



Skill India
कौशल भारत - कुशल भारत



Sample Test Project

District / Zonal Skill Competitions

Skill- Plumbing and Heating

Category: Construction and Building Technology

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Section - A

A. Preface

Skill Explained:

A plumbing and heating technician works on commercial, residential, agricultural and industrial projects. There is a direct relationship between the nature and quality of the product required and the payment made by the customer. Therefore the practitioner has a continuing responsibility to work professionally in order to meet the requirements of the customer and thus maintain and grow the business. Plumbing and heating is closely associated with other parts of the construction industry, and with the many products that support it, normally for commercial purposes

Eligibility Criteria (for IndiaSkills 2018 and WorldSkills 2019):

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

Total Duration: 5 Hrs

Section – C

C. Marking Scheme

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

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

Aspects are criteria's which are judged for assessment

Assessment and Marking of Test Projects

The maximum marks for each project will be 100. The same will be allocated under the heads of Measurement and Judgment with marks awarded from 3 for each aspect as under;

- 0: performance below industry standard
- 1: performance meets industry standard
- 2: performance meets industry standard
- 3: excellent or outstanding performance

Note: The criteria will be decided by the jury member during the Workshop.

Measurement is used to assess accuracy, precision, and other performance which can be measured in unambiguous way. Mark is awarded in full for a dimension with in tolerance and zero when it is out of tolerance.

Judgment is used to assess the quality of performance, about which there may be small differences of opinion.

The scores from 0 to 3 are awarded for conformity with industry standards (score 1 stands for 1/3 and score 2 for 2/3 of the maximum mark allotted for the criterion).

Example-Judgment Marking

If maximum marks for Judgment criteria is 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 $(3+3+2)/9 \times 1 = 0.89$ marks for that aspect out of 1 mark.

Marking Scheme

Skill Competition

Assessment Criterion:

Subjective Test Module

Plumbing & Heating

Competitor Team No

Competitors Name

Plumber :

Aspect ID	Aspect Type (Measure (M)/ Judge(J))	Aspect of Criterion - Description	Max Marks for Aspect	Result or actual value	Mark Awarded
1 - Health & Safety	Total Marks of Aspect - 18				
1.1	M	No breaches and maintains a tidy workspace. (Any breach of conduct must be confirmed by at least 2 experts and recorded in a skill log book.) - No Breaches and Tidy Workplace = Full marks, No breach but untidy = Half marks, Breach & Untidy = Zero	2		
1.2	M	Competitor has worn all safety gear (safety shoes, safety glasses, long sleeves, gloves - some tasks may require gloves to be taken off) as required for the task. (Any non-compliance of safety gear after one warning to be confirmed and accepted by at least 2 experts and recorded in a skill log book.) - All safety gear used correctly throughout = Full marks, Safety gear taken off during process = Half marks, No safety gear or gear missing or used incorrectly = Zero	2.5		
1.3	M	Competitor uses the right tools and does not use any tools which are non-standardised, templates or provides an additional edge over other competitors. (Any usage of wrong tools to be confirmed and accepted by at least 2 experts and recorded in a skill log book.) - Uses the right tools in the correct method throughout = Full marks, Uses improper tool or in the wrong method for one instance = Half marks, No proper tools or	3		

		usage improperly more than once = Zero			
1.4	M	No breaches and maintains a tidy workspace. (Any breach of conduct must be confirmed by at least 2 experts and recorded in a skill log book.) - No Breaches and Tidy Workplace = Full marks, No breach but untidy = Half marks, Breach & Untidy = Zero	2		
1.5	M	Competitor has worn all safety gear (safety shoes, safety glasses, long sleeves, gloves - some tasks may require gloves to be taken off) as required for the task. (Any non-compliance of safety gear after one warning to be confirmed and accepted by at least 2 experts and recorded in a skill log book.) - All safety gear used correctly throughout = Full marks, Safety gear taken off during process = Half marks, No safety gear or gear missing or used incorrectly = Zero	2.5		
1.6	M	Competitor uses the right tools and does not use any tools which are non-standardised, templates or provides an additional edge over other competitors. (Any usage of wrong tools to be confirmed and accepted by at least 2 experts and recorded in a skill log book.) - Uses the right tools in the correct method throughout = Full marks, Uses improper tool or in the wrong method for one instance = Half marks, No proper tools or usage improperly more than once = Zero	3		

1.7	M	Are on the Installation area any wrong holes, drill marks or helplines visible? (Any improper holes, improper drill marks or unused screw holes or lines made for help visible?) - No = Full marks, Yes = Zero	3		
2 - Installation and Joints	Total Marks of Aspect - 20	Position of location and angle for assessment of this criteria will be selected by draw at random before the start of the assessment.			
2.1	M	Plumb & Level 1- Selected fitting position as per the design provided. (Position location for assessment will be selected by draw at random before the start of the assessment of that criterion) - Dimension +-2mm = full marks, Dimension +-4mm = half marks, Dimension beyond 4 mm = zero marks.	2		
2.2	M	Plumb & Level 2- Selected fitting position as per the design provided. (Position location for assessment will be selected by draw at random before the start of the assessment of that criterion) - Dimension +-2mm = full marks, Dimension +-4mm = half marks, Dimension beyond 4 mm = zero marks.	2		
2.3	M	Plumb & Level 3- Selected fitting position as per the design provided. (Position location for assessment will be selected by draw at random before the start of the assessment of that criterion) - Dimension +-2mm = full marks, Dimension +-4mm = half marks, Dimension beyond 4 mm = zero marks.	2		

2.4	M	Plumb & Level 4- Selected fitting position as per the design provided. (Position location for assessment will be selected by draw at random before the start of the assessment of that criterion) - Dimension +-2mm = full marks, Dimension +-4mm = half marks, Dimension beyond 4 mm = zero marks.	2		
2.5	M	Plumb & Level 5- Selected fitting position as per the design provided. (Position location for assessment will be selected by draw at random before the start of the assessment of that criterion) - Dimension +-2mm = full marks, Dimension +-4mm = half marks, Dimension beyond 4 mm = zero marks.	2		
2.6	M	Gradient & Angle 1- Selected fitting angle as per the design provided. Angle for assessment will be selected by draw at random before the start of the assessment of that criterion) - Angle 0° up to 1° = full marks, Angle 1° up to 2° = half marks, Angle beyond 2° mm = zero marks.	2		
2.7	M	Gradient & Angle 2- Selected fitting angle as per the design provided. Angle for assessment will be selected by draw at random before the start of the assessment of that criterion) - Angle 0° up to 1° = full marks, Angle 1° up to 2° = half marks, Angle beyond 2° mm = zero marks.	2		

2.8	M	Gradient & Angle 3- Selected fitting angle as per the design provided. Angle for assessment will be selected by draw at random before the start of the assessment of that criterion) - Angle 0° up to 1° = full marks, Angle 1° up to 2° = half marks, Angle beyond 2° mm = zero marks.	2		
2.9	M	Gradient & Angle 4- Selected fitting angle as per the design provided. Angle for assessment will be selected by draw at random before the start of the assessment of that criterion) - Angle 0° up to 1° = full marks, Angle 1° up to 2° = half marks, Angle beyond 2° mm = zero marks.	2		
2.10	M	Gradient & Angle 5- Selected fitting angle as per the design provided. Angle for assessment will be selected by draw at random before the start of the assessment of that criterion) - Angle 0° up to 1° = full marks, Angle 1° up to 2° = half marks, Angle beyond 2° mm = zero marks.	2		
3 - Fixtures and Fittings	Total Marks of Aspect - 20	Four fittings for assessment of this criteria will be selected by draw at random before the start of the assessment.			
3.1	J	Marks on Fittings - Are the fittings installed correctly without any tool marks on them. No tool marks = Full Marks, One or two tool marks = Half Marks, More than two tool marks per fitting = zero marks	5		
3.2	J	Marks on Fittings - Are the fittings installed correctly without any tool marks on them. No tool marks = Full Marks, One or two tool marks = Half Marks, More than two tool marks per fitting = zero marks	5		

3.3	M	Improper Fitting Installation - Is the pipe inserted properly into the fitting? Yes = Full Marks, No = Zero Marks	5		
3.4	M	Improper Fitting Installation - Is the pipe inserted properly into the fitting? Yes = Full Marks, No = Zero Marks	5		
4 - Quality of Joints	Total Marks of Aspect - 12	Fittings selected in the criteria 3 get assessed for joint quality			
4.1	J	Fitting 1 Joints - Is the quality of the joint of the fitting as required? Any excess solvent present? Any gaps visible in the joints or solvent application? Better than Industry Standard = Full Marks, Meets industry std = 2 Marks, One drop of solvent seen = 1 Mark, Too much or too little solvent seen = 0	3		
4.2	J	Fitting 2 Joints - Is the quality of the joint of the fitting as required? Any excess solvent present? Any gaps visible in the joints or solvent application? Better than Industry Standard = Full Marks, Meets industry std = 2 Marks, One drop of solvent seen = 1 Mark, Too much or too little solvent seen = 0	3		
4.3	J	Fitting 3 Joints - Is the quality of the joint of the fitting as required? Any excess solvent present? Any gaps visible in the joints or solvent application? Better than Industry Standard = Full Marks, Meets industry std = 2 Marks, One drop of solvent seen = 1 Mark, Too much or too little solvent seen = 0	3		

4.4	J	Fitting 4 Joints - Is the quality of the joint of the fitting as required? Any excess solvent present? Any gaps visible in the joints or solvent application? Better than Industry Standard = Full Marks, Meets industry std = 2 Marks, One drop of solvent seen = 1 Mark, Too much or too little solvent seen = 0	3		
5 - Pipe Dimensions	Total Marks of Aspect - 18	Three Pipe Lengths for assessment of this criteria will be selected by draw at random before the start of the assessment.			
5.1	M	Dimension 1 - Is the dimension of the selected pipe length as per the drawing / design provided? Dimension +- 2mm = Full marks, Dimension +- 4mm = Half marks, Beyond 5mm=Zero marks	6		
5.2	M	Dimension 2 - Is the dimension of the selected pipe length as per the drawing / design provided? Dimension +- 2mm = Full marks, Dimension +- 4mm = Half marks, Beyond 5mm=Zero marks	6		
5.3	M	Dimension 3 - Is the dimension of the selected pipe length as per the drawing / design provided? Dimension +- 2mm = Full marks, Dimension +- 4mm = Half marks, Beyond 5mm=Zero marks	6		
6 - Completion & Handover	Total Marks of Aspect - 12				
6.1	M	Does the installation look like the provided drawing / design? Yes = Full Marks, No = Zero Marks	3		
6.2	M	Are all pipe diameters as required? Yes = Full Marks, No = Zero Marks	3		

6.3	M	Is the competitor able to explain the installation to the enduser? Yes = Full marks, No = Zero Marks	3		
6.4	M	Is the installation completed in the allocated time? Yes = Full marks, No = Zero Marks	3		
		Marks awarded	100		

Mark Awarded is the Max Mark minus any specified deductions for difference between Requirement and Result

Signature confirming the accuracy of this printed result

Judge Name	
Judge Signature	

Skill Competition

Summary of Scores

Plumbing & Heating

Competitor Team No

Competitors Name

Plumber :

Assistant :

S.No.	Aspect of Criterion - Description	Maximum Marks	Mark Awarded
1	Subjective - Method of Working	18	
2	Subjective - Plumb Bob & Levels	20	
3	Installation - Fixtures & Fittings	20	
4	Joints Quality	12	
5	Dimension of Fittings	12	
6	Dimension of Water Supply Pipes	18	
	Total	100	

Skill Competition

Final Score - All Teams

Plumbing & Heating

Serial No.	Team Name	Score Judge 1	Score Judge 2	Score Judge 3	Score Judge 4	Score Judge 5	Total
1	A						0
2	B						0
3	C						0
4	D						0
5	E						0
6	F						0

Skill Competition						
Participants Attendance						
Team Name	Plumbers Name	Aadhaar No.	Signature	Assistant Names	Aadhaar No.	Signature
A						
B						
C						
D						
E						
F						
STBY						
STBY						

Skill Competition		
Judges		
S. N.	Judge Names	Judge Identification
1		1
2		2
3		3
4		4
5		5
6		6
7		7

Section - D

D. Infrastructure List

- Workshop Installation-Tools & Equipment positioned by Organizers
- Tool Kit-Tool & Equipment allowed to be brought by competitors for competitions
- In the Competitions all tools and raw material will be supplied by the Organisers

Material: Unit Quantity

Cold Water Supply -Tee uPVC - ½" -Nos 2
Elbow uPVC - ½"-Nos 1
Threaded Brass Elbow uPVC - ½"-Nos 7
Ball Valve uPVC - ½"-Nos 1
Pipe uPVC - ½"-meter 2.60
4-way/Cross Tee uPVC - ½"-Nos 1
Shoe uPVC - ½"-Nos 1
Metal Strap for ½" uPVC Pipe-Nos 12
Screws – 8mm X20 mm long-Nos 24
uPVC Solvent Cement-litres 0.1
uPVC Threaded Plug - ½"-Nos 7
Hot Water Supply-Tee CPVC - ½"-Nos 1
Elbow CPVC - ½"-Nos 4
Threaded Brass Elbow CPVC - ½"-Nos 2
Step-over CPVC - ½"-Nos 2
Pipe CPVC - ½"-meter 1.50
Adapter (male) CPVC - ½"&
Adapter (female) CPVC - ½"
Brass Adapter (male) CPVC - ½"

Clamp for ½" CPVC Pipe-Nos 4

Screws – 8mm X20 mm long-Nos 12

Gun Metal/Brass Ball Valve - ½"-Nos 1

Bend CPVC - ½"-Nos 1

CPVC Solvent Cement-litres 0.1

CPVC Threaded Plug - ½" Nos 2

Elbow Holder CPVC - ½"Nos 2

Sanitary Fixtures

Angular Stop Cock-Nos 4

Bib Cock-Nos 1

Over Head Shower & Arm-Nos 1

Bend Type Mixer Unit-Nos 1

Taflon Tape (Thread Tape)-Nos 5

Rawal Plug For Fixing Screws

Section – E

E. Instructions for candidates

1. Aware of technical description, rules, safety rules & test project
2. Aware of evaluation criteria & competition time table
3. Work station allotment will be by drawing
4. Marking scheme including assessment criteria and all pre-filled objective and subjective marking forms for the test project
5. Before competition starts, competitors shall have prepared their work place and to become familiar with tools & equipment's also raw material and Processes
6. If any thing missing as per infrastructure list, he must inform to expert
7. Before starting the competition, every competitor gets 15 minutes to discussion

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. The shoes worn must be covered at the toe
3. Provision of running water be available near the workstations.
4. 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.
5. 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.