automotive encyclopedia by Good heart-Willcox.
- 7. Auto body repair and repainting by Bill Tobold.