



Skill India
कौशल भारत - कुशल भारत



Sample Test Project

Automobile Technology

Category: Transportation & Logistics

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Section - A

A. Preface

Skill Explained:

Automobile Technology skill is related with servicing, diagnosis and repair of light motor vehicles, such as cars and utility vehicles. The trained and competent Light Vehicle Automobile Technician carries out servicing and repairs a range of light vehicles. The carry out diagnosis, repair and replacement, depending on the manufacturers' equipment, parts, materials, and procedures. The highly skilled Automobile Technician keeps abreast with continuous changes in the sector. The technician is required to possess kinesthetic skills, and be versatile to take on the complex diagnostic tasks in advanced vehicles, and those incorporating the latest technologies.

Eligibility Criteria (for IndiaSkills 2018 and WorldSkills 2019):

Competitors born on or after 01 Jan 1997 are only eligible to attend the Competition.

Standard Specifications:

- Work organization and management
- Communication and interpersonal skills
- Electrical and mechanical systems, and their integration
- Inspection and diagnosis
- Repair, overhaul, and service

Section - B

Test Project

MODULE A – ENGINE Management SYSTEM

EQUIPMENT

- TATA Tiago Petrol
- Digital multimeter
- manufacturers information – wiring diagram and service manual
- Hand tools provided within the toolbox
- Diagnostic tool

INSTRUCTIONS

- START THE ENGINE AND TUNE TO BEST POSSIBLE OPERATING CONDITION.
- Record onto the report sheet a brief description of any faults identified

TIME ALLOWED 3 Hours

COMPETITOR NAME	STATE	MODULE	TRANSLATION LANGUAGE
		A	

	INSTRUCTIONS	POSSIBLE MARKS	TRANSLATION
A1	Safe work area, correct use of tools and equipment	1.50	
A2	Accurate description of faults on report sheet.	2.0	
A3	System comprehension. Correct use of technical information	2.0	
A4	Inspect and Diagnosis the Engine Management System	18.0	
A5	Replace defective components, Repair faults	1.5	
		MAX 25	

MODULE B – BODY ELECTRICAL

EQUIPMENT

- Mahindra XUV500
- Digital multimeter
- manufacturers information – wiring diagram and service manual
- Handtools provided within the toolbox
- Diagnostic tool

INSTRUCTIONS

- VEHICLE IS HAVING FOLLOWING PROBLEMS. REPAIR THESE FAULTS :
- FR. RH HEADLAMPS ARE NOT WORKING
- DRIVER SIDE POWER WINDOW IS NOT WORKING
- INTERIOR LAMPS ARE NOT WORKING
- DOOR LOCKING OF RR RH DOOR IS NOT WORKING
- Record onto the report sheet a brief description of any faults identified

TIME ALLOWED 3 Hours

COMPETITOR NAME	STATE	MODULE	TRANSLATION LANGUAGE
		A	

INSTRUCTIONS		POSSIBLE MARKS	TRANSLATION
B1	Safe work area, correct use of tools and equipment	1.50	
B2	Accurate description of faults on report sheet.	2.0	
B3	System comprehension. Correct use of technical information	2.0	
B4	Inspect and Diagnosis the Body Electrical System	18.0	
B5	Replace defective components, Repair faults	1.5	
		MAX 25	

MODULE C – BRAKES, STEERING, SUSPENSION AND WHEEL ALIGNMENT

EQUIPMENT: HYUNDAI i20 Elite

Instructions

- Perform wheel alignment according to manufacturer's specifications. print out report sheet of wheel alignment.
- Share all your observations with expert.
- Replace only the identified defective parts as mentioned below :
- Remove , dismantle and refit fr. rh strut
- Remove and refit fr lh lower arm
- Check thickness of rr rh brake shoes

TIME ALLOWED 3 Hours

COMPETITOR NAME	COUNTRY CODE	MODULE	TRANSLATION LANGUAGE
		C	

	INSTRUCTIONS	POSSIBLE MARKS	TRANSLATION
C1	Work Organization and Management, Safety	2.5	
C2	Perform wheel alignment & print report sheet	5	
C3	Replace faulty components as mentioned above	17.5	
		MAX 25	

MODULE D – ENGINE MECHANICAL

EQUIPMENT: MARUTI SUZUKI K12M engine

Instructions

DISMANTLE THE ENGINE AND PERFORM FOLLOWING MEASUREMENTS :

1. CHECK CRANK SHAFT END PLAY
2. MEASURE PISTON OD OF PISTON NO. 1
3. MEASURE TAPER & OVALITY OF CYL NO. 1
4. CALCULATE PISTON TO BORE CLEARANCE FOR CYL NO.1
5. MEASURE CRANK PIN OD FOR 1ST CYLINDER
6. MEASURE CAM LOBE HEIGHT OF FIRST 4 CAM LOBES
7. MEASURE CAM SHAFT 1ST JOURNAL OD
8. MEASURE CYLINDER HEAD BOLT HEIGHT (ANY ONE)

ASSEMBLE THE ENGINE.

TIME ALLOWED 3 Hours

COMPETITOR NAME	COUNTRY CODE	MODULE	TRANSLATION LANGUAGE
		D	

	INSTRUCTIONS	POSSIBLE MARKS	TRANSLATION
D1	Work Organization and Management, Safety	2.5	
D2	Engine dismantling	8	
D3	Measurements	6.5	
D4	Engine assembly	8	
		MAX 25	

Section – C

C. Marking Scheme

Marking Scheme: The Assessment is done by awarding points by adopting two methods, Measurement and Judgments

- Measurement –One which is measurable
- Judgment-Based on Industry expectations

Aspects are criterias which are judged for assessment.

Final marking will be based on the outcomes, such as;

- Candidate in position to operate productive equipment's.
- Candidate understands manual and circuit diagrams.
- Candidates have good knowledge of special tool and measuring instruments.
- Candidate is in position to diagnose the technical problem in car & engine and is able to rectify the problem in a qualitative manner.

Assessment and Marking of Test Projects

The maximum marks for each project will be 15 for Regional level. The same will be allocated under the heads of Measurement and Judgment. For Judgement, marks will be awarded from 3 for each aspect as under;

- 0: performance below industry standard
- 1: performance meets industry standard
- 2: performance mostly meets industry standard and exceeds industry standards sometimes
- 3: excellent or outstanding performance

Example-Judgment Marking

If maximum marks for Judgement criteria are 1 and if all 3 Experts (Juries) give 3 points to a candidate, the candidate will get 1 mark for that aspect. If 2 Experts give 3 and 1 Expert gives 2 points, then candidate will get $(2+2+1/9)*1 = 0.55$ marks for that aspect (out of 1).

For Measurement marking, maximum marks for each aspect should not be more than 2% of maximum marks. Since maximum marks for each module are 10, so mark for each aspect cannot be more than 0.2. Candidate will be awarded either full marks or zero against each aspect.

Note:

The Test Projects and Marking Scheme will be decided by the Experts (jury members) prior to competition, based on actual resources being used in the competition.

Section - D

D. Infrastructure List

- Workshop Installation-Tools & Equipment positioned by Organizers
- Tool Kit-Tool & Equipment allowed to be brought by competitors for competitions

For Automobile Technology skill, all tools and equipment are provided by competition organizer- including safety PPEs. (Candidate should bring safety shoes).

Summary of tools and equipments for 'Electrical Fault Finding' module:

- Digital multimeter
- Diagnostic software
- General tools set
- Safety PPEs – as per details given in Section E.

Summary of tools and equipments for 'Engine Mechanical' module:

- General tools set
- Special tools – Crankshaft, Camlock, Cranklock, Torx Male & Female socket set (Specific)
- Torque wrenches
- Micrometer screw gauge, Dial Bore Gauge, Vernier caliper, Dial gauge, Magnetic stand
- Feeler gauge
- Piston ring compressor
- Piston ring expander
- Safety PPEs – as per details given in Section F.

Note: Exact requirement depends on tasks and resources used during competition.

Section – E

E. Instructions for candidates

The participating Competitors must ensure:

- Candidate should perform each and every task with proper PPE.
- Candidate should report on given time at test centre.
- Candidate will not get any addition time for completing the task.
- Candidate can ask for any special tool if required.
- Candidates are not allowed to use any kind of unfair means during the test.
- Candidates must follow the instruction given by examiner.
- No electronic devices like mobile, calculator permitted.
- Make sure all tools available are in proper condition before starting test.
- Candidates must be careful while handling tools and machines.
- Handle the fluids carefully like engine oil, coolant etc.

Section – F

F. Health, Safety, and Environment

1. All accredited participants and supporting volunteers will abide by rules and regulations with regards to Health, Safety, and Environment of the Competition venue.
2. All participants, technicians and supporting staff will wear the required protective personnel clothing.
3. All participants will assume liability for all risks of injury and damage to property, loss of property, which might be associated with or result from participation in the event. The organizers will not be liable for any damage, however in case of Injury the competitor will immediately inform the immediate organizer for medical attention.
4. The following table shows the minimum regulations for skill-specific Health, Safety, and Environment Personal Protective Equipment that must be worn for the itemized tasks carried out in the workshop.

TASK	TIGHT FITTING WORK UNIFORM (LONG TROUSERS)	SAFETY SHOES WITH PROTECTIVE CAP	STURDY SHOES WITH CLOSED TOE AND HEEL	HEARING PROTECTION	LATEX GLOVES
General PPE for safe areas			X		
For all workstations	X	X			
Module E Transmission	X	X		X	X
Module B Steering/Brakes	X	X		X	X

5. Work clothes must comply with relevant best practices in Automobile industry.
6. All machinery and/or equipment must comply with the mandatory safety requirements.
7. Competitors must keep their work area clear of obstacles and their floor area clear of any material, equipment or items likely to cause someone to trip, slip or fall;
8. All Competitors must wear PPE at all times in the workshop area;
9. Experts will use the appropriate personal protective equipment when inspecting, checking or working with a Competitor's project.
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Details of necessary protective clothing & Vehicle Protective Covers:

The following table shows the list of items to be used for protection of vehicle and as PPE's

Vehicle Protective Cover	Personal Protective Equipment's
Seat cover	Belt cover
Fender cover	Wrist watch cover
Steering wheel cover	Helmets
Gear lever cover	Goggles
	Hand gloves
	Aprons
	Ear plugs