Model Curriculum

12. Senior Manual Metal Arc Welding/Shielded Metal Arc Welding

SECTOR: CAPITAL GOODS

SUB-SECTOR: MACHINE TOOLS, DIES, MOULDS AND PRESS TOOLS, PLASTICS MANUFACTURING MACHINERY, TEXTILE MANUFACTURING MACHINERY, PROCESS PLANT MACHINERY, ELECTRICAL AND POWER MACHINERY, LIGHT ENGINEERING GOODS

OCCUPATION: WELDING AND CUTTING

REF ID: CSC/Q0208, V1.0

NSQF LEVEL: 4

Skill India
कौशल भारत-कुशल भारत

CGSC
CAPITAL GOODS SKILL COUNCIL

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CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

CAPITAL GOODS SKILL COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **' Senior Manual Metal Arc Welding/Shielded Metal Arc Welding '**
QP No. **'CSC/ Q0208, NSQF Level 4'**

Date of Issuance: April 10th, 2014
Valid up to : August 30th, 2016
*Valid up to the next review date of the Qualification Pack or the 'Valid up to' date mentioned above (whichever is earlier)

Authorised Signatory
Tourism & Hospitality Skill Council

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Senior Manual Metal Arc Welding/Shielded Metal Arc Welding

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Senior Manual Metal Arc Welding/Shielded Metal Arc Welding", in the "Capital Goods" Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	**Senior MMAW/SMAW**		
Qualification Pack Name & Reference ID. ID	CSC/Q0208, v1.0		
Version No.	1.0	**Version Update Date**	
Pre-requisites to Training	10th Standard passed, preferably		
Training Outcomes	**After completing this programme, participants will be able to:** • **Manually weld using MMAW/SMAW:** perform manual metal arc welding (MMAW) welding also known as Shielded Metal Arc Welding (SMAW) for a range of standard welding job requirements, weld different materials (carbon steel, low alloy steel and austenitic stainless steel) in 1G/1F, 2G/2F, 3G/3F, 4G/4F,5G/5F and 6G positions. • **Manually cut metal using plasma arc:** manual cutting operations using plasma arc cutting process and check quality parameters. • **Manually cut metals using oxy-**fuel gas: manual cutting operations using oxy fuel process and check quality parameters. • **Basic health and safety practices at the workplace:** identify risks and hazards at workplace, use of PPE, and apply good housekeeping practices, etc., • **Work effectively with others:** effectively communicate with others and demonstrate good ethical practices and discipline.		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of "Senior Manual Metal Arc Welding/Shielded Metal Arc Welding" Qualification Pack issued by "Capital Goods Skill Council".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	**Manually Weld Carbon steels/Low alloy steels using Metal Arc Welding /Shielded Metal Arc Welding** **Theory Duration** (hh:mm) 60:00 **Practical Duration** (hh:mm) 140:00 **Corresponding NOS Code** CSC/N0208	• Explain various welding techniques • Identify various types of base metal such as mild or low carbon steel, stainless steel etc. • State applications Manual arc welding / Shield metal arc welding • Follow safety precautions while performing MMAW or SMAW • Identify Personal Protective equipment used in MMAW/SMAW • Identify and state the function of MMAW welding equipment –transformer, rectifier, generators, and invertors • List consumables required in MMAW /SMAW welding • Classify electrodes based on the covering • Identify welding accessories like holders, cables etc. • Name ancillary equipment required for Manual Metal Arc Welding • Interpret welding symbols • Differentiate between fillet and groove • Identify various types of joints-lap, tee, corner, butt, square, single vee and double vee) • Name various welding positions – flat, horizontal, vertical and overhead - welding positions (ISO 6947 – PA, PB, PC, PD, PE, PF, PG; ASME IX – I-6 G/1-6 F) • Interpret common welder testing codes - ASME section IX, EN 287, ISO 9606, IS 731 • Read and interpret Welding Procedure Specifications (WPS) and Standard Operating Procedures • Explain critical parameters required to produce joints of desired quality – electrode angle, arc length, thickness of base metal and travel speed • Explain applications of various welding techniques – push, perpendicular and drag • Identify various types of beads • Interpret bead characteristics • Explain impact of polarity • Select right sized electrode based on the metal thickness and base metal composition • Check the condition of welding leads,	Training Kit (PowerPoint, Trainer Guide) Arc Welding Machines(MMAW AC/DC) -Welding machine of minimum 200 Amps Chisel, File set, Try Square, Hacksaw Frame , wire brush, Flat Tongs, Steel Rule, Divider, Tong , Measuring tools, Leather hand Gloves, ear plug, mouth mask, Industry Helmet, Leather Apron, Goggles, Leg Guard, Hand Guard, safety shoes as per batch requirement, Scribers, dot punch, Center Punch , Number Punch, First Aid Kit, Magger , Tester , Binding Tape, electrodes Equipment For Destructive & Non Destructive Tests, Welding Simulator, Magger , Tester , Binding Tape, electrodes

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		earthing arrangements and electrode holder • Connect welding leads, earthing arrangements and electrode holder • Select right kind of welding equipment based on the task • Prepare joints for the welding operation • Set amperage based on the metal thickness and composition • Tack weld joint at appropriate intervals and check the readiness of the equipment before final welding • Strike and maintain a stable arc • Produce fillet and grooved welded joints in various positions - flat (PA) IG/1F, horizontal vertical (PB) 2F, horizontal (PC) 2G,vertical upwards (PF) 3F / 3G, vertical downwards (PG) 3F / 3G, 4G Plate (overhead) Plate to Pipe (Fixed) 5F, pipe welding 5G/5F and 6G • Achieve weld quality equivalent to Level C of ISO 1857 • Carry out visual inspection to identify defects and take corrective actions to avoid recurrence of such defects –lack of continuity, uneven and irregular ripple formation, excessive spatter, burn through, undercut, overlap, inclusions, distortion, porosity, surface cracks, lack of fusion or incomplete fusion, lack of penetration, excessive penetration etc. • Measure dimensional and geometrical accuracy using prescribed/suggested instruments • List Non Destructive Testing (NDT) / Destructive Testing (DT) inspection methods • Carry out DPT tests to assess fine defect open to the surface not detected by visual inspection (VT) • Prepare for destructive tests on weld specimens for fillet, butt and corner • Fill up appropriate technical forms ,activity logs as per the requirement • Follow proper communication protocol • Communicate with people in respectful manner in line with organizational policy • Perform numerical operations, geometry and calculations • Maintain current knowledge of application standards, legislation etc.	

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		• Demonstrate problem solving abilities • Plan, organize and sequence work operations as per the job requirement • Work in a team to achieve better results	
2	**Manually Cut Metals Using Plasma** **Theory Duration** (hh:mm) 55:00 **Practical Duration** (hh:mm) 135:00 **Corresponding NOS Code** CSC/N0207	• Explain safety precautions to be followed in plasma cutting • Identify material types – mild steel, high alloy steel, stainless steel, aluminium and alloys • Identify Personal Protective Equipment used in Plasma arc cutting • Correctly wear Personal Protective Equipment • Explain hazards associated with plasma arc cutting method and take corrective actions to avoid such hazards • Explain the principle of plasma arc cutting • Interpret common terms used in plasma cutting • Read and interpret Welding Procedure Specifications (WPS) and Standard Operating Procedures • Explain working principle of 'Transferred' and 'Non transferred' welding equipment • Identify 'Transferred' and 'Non Transferred' plasma arc equipment • List cutting equipment and types of consumables used in plasma cutting equipment • Explain construction of cutting torch • List types of plasma arc gases and explain their suitability • Identify plasma arc cutting equipment including plasma power source, pilot arc ignition system, torch, portable straight line cutters, profile cutting machines, air filter with regulator, burner electrode, compressor, nozzle, electrode holder, contact tube, front cap, gas supply system with gauges, cooling system, earthing clamp, connecting leads and cables • Identify cutting guides and templates • Identify various types of cutting torches (air plasma, oxygen injected and dual gas) • Explain importance of torch to arc distance in relation to thickness of materials, types of torches and gases • Explain factors that affect nozzle life • Explain gouging and back gouging principles, methods and procedure • Identify purging tools and explain their	Training Kit (PowerPoint, Trainer Guide) Plasma Cutter, Rail ,power cables , water tank etc

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		function • Carryout primary inspection of regulators, hoses and valves • Select correct nozzle based on the metal thickness • Connect nozzle to the torch • Explain ampere range and gas pressure range based on the type of material and material thickness • Carryout marking operation wherever necessary • Explain the importance of correct angle to cut and right speed • Explain cutting techniques – stand-off, circle cutting, profile cutting, edge, stenting holes and piercing technique • Carryout cutting operation - down-hand straight cuts (freehand), making straight cuts (track guided), cutting regular shapes, cutting irregular shapes, making angled cuts, cutting chamfers, making radial cuts, gouging/flushing, bevelled edge –weld preparations, cutting out holes on mild steel, high alloy steel, stainless steel, aluminium and alloys • Produce thermal cuts in various forms of material (plate, rolled section, pipe/tube and solid bars) • Adhere to the stated quality criterion • Identify defects arising out of plasma arc cutting and explain the remedial measures • Measure dimensional and geometrical aspects of the cut material	
3	**Manually Cut Metals Using Oxy-fuel gas** **Theory Duration** (hh:mm) 30:00 **Practical Duration** (hh:mm) 70:00 **Corresponding NOS Code** CSC/N0203	• Explain safety precautions to be followed in oxy-fuel gas cutting • Identify Personal Protective Equipment used in oxy-fuel gas cutting • Correctly wear Personal Protective Equipment • Explain hazards associated with oxy-fuel cutting method and take corrective actions to avoid such hazards • Read and interpret Welding Procedure Specifications (WPS) and Standard Operating Procedures • Explain principle of oxy-fuel gas cutting • Identify various types of gas cutting equipment – hand held oxy-fuel gas cutting equipment, portable track driven cutting equipment, fixed bench gas cutting equipment	Training Kit (PowerPoint, Trainer Guide) Gas Cutting attachments, Stand, Gas Welding Torch , Trolley, Grating Table, Working Table, FLASBACK ARRESTOR, Vice Mounted Tables with bench vices fixed, Gas Cylinders (Two each of Oxygen Gas ,Acytelne Gas), Regulator (Single

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		• List components of oxy-fuel gas setup • Identify Oxygen and Acetylene cylinder based on the colour coding • List accessories that aid in cutting operation – cutting guides, trammels and templates • List marking tools required for gas cutting operation • Differentiate between high and low pressure gas regulators • Differentiate between single stage and two stage gas regulators • Explain the relation between base metal thickness and nozzle type • Explain the importance of pre heating • List types of flames used in gas cutting and explain the application • Explain methods to arrest backfire, flashback and other fires • List purging tools and detail their function • Setup oxy-fuel gas setup • Carryout leak testing at critical points of the system • Apply correct lighting procedure • Produce various types of flames by varying the oxygen supply • Select right kind of flame as per the requirement • List sequence of operations to be performed • Carryout marking on the work piece as per the drawing • Perform various cutting operations to include down-hand straight cuts (freehand), making straight cuts (track guided), cutting regular shapes, cutting irregular shapes, making angled cuts, cutting chamfers, making radial cuts, gouging/flushing, beveled edge – weld preparations, cutting out holes • Produce thermal cuts in various forms of material (metal of 3mm and above) • produce cut profiles for various type of materials and forms – Materials: mild carbon steel, high tensile and special steels, Forms: plate, rolled section, pipe/tubes and sold bars • Identify various cutting defects and take remedial actions • Perform quality checks as per the instruction sheet	stage Acetylene Regulator), DE grinder 30 cm wheel motorized Pedestal type; AG-4 & AG-7 Grinders, Chisel, File set, Try Square, Hacksaw Frame , wire brush, Flat Tongs, Steel Rule, Divider, Tong , Measuring tools, Power Saw, Personal Protective Equipment

Sr. No.	Module	Key Learning Outcomes	Equipment Required
4	**Health and safety** **Theory Duration** (hh:mm) 10:00 **Practical Duration** (hh:mm) 08:00 **Corresponding NOS Code** CSC/N1335	• Explain the importance of personal protective equipment (PPE) required for gas cutting operation • State the causes for accidents • Identify job site hazardous work and state possible causes of risk or accident at the workplace • Explain the importance of '5S' at the workplace	Training kit (Trainer guide, PowerPoint) Leather gloves, leather apron, welding screen – helmet types, hand screen welding and safety shoes
5	**Fire Safety** **Theory Duration** (hh:mm) 05:00 **Practical Duration** (hh:mm) 30:00 **Corresponding NOS Code** CSC/N1335	• Explain types of fires - Class A, B, C and D • Select appropriate fire extinguisher to control fire • Use PASS method to operate a fire extinguisher • Follow fire safety signs and safe evacuation method in case of a fire • Identify the location of assembly point, fire exit, fire alarm • Follow reporting procedure in case of a fire	Training kit (Trainer guide, PowerPoint) Class A, B, C, D and K fire extinguishers
6	**Emergencies, rescue and first aid procedure** **Theory Duration** (hh:mm) 09:00 **Practical Duration** (hh:mm) 18:00 **Corresponding NOS Code** CSC/N1335	• Follow electrical safety procedures • Use approved method to rescue a person from electrocution • State the importance of first aid • Identify the contents of a first aid kit and their application • Administer first aid in case of bleeding, burns, choking, electrical shock, poisoning, etc. • Use of CPR process • Bandage wounds • Explain stages of crisis and crisis management • Prepare an incident report	Training kit (Trainer guide, PowerPoint) First aid kit with all contents
7	**Work effectively with others** **Theory Duration** (hh:mm) 20:00 **Practical Duration**	• Explain the importance of team work and team dynamics • State 4Cs of working in a team • Explain types of communication • Apply effective communication technique • Overcome barriers to effective communication	Training kit (Trainer guide, PowerPoint)

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 60:00 **Corresponding NOS Code** CSC/N1336	• Demonstrate active listening skills • Demonstrate good customer service skills • Explain the importance of ethical behaviour in your day-to-day work • State the importance of discipline in life and apply the same at workplace	
8	**Final Assessment** **Theory Duration** (hh:mm) 04:00 **Practical Duration** (hh:mm) 06:00 **Corresponding NOS Code**	• To test skills and knowledge	
	Total Duration **Theory Duration** **193:00** **Practical Duration** **467:00**	**Unique Equipment Required:** Arc Welding Machines(MMAW AC/DC) -Welding machine of minimum 200 Amps Chisel, File set, Try Square, Hacksaw Frame , wire brush, Flat Tongs, Steel Rule, Divider, Tong , Measuring tools, Leather hand Gloves, ear plug, mouth mask, Industry Helmet, Leather Apron, Goggles, Leg Guard, Hand Guard, safety shoes as per batch requirement, Scribers, dot punch, Center Punch , Number Punch, First Aid Kit, Magger , Tester , Binding Tape, electrodes Equipment For Destructive & Non Destructive Tests, Welding Simulator, Magger , Tester , Binding Tape, electrodes, Gas Cutting attachments, Stand, Gas Welding Torch , Trolley, Grating Table, Working Table, FLASBACK ARRESTOR, Vice Mounted Tables with bench vices fixed, Gas Cylinders (Two each of Oxygen Gas ,Acytelne Gas), Regulator (Single stage Acetylene Regulator), DE grinder 30 cm wheel motorized Pedestal type; AG-4 & AG-7 Grinders, Chisel, File set, Try Square, Hacksaw Frame , wire brush, Flat Tongs, Steel Rule, Divider, Tong , Measuring tools, Power Saw, Personal Protective Equipment, Plasma Cutter	

Grand Total Course Duration: **660 Hours, 0 Minutes**

*(This syllabus/ curriculum has been approved by **Capital Goods Skill Council**)*

Trainer Prerequisites for Job role: "Senior MMAW/SMAW" mapped to Qualification Pack: "CSC/Q0208 v1.0"

Sr. No.	Area	Details
1	**Description**	Perform manual metal arc welding (MMAW) also known as shielded metal arc welding (SMAW) for producing a range of joints on various forms of materials including carbon steels, low alloy steels and austenitic stainless steel in all positions, as per welding specification procedures (WPS)
2	**Personal Attributes**	Basic communication, numerical and computational abilities. Openness to learning, ability to plan and organize own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self and work to improve efficiency and effectiveness.
3	**Minimum Educational Qualifications**	Diploma /Degree in Mechanical Engineering
4a	**Domain Certification**	Certified for Job Role: "Senior MMAW/SMAW" mapped to QP: "CSC/Q0208, v1.0". Minimum accepted score is 80%
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "SSC/Q1402". Minimum accepted 70 % as per respective SSC guidelines is 70%.
5	**Experience**	• 3-4 years of industry experience in the relevant field • 3-4 years of teaching experience

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Senior MMAW/SMAW
Qualification Pack	CSC/Q0208, v1.0
Sector Skill Council	Capital Goods Skill Council

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre(as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training canter based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 60% in aggregate and 40% in each NOS
6	The marks are allocated PC wise; however, every NOS will carry a weight age in the total marks allocated to the specific QP

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
1.CSC/N0208 Manually weld carbon steel/ low alloy steel and austenitic stainless steel using Metal Arc Welding /Shielded Metal Arc Welding	PC1.work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	100	3	1	2
	PC2.adhere to procedures or systems in place for health and safety, personal protective equipment (PPE) and other relevant safety regulations		4	1	3
	PC3.check the condition of, and correctly connect, welding leads, earthing arrangements and electrode holder		2	0	2
	PC4.deal with any faults or differential as per laid procedures		2	0	2
	PC5.follow fume extraction safety procedures		3	1	2
	PC6.read and interpret routine information on written job instructions, welding procedure specifications (WPS) and standard operating procedures		3	1	2
	PC7.select welding machines		2	0	2
	PC8.re-dry electrodes as per electrode classification requirement		3	1	2
	PC9.prepare the work area for the welding activities		3	1	2
	PC10.perform measurements for joint preparation and routine MMAW		2	0	2
	PC11.prepare the various forms of materials and the joint in readiness for welding		3	0	3
	PC12.tack weld the joint at appropriate intervals, and check the joint for accuracy before final welding		2	0	2
	PC13.use manual metal-arc welding and related equipment		3	0	3
	PC14.connect equipment to power source		3	0	3
	PC15.connect cables, electrode holders, return leads and ground clamps to appropriate terminal		2	0	2
	PC16.set, read and adjust amperage controls		3	1	2
	PC17.verify setup by running test and appropriately handle weld specimen/scrap plate		3	1	2
	PC18.tack weld the joint at appropriate intervals, and check the joint for accuracy before final welding		3	0	3
	PC19.strike and maintain a stable arc		2	0	2
	PC20.stop and properly re-start arc to avoid welding defects		2	0	2
	PC21.manipulate electrode angle using various methods as per WPS		3	1	2
	PC22.maintain constant puddle by using appropriate travel speed		2	0	2
	PC23.remove slag in an appropriate manner (eg. wire brush, hammer, etc.)		2	0	2
	PC24.weld the joint to the specified quality,		5	1	4

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	dimensions and profile applicable to range of material				
	PC25.produce range of welded joints to within the mentioned standard using single or multi-run welds		5	1	4
	PC26.produce joints of the required quality and of specified dimensional accuracy		4	1	3
	PC27.produce range of welded joints in various positions as per the WPS specified		3	0	3
	PC28.shut down and make safe the welding equipment on completion of the welding activities		2	0	2
	PC29.identify various weld defects		4	1	3
	PC30.check that the welded joint conforms to the specification, by checking various		4	1	3
	PC31.detect surface imperfections and deal with them appropriately		2	0	2
	PC32.carry out DPT tests to assess fine defect open to the surface not detected by visual inspection (VT)		3	1	2
	PC33.assist in preparation for non-destructive testing of the welds		3	1	2
	PC34.prepare for destructive tests on weld specimens for fillet, butt and corner		2	0	2
	PC35.deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	0	3
	Total		**100**	**16**	**84**
2.CSC/N0207 Manually cut metal materials using plasma arc	PC1.work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	**100**	3	1	2
	PC2.take necessary safety precautions for plasma cutting operations including equipment, processes and checks		2	0	2
	PC3.interpret cutting procedure data sheets specifications		3	1	2
	PC4.check regulators, hoses and check that valves are securely connected and free from leaks and damage		2	0	2
	PC5.check equipment is calibrated and approved for use		2	0	2
	PC6.check/fit the correct nozzle to the torch		2	0	2
	PC7.match correct tips and cups to the torch as per requirement and manufacturer's equipment instructions		3	1	2
	PC8.set the amperage and gas pressure as per metal thickness, metal type, and type of gas		2	0	2
	PC9.use the correct procedure for lighting, adjusting and extinguishing the arc		4	1	3
	PC10.use appropriate and safe procedures for handling and storing of gas cylinders		3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC11.prepare the work area for the cutting activities		2	0	2
	PC12.obtain the appropriate tools and equipment for the plasma arc cutting operations, and check that they are in a safe and usable condition		2	0	2
	PC13.check that the plasma arc cutting equipment is correctly set up for the operations to be performed		2	0	2
	PC14.carry out correct measurements required using appropriate equipment and methods for planning the cut		3	1	2
	PC15.where appropriate, mark out the components for the required operations, using appropriate tools and techniques		4	1	3
	PC16.perform trial cut to check for cut defect		2	0	2
	PC17.operate the plasma cutting equipment to produce items/cut shapes to the dimensions and profiles as specified		5	1	4
	PC18.use the correct angles to cut and the right speed		3	0	3
	PC19.use various types of plasma arc cutting methods/techniques		4	0	4
	PC20.perform various cutting operations correctly		4	0	4
	PC21.produce thermal cuts in various forms of material		4	0	4
	PC22.produce cut profiles for various type of materials		4	0	4
	PC23.produce thermally-cut components which meet specified quality criteria		5	1	4
	PC24.detect and correct defects in cut		3	0	3
	PC25.leave the work area in a safe and tidy condition on completion of the cutting activities		2	0	2
	PC26.check that the finished components meet the required standard		4	1	3
	PC27.use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the cut material are to the specification		6	2	4
	PC28.identify various cutting defects		3	0	3
	PC29.report any difficulties or problems that may arise with the cutting activities, and carry out any agreed actions		2	0	2
	PC30.detect equipment malfunctions and deal with them appropriately		2	0	2
	PC31.deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		3	0	3
	PC32.shut down and make safe the cutting equipment on completion of the cutting activities or during an emergency		2	0	2

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC33.follow standard emergency procedures in case of emergencies		3	1	2
	Total		**100**	**13**	**87**
3.CSC/N0203 Manually cut metal and metal alloys using oxy fuel gas	PC1.work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines	**100**	3	1	2
	PC2.take necessary safety precautions for gas cutting operations including equipment, processes and checks		2	0	2
	PC3.interpret cutting procedure data sheets specifications		3	1	2
	PC4.check regulators, hoses and check that valves are securely connected and free from leaks and damage		2	0	2
	PC5.check equipment is calibrated and approved for use		2	0	2
	PC6.check/fit the correct size gas nozzle to the torch		2	0	2
	PC7.ensure preheat and oxygen holes on the tips are clean		2	0	2
	PC8.check that a flashback arrestor is fitted		2	0	2
	PC9.set appropriate gas pressures		2	0	2
	PC10.use the correct procedure for lighting, adjusting and extinguishing the flame		3	1	2
	PC11.adjust torch valve for type of flame such as neutral, carburizing and oxidizing		2	0	2
	PC12.follow sequence of operations such as pre-heating material and initiating cut		3	1	2
	PC13.mark out the locations for cutting accurately and as per requirement		3	1	2
	PC14.use appropriate and safe procedures for handling and storing of gas cylinders		3	1	2
	PC15.prepare the work area for the cutting activities		2	0	2
	PC16.obtain the appropriate tools and equipment for the oxy-fuel gas cutting operations, and check that they are in a safe and usable condition		2	0	2
	PC17.check that the oxy-fuel gas cutting equipment is set up for the operations to be performed		2	0	2
	PC18.adjust cylinder valves and adjust regulator for operating pressure to achieve specifications for required operations		3	1	2
	PC19.where appropriate, mark out the components for the required operations, using appropriate tools and techniques		2	0	2
	PC20.perform trial cut to check for cut defects		3	0	3
	PC21.operate the oxy-fuel gas cutting equipment to produce items/cut shapes to the dimensions and profiles specified		5	1	4
	PC22.use various types of oxy-fuel gas cutting methods		4	0	4

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	PC23.perform various cutting operations correctly		4	0	4
	PC24.produce thermal cuts in various forms of material (metal of 3mm and above)		4	0	4
	PC25.produce cut profiles for various type of materials and forms		3	0	3
	PC26.produce thermally-cut components which meet specified quality criteria		4	1	3
	PC27.recognize and correct burn back and flashback		3	1	2
	PC28.detect and correct defects in cut		2	0	2
	PC29.ensure the work area is left in a safe and tidy condition on completion of the cutting activities		2	0	2
	PC30.check that the finished components meet the standard required		3	1	2
	PC31.use appropriate methods and equipment to check the quality, and that all dimensional and geometrical aspects of the cut material are to the specification		4	1	3
	PC32.identify various cutting defects and follow organisation recommended procedures to address them		3	1	2
	PC33.report any difficulties or problems that may arise with the cutting activities, and carry out any agreed actions		2	0	2
	PC34.detect equipment malfunctions and deal with them appropriately		2	0	2
	PC35.deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve		2	0	2
	PC36.shut down and make safe the cutting equipment on completion of the cutting activities		2	0	2
	PC37. follow standard emergency procedures in case of emergencies		3	1	2
	Total		**100**	**14**	**86**
4.CSC/N1335 Use basic health and safety practices at the workplace	PC1.use protective clothing/equipment for specific tasks and work conditions	**100**	5	2	3
	PC2.state the name and location of people responsible for health and safety in the workplace		3	1	2
	PC3.state the names and location of documents that refer to health and safety in the workplace		3	1	2
	PC4.identify job-site hazardous work and state possible causes of risk or accident in the workplace		5	2	3
	PC5.carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods		4	2	2

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	of accident prevention in the work environment of the job role				
	PC6.state location of general health and safety equipment in the workplace		3	2	1
	PC7.inspect for faults, set up and safely use steps and ladders in general use		5	2	3
	PC8.work safely in and around trenches, elevated places and confined areas		5	2	3
	PC9.lift heavy objects safely using correct procedures		5	2	3
	PC10.apply good housekeeping practices at all times		4	2	2
	PC11.identify common hazard signs displayed in various areas		5	2	3
	PC12.retrieve and/or point out documents that refer to health and safety in the workplace		3	1	2
	PC13.use the various appropriate fire extinguishers on different types of fires correctly		4	1	3
	PC14.demonstrate rescue techniques applied during fire hazard		4	1	3
	PC15.demonstrate good housekeeping in order to prevent fire hazards		3	1	2
	PC16.demonstrate the correct use of a fire extinguisher		4	1	3
	PC17.demonstrate how to free a person from electrocution		4	1	3
	PC18.administer appropriate first aid to victims where required eg. in case of bleeding, burns, choking, electric shock, poisoning etc.		4	1	3
	PC19.demonstrate basic techniques of bandaging		3	1	2
	PC20.respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		4	1	3
	PC21.perform and organize loss minimization or rescue activity during an accident in real or simulated environments		3	1	2
	PC22.administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or		3	1	2

Assessable Outcome	Assessment Criteria	Total Mark (500)	Out Of	Marks Allocation	
				Theory	Skills Practical
	simulated cases				
	PC23.demonstrate the artificial respiration and the CPR Process		3	1	2
	PC24.participate in emergency procedures		3	2	1
	PC25.complete a written accident/incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26.demonstrate correct method to move injured people and others during an emergency		4	1	3
	Total		**100**	**36**	**64**
5.CSC/N1336 Work effectively with others	PC1.acurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	**100**	10	3	7
	PC2.accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	3	7
	PC3.give information to others clearly, at a pace and in a manner that helps them to understand		10	3	7
	PC4.display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	3	7
	PC5.consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	3	7
	PC6.display appropriate communication etiquette while working		10	3	7
	PC7.display active listening skills while interacting with others at work		10	3	7
	PC8.use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	3	7
	PC9.demonstrate responsible and disciplined behaviors at the workplace		10	3	7
	PC10.escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict		10	3	7
	Total		**100**	**30**	**70**
	Grand Total	**500**	**500**	**109**	**391**
	Percentage Weightage:			**22**	**78**
	Minimum Pass% to qualify (aggregate):			**60**	