Indian Iron & Steel Sector Skill Council

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR IRON & STEEL INDUSTRY

Contents

What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

Introduction

Qualifications Pack – Iron & Steel – Fitter: Electronic Assembly

SECTOR: Iron & Steel

SUB-SECTOR: Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory

REFERENCE ID: ISC/Q1101

ALIGNED TO: NCO-2004/NIL

Title of Job : This job is all about assembling and wiring up electronic equipment and systems to mechanical equipment. It involves the assembly of the electronic products, inclusive of components, sub-assemblies, or completed equipment/systems. Along with soldering techniques and anti-static protection techniques assemble with the mechanical equipment.

Personal Attributes: The candidate should possess 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.

Qualifications Pack Code	ISC/Q1101		
Job Role	Iron & Steel – Fitter: Electronic Assembly		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron & Steel	Drafted on	21/07/2014
Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Electronics & Instrumentation Maintenance	Next review date	30/12/2015
NSQC Clearance on	18/06/2015		

Job Details

Job Role	Iron & Steel – Fitter: Electronic Assembly
Role Description	Operations to assemble and wire up electronic panels/components and equipments and systems to mechanical equipment.
NSQF level	3
Minimum Educational Qualifications	Diploma(10+) -Electrical or Electronic
Maximum Educational Qualifications	Diploma - Electronics
Training (Suggested but not mandatory)	• Theoretical concepts on electronic panels and equipment handling • Trainings on operation of electronic panels/components and equipments
Minimum Job Entry Age	18 years
Experience	In lieu of minimum qualification the incumbent should have minimum 12 months of relevant experience in the similar field/function.
Occupational Standards (OS)	Compulsory: ISC/N1101: Assemble and wire up electronic equipment and systems to mechanical equipment ISC/N0008: Use basic health and safety practices at the workplace ISC/N0009: Works effectively with others Optional: N/A
Performance Criteria	As described in the relevant NOS units

Definitions

Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context.
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.

Sub-Sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.

Keywords /Terms	Description
NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
OEM	Original Equipment Manufacturer
OS	Occupational Standard(s)
QP	Qualifications Pack
5 S	Technique of maintaining orderliness –Japanese terminology
CP	Control Plan
WI	Work Instructions

ISC/N1101: Assemble and wire up electronic equipment and systems to mechanical equipment

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National Occupational Standards

Overview

This unit covers operations to assemble and wire up electronic equipment and systems to mechanical equipment

National Occupational Standard

Unit Code	ISC/N1101
Unit Title (Task)	Assemble and wire up electronic equipment and systems to mechanical equipment
Description	This unit covers the skills and knowledge needed to assemble and wire up electronic products, inclusive of components, sub-assemblies, or completed equipment/systems to mechanical equipment, in accordance with approved procedures. The candidate's responsibilities will require them to comply with organizational policy and procedures for the electronic assembly and wiring activities undertaken, and to report any related problems that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work with a minimum of supervision, taking full responsibility for their own actions and for the quality and accuracy of the work that they carry out. .
Scope	This unit/task covers the following: • Working safely all the time • Assembling and wiring up electronic equipment and systems to mechanical equipment

Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Working safely all the time	The user/individual on the job should be able to: PC1. Adhere to procedures or systems in place for safety, including personal protective equipment (PPE), other relevant health and safety regulations and guidelines PC2. Ensure that the components are free from damage, foreign objects, dirt or other contamination PC3. Check that tools and equipment to be used are in a safe, tested, calibrated and usable condition PC4. Where appropriate, apply procedures and precautions to eliminate electrostatic discharge (ESD) hazards (e.g. the use of grounded wrist straps and mats)
Assembling and wiring up electronic equipment and systems to mechanical equipment	The user/individual on the job should be able to: PC5. Follow the relevant instructions, assembly drawings and any other specifications. Documents during the assembly activities: • Assembly drawings and charts • Interconnection net diagrams • Schedules of specified components • Wiring specifications • Wire running lists PC6. Ensure that the specified components are available and that they are in a usable condition. Prepare components and complete the preparatory assembly:

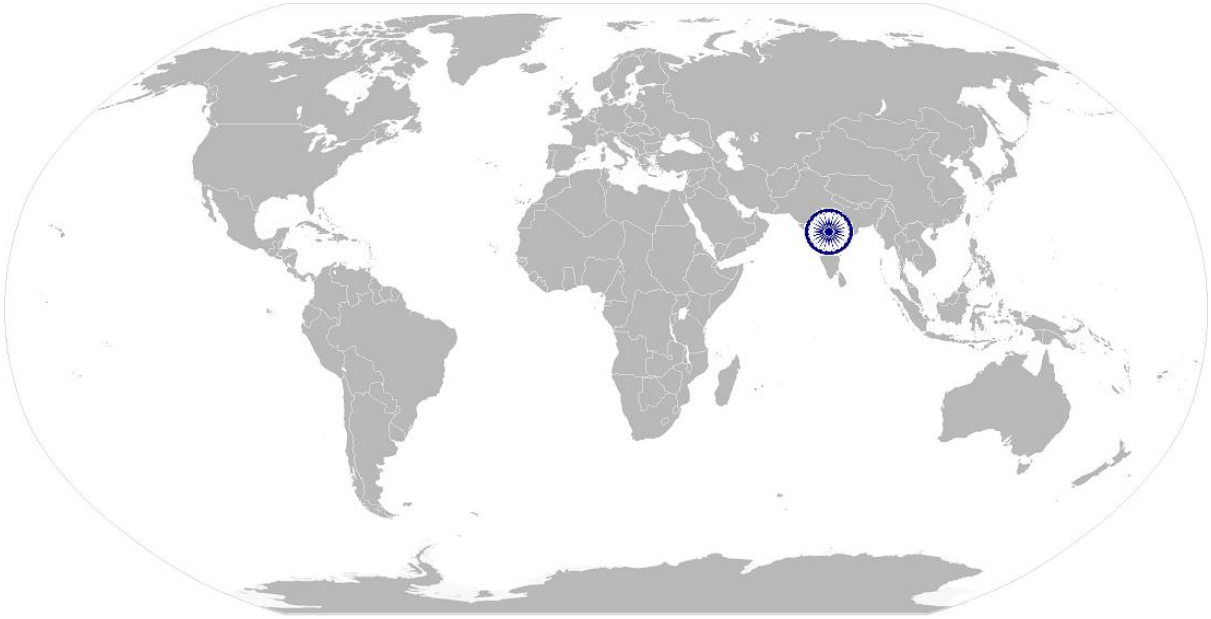
	• Use hand tools/automated tools for securing all fastenings • Assemble sub-units to support housings/brackets • Assemble connectors and allied devices PC7. Obtain, check and prepare consumables and specialized tools to be used for the wiring and interconnections. Check and prepare consumables and tools: • Older and any associated fluxes (e.g. Sufficient quantity, right type, good condition) • Wire strippers and cutters (e.g. Right size, good condition) • Authorized crimp tooling and attachments (e.g. Checked for sizes, calibration and condition) • Cables and individual wiring/fibre optic links (e.g. Correct sizes and types, good condition) • Cable strapping obtained and cut to nominal length (e.g. Right sizes and sufficient quantities) PC8. Use the appropriate methods and techniques to assemble the components in their correct positions. Methods and techniques: • Set up, programme and use automated wiring termination equipment (where appropriate) • Attach wire terminations by appropriate method/s (e.g. Soldering, crimping) • Set out/position interconnection wiring • Bundle/strap/tie wiring looms and cables • Cut wires to required length • Set out and terminate any fibre optic links • Strip insulation from ends of wires assemble electronic equipment or systems, in compliance with one or more of the following: o National and international wiring regulations o National and international standards and procedures o Company standards and procedures PC9. Secure the components using the specified connectors and securing devices PC10. Obtain, check and prepare components, and complete the preparatory assembly PC11. Check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification. Preliminary checks on the completed work for the following: • Security of all assembled and interconnected items • Insulation resistance between housing assembly and interconnection wiring • Continuity of all interconnections • Unwanted short circuits between wires PC12. Select the appropriate software PC13. Load appropriate software on electronic components in accordance with laid down procedures PC14. Check the output of software as per procedure PC15. Check the functionality of the completed electronic assembly PC16. Leave the work area in a safe and tidy condition on completion of the electrical equipment assembly activities use the correct issue of drawings, job instructions and specifications PC17. Follow risk assessment procedures and regulations PC18. Follow clean work area protocols

	PC19. Carry out the assembling and wiring activities in line with organizational procedures PC20. Create and store records of the activities, in accordance with appropriate procedures
Element	Knowledge and Understanding (K)
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. Relevant standards, policies, and procedures followed in the company KA2. Relevant health and safety requirements of the work KA3. The organizational process or procedure for assembly and wiring KA4. Responsibilities with regard to the reporting lines and procedures in the working area KA5. Appropriate people and their responsibilities within the candidate's working area KA6. To whom they should report if they have problems that they cannot resolve KA7. The importance of leaving the work area in a safe and clean condition on completion of the electronic assembly and wiring activities (e.g. returning tools and equipment to the designated location, cleaning the work area, removing and disposing of waste)
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. The specific safety precautions to be taken when working with soldering and crimping equipment/tools and wiring aids within an electronics assembly and wiring environment (e.g. avoiding hot solder splashes and flying ends from cut wires) KB2. The personal protective equipment (PPE) to be worn whilst carrying out the electronic wiring activities concerned, for both personal protection and protection of the components and circuits (e.g. protective outer clothing, eye and hearing protection, anti-static devices) KB3. Regulations and standards that are relevant to electronic wiring and assembly being undertaken KB4. How mechanical assembly instructions are represented and how to interpret them KB5. The general principles of wiring and assembly, the range of methods used, and key features of each (e.g. tin/lead soldering, lead-free soldering systems, no-wash fluxing, crimping) KB6. how the different types of electronic wiring and insulation are coded and specified KB7. How information on wiring interconnections is specified, with particular reference to the role of wiring schedules, wire-running lists, backplane net interconnect lists KB8. The various methods used for securing electronic wiring (e.g. heat shrink sleeves, strapping, cable ties, p-clips) KB9. The care and selection of tools and aids used in wiring and assembly work (e.g. soldering tools and equipment, crimp tools, testing and checking equipment for continuity, short circuit testing, joint/crimp `pull-off' security, insulation resistance) KB10. How to recognize wiring types and sizes, their identification, coding and range

	of termination methods KB11. How to identify the types and read the values of electronic components (e.g. resistors, capacitors, diodes, integrated circuits) with particular reference to their polarity, orientation, colour coding, value, tolerance, working voltage/current KB12. How to take anti-static precautions in relation to component handling during the wiring and assembly of electronic products, and when such precautions are needed KB13. The handling requirements and termination methods used for fibre-optic links KB14. The range of checks and tests used within wiring and assembly work (e.g. insulation resistance, flashover testing, continuity, short circuit testing) KB15. Calibration requirements for tools and equipment used in wiring (e.g. crimp tool test and selection for wire sizes, `pull-off' limits, meters for continuity and insulation resistance checks) KB16. Importance of and maintain dust free environment for electronic assembly KB17. Handling multi-layered populated PCB's KB18. The documentation completion requirements for the work undertaken KB19. The problems that can occur with wiring and assembly work, and how they can be avoided KB20. Basic units used in electronic technology KB21. Function of electrical components KB22. Application of electrical components KB23. Current and voltage distribution in series and parallel circuits KB24. Magnetic fields for bar magnets in various configurations KB25. Polarity of a solenoid KB26. Construction of a typical capacitor KB27. Sine wave as displayed on an oscilloscope KB28. Determining input and output voltage of double wound transformers KB29. How to construct a simple bridge rectifier circuit and its function
Skills (S) w.r.t. the scope	
Element	**Skills**
A. Core Skills/ Generic Skills	Communication
	The user/ individual on the job needs to know and understand how to: SA1. Read and interpret information correctly from various job specification documents, manuals, health and safety instructions, memos, etc. applicable to the job in English and/or local language SA2. Fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language SA3. Convey and share technical information clearly using appropriate language SA4. Check and clarify task-related information SA5. Liaise with appropriate authorities using correct protocol SA6. Communicate with people in respectful form and manner in line with organizational protocol
	Numerical and computational skills
	The user/individual on the job needs to know and understand how to:

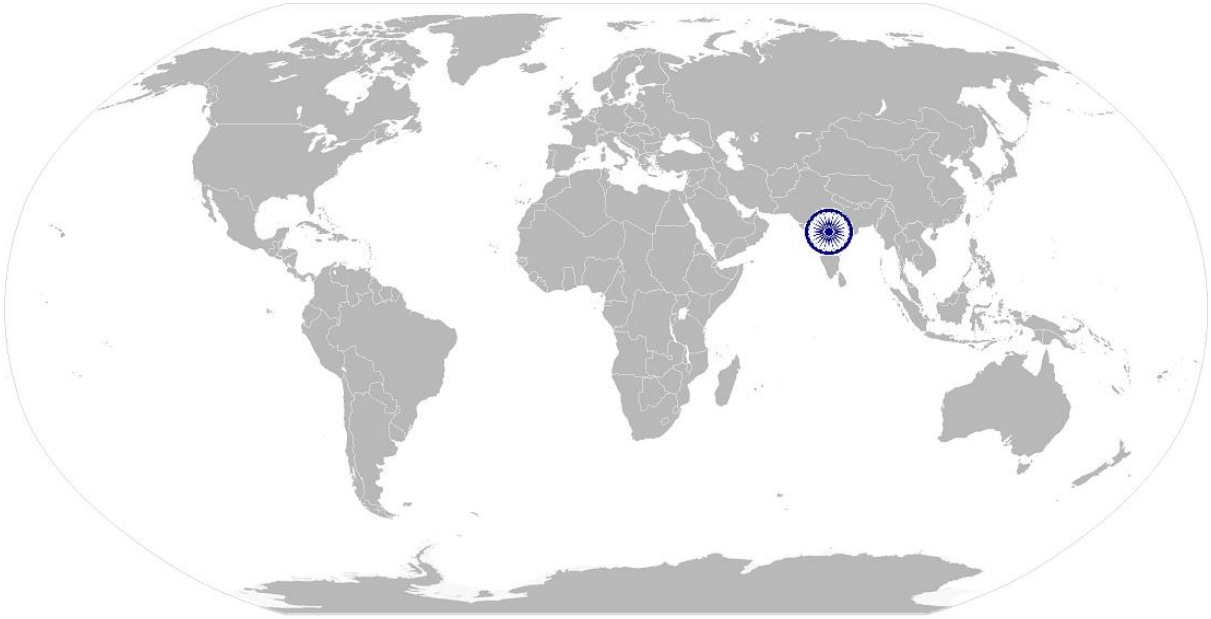
	SA7. Undertake numerical operations, and calculations/ formulae SA8. Identify and draw various basic, compound and solid shapes as per dimensions given SA9. Use appropriate measuring techniques and units of measurement SA10. Use appropriate units and number systems to express degree of accuracy SA11. Use basic geometrical calculations (area, perimeter, radii, etc.) for plane figures SA12. Use basic algebra to solve linear equations SA13. Use basic calculations with positive, negative and fractional indices SA14. Use appropriate measuring techniques
B. Professional Skills	Problem Solving
	The user/individual on the job needs to know and understand how to: SB1. Identify problems with work planning, procedures, output and behaviour and their implications SB2. Prioritize and plan for problem solving SB3. Communicate problems appropriately to others SB4. Identify sources of information and support for problem solving SB5. Seek assistance and support from other sources to solve problems SB6. Identify effective resolution techniques SB7. Select and apply resolution techniques SB8. Seek evidence for problem resolution
	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB9. Plan, prioritize and sequence work operations as per job requirements SB10. Organize and analyze information relevant to work SB11. Basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
	Self-Management
	The user/individual on the job needs to know and understand: SB12. Importance of taking responsibility for own work outcomes SB13. Importance of adherence to work timings, dress code and other organizational policies SB14. Importance of following laid down rules, procedures, instructions and policies SB15. Importance of exercising restraint while expressing dissent and during conflict situations SB16. How to avoid and manage distractions to be disciplined at work SB17. Importance of time management for achieving better results
	Teamwork

	The user/individual on the job needs to know and understand how to: SB18. Work in a team in order to achieve better results SB19. Identify and clarify work roles within a team SB20. Communicate and cooperate with others in the team SB21. Seek assistance from fellow team members

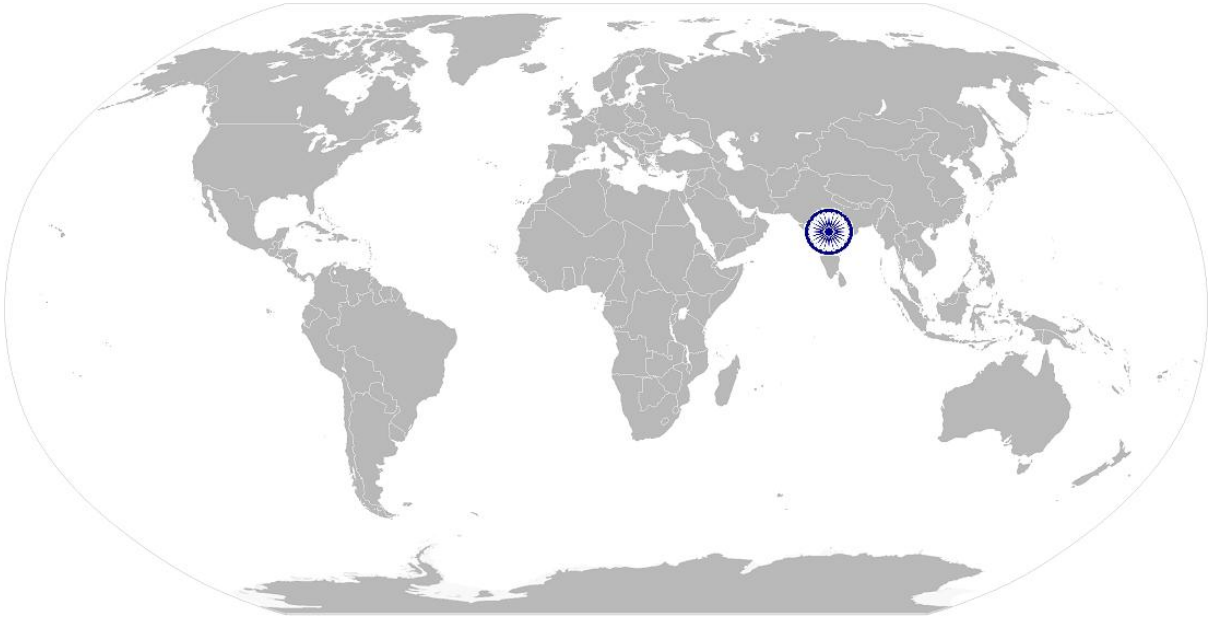


NOS Version Control

NOS Code	ISC/N1101		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	Steel, Sponge Iron, Ferro Alloys, Re-Rollers, Refractory	Last reviewed on	30/12/2014
Occupation	Electronics & Instrumentation Maintenance	Next review date	30/12/2015



National Occupational Standards



Overview

This unit covers health, safety and security at the workplace. This includes procedures and practices that candidates need to follow to help maintain a healthy, safe and secure work environment.

National Occupational Standard

Unit Code	ISC/N0008
Unit Title (Task)	Use basic health and safety practices at the workplace
Description	This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace. It covers responsibilities towards self, others, assets and the environment. It includes understanding of risks and hazards in the workplace, along with common techniques to minimize risk, deal with accidents, emergencies, etc.
Scope	This unit/task covers the following: • Health and safety procedures • Fire safety procedures • Emergencies, rescue and first aid procedures

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Health and safety procedures	The user/individual on the job should be able to: PC1. Use protective clothing/equipment for specific tasks and work conditions Protective clothing includes: • Leather or asbestos gloves • Flame proof aprons • Flame proof overalls buttoned to neck • Cuff less (without folds) trousers • Reinforced footwear • Helmets/hard hats • Cap and shoulder covers • Ear defenders/plugs • Safety boots • Knee pads • Particle masks • Glasses/gloves/visors Equipment includes: • Hand shields • Machine guards • Residual current devices • Shields • Dust sheets • Respirator PC2. State the name and location of people responsible for health and safety in the workplace

	Various areas are listed below: • • Equipment • Packages • Inside buildings • Open areas and public spaces, etc. PC3. State the names and location of documents that refer to health and safety in the workplace PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace Hazards include: • Working with electrical and thermal tools and equipment • Sharp edged and heavy tools • Heated metals • Oxyfuel and gas cylinders • Welding radiation • Surfaces: sharp, slippery, uneven, chipped, broken, etc. • Substances: chemicals, gas, oxy-fuel, fumes, dust, etc. • Physical: working at heights, large and heavy objects and machines, sharp and piercing objects, tolls and machines, intense light, load noise, obstructions in corridors, by doors, blind turns, noise, over stacked shelves and packages, etc. • Electrical: power supply and points, loose and naked cables and wires, electrical machines and appliances, etc. PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role Safe working practices include: • Using protective clothing and equipment • Putting up and reading safety signs • Handle tools in the correct manner and store and maintain them properly • Keep work area clear of clutter, spillage and unsafe object lying casually • While working with electricity take all electrical precautions like insulated clothing, adequate equipment insulation, use of control equipment, dry work area, switch off the power supply when not required, etc. • Safe lifting and carrying practices • Use equipment that is working properly and is well maintained • Take due measures for safety while working in confined places, trenches or at heights, etc. Including safety harness, fall arrestors, etc. Methods are: • Training in health and safety procedures • Using health and safety procedures • Use of equipment and working practices (such as safe carrying procedures) • Safety notices, advice • Instruction from colleagues and supervisors

	PC6. State location of general health and safety equipment in the workplace PC7. Inspect for faults, set up and safely use steps and ladders in general use Faults : • Corrosion of metal components • Deterioration • Splits and cracks timber components • Imbalance • Loose rungs • Nuts or bolts, etc. Set up: • Firm/level base • Clip/lash down • Leaning at the correct angle, etc. PC8. Work safely in and around trenches, elevated places and confined areas PC9. Lift heavy objects safely using correct procedures PC10. Apply good housekeeping practices at all times. Good housekeeping practices: • Clean/tidy work areas • Removal/disposal of waste products • Protect surfaces PC11. Identify common hazard signs displayed in various areas PC12. Retrieve and/or point out documents that refer to health and safety in the workplace
Fire safety procedures	The user/individual on the job should be able to: PC13. Use the various appropriate fire extinguishers on different types of fires correctly. Fire extinguishers: • Sand • Water • Foam • Co2 • Dry powder Fires: • Class A: Ordinary solid combustibles, e.g. wood, paper, cloth, plastic, charcoal etc. • Class B: Flammable liquids and gases, e.g. gasoline, propane, diesel fuel, tar, cooking oil and similar substances • Class C: Electrical equipment e.g. appliances, wiring, breaker panels etc. (these categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no longer receiving electricity) • Class D: Combustible metals such as magnesium, titanium, and sodium (these fires burn at extremely high temperatures and require special suppression agents) Causes of fires: • Heating of metal

	• Spontaneous ignition • Sparking, • Electrical heating • Loose fires (e.g. Smoking, welding, etc.) • Chemical fires, etc. PC14. Demonstrate rescue techniques applied during fire hazard PC15. Demonstrate good housekeeping in order to prevent fire hazards PC16. Demonstrate the correct use of a fire extinguisher
Emergencies, rescue and first-aid procedures	The user/individual on the job should be able to: PC17. Demonstrate how to free a person from electrocution PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc. PC19. Demonstrate basic techniques of bandaging PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments. few General health and safety equipment are mentioned below : • Fire extinguishers • First aid equipment • Safety instruments and clothing • Safety installations, e.g. Fire exits, exhaust fans etc. PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments 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 simulated cases PC23. Demonstrate the artificial respiration and the CPR Process PC24. Participate in emergency procedures. Emergency procedures are: • Raising alarm • Safe/efficient evacuation • Correct means of escape • Correct assembly point • Roll call • Correct return to work PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible Incident Report should capture: • Name • Date/time of incident • Date/time of report, • Location • Environment conditions • Persons involved • Sequence of events • Injuries sustained • Damage sustained • Actions taken • Witnesses

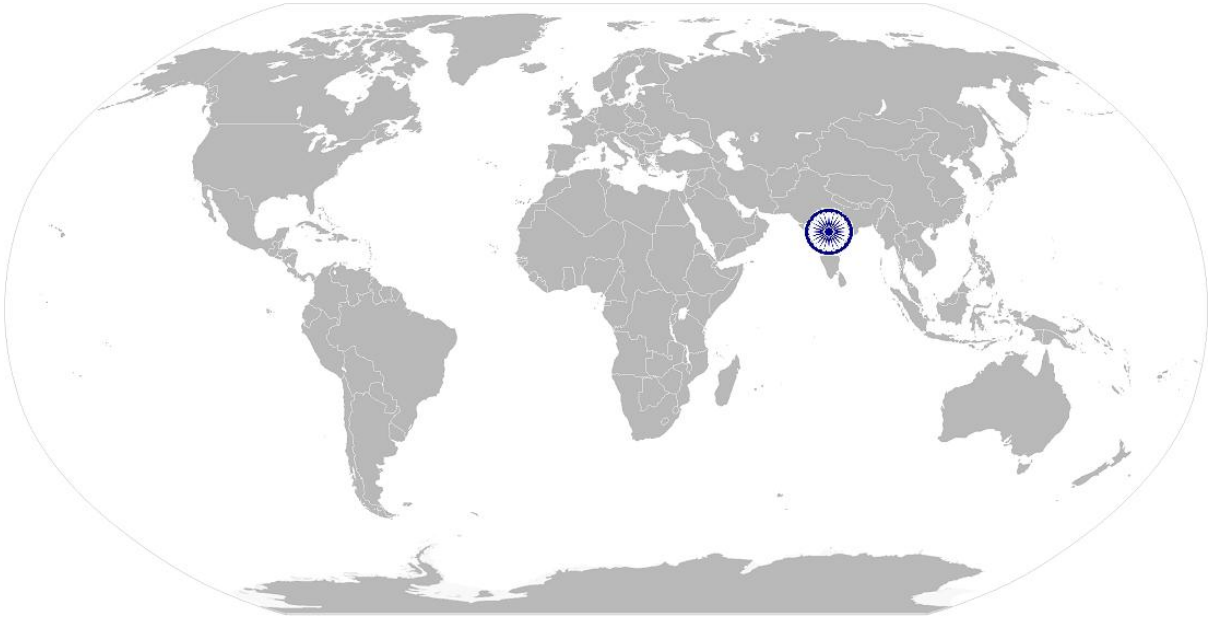
	• Supervisor/manager notified Documents: • Fire notices • Accident reports • Safety instructions for equipment and procedures • Company notices and documents • Legal documents (e.g. Government notices) Job titles: • Health and safety officer • First aid officer • Fire officer PC26. Demonstrate correct method to move injured people and others during an emergency
Element	**Knowledge and Understanding**
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. State the names (and job titles if applicable), and describe where to find, all the people responsible for health and safety in a workplace KA2. State the names and location of documents that refer to health and safety in the workplace
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB3. Meaning of "hazards" and "risks" KB4. Health and safety hazards commonly present in the work environment and related precautions KB5. Possible causes of risk, hazard or accident in the workplace and why risk and/or accidents are possible KB6. Activities and causes of risk and accident KB7. Methods of accident prevention KB8. Safe working practices when working with tools and machines KB9. Safe working practices while working at various hazardous sites KB10. Where to find all the general health and safety equipment in the workplace KB11. Various dangers associated with the use of electrical equipment KB12. Preventative and remedial actions to be taken in the case of exposure to toxic materials. • Exposure: ingested, contact with skin, inhaled • Preventative action: ventilation, masks, protective clothing/equipment • Remedial action: immediate first aid, report to supervisor • Materials: solvents, flux, lead KB13. Importance of using protective clothing/equipment while working KB14. Precautionary activities to prevent the fire accident Activities and causes: • Physical actions • Reading • Listening to and giving instructions

	• Inattention • Sickness and incapacity (e.g. Drunkenness) • Health hazards (e.g. Untreated injuries and contagious illness) KB15. Various causes of fire KB16. Techniques of using the different fire extinguishers KB17. Different methods of extinguishing fire KB18. Rescue techniques applied during a fire hazard KB19. Various types of safety signs and what they mean KB20. Appropriate basic first aid treatment relevant to the condition e.g. Shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries KB21. Content of written accident report KB22. Potential injuries and ill health associated with incorrect manual handing KB23. Safe lifting and carrying practices KB24. Personal safety, health and dignity issues relating to the movement of a person by others KB25. Potential impact to a person who is moved incorrectly
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Reading and Writing Skills
	The user/individual on the job needs to know and understand how to: SA1. Read and comprehend basic content to read labels, charts, signage's SA2. Read and comprehend basic English to read manuals of operations SA3. Read and write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. Question co-workers appropriately in order to clarify instructions and other issues SA5. Give clear instructions to co-workers, subordinates others
	Decision Making
	The user/individual on the job needs to know and understand how to: SA6. Make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down procedure and guidelines
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand: SB1. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity

	Working with others
	The user/individual on the job needs to know and understand how to: SB2. Remain congenial while discussing and debating issues with co-workers SB3. Follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice SB4. Ask for, provide and receive required assistance where possible to ensure achievement of work related objectives SB5. Thank co-workers for any assistance received SB6. Offer appropriate respect based on mutuality and respect for fellow workmanship and authority
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB8. Identify immediate or temporary solutions to resolve delays SB9. Identify sources of support that can be availed of for problem solving for various kind of problems SB10. Seek appropriate assistance from other sources to resolve problems SB11. Report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB12. Identify cause and effect relations in their area of work SB13. Use cause and effect relations to anticipate potential problems and their solution

NOS Version Control

NOS Code	ISC/N0008		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	All departments	Last reviewed on	30/12/2014
Occupation	Electronics & Instrumentation Maintenance	Next review date	30/12/2015



National Occupational Standards

Overview

This unit covers basic practices that improve effectiveness of working with others in an organisational set-up.

National Occupational Standard

Unit Code	ISC/N0009
Unit Title (Task)	Works effectively with others
Description	This unit covers basic etiquette and competencies that a candidate is required to possess and demonstrate in their behaviour and interactions with others at the workplace.
Scope	This unit/task covers the following: • Ensure appropriate communication with superiors, peers and others as applicable at work place • Demonstrate appropriate behaviour and etiquette at work place

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Ensure appropriate communication with superiors, peers and others as applicable at work place	The user/individual on the job should be able to: PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand
Demonstrate appropriate behaviour and etiquette at work place	The user/individual on the job should be able to: PC4. Display helpful behaviour by assisting others in performing tasks in a positive manner, where required and possible PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks PC6. Display appropriate communication etiquette while working PC7. Display active listening skills while interacting with others at work PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism PC9. Demonstrate responsible and disciplined behaviours at the workplace PC10. Escalate grievances and problems to

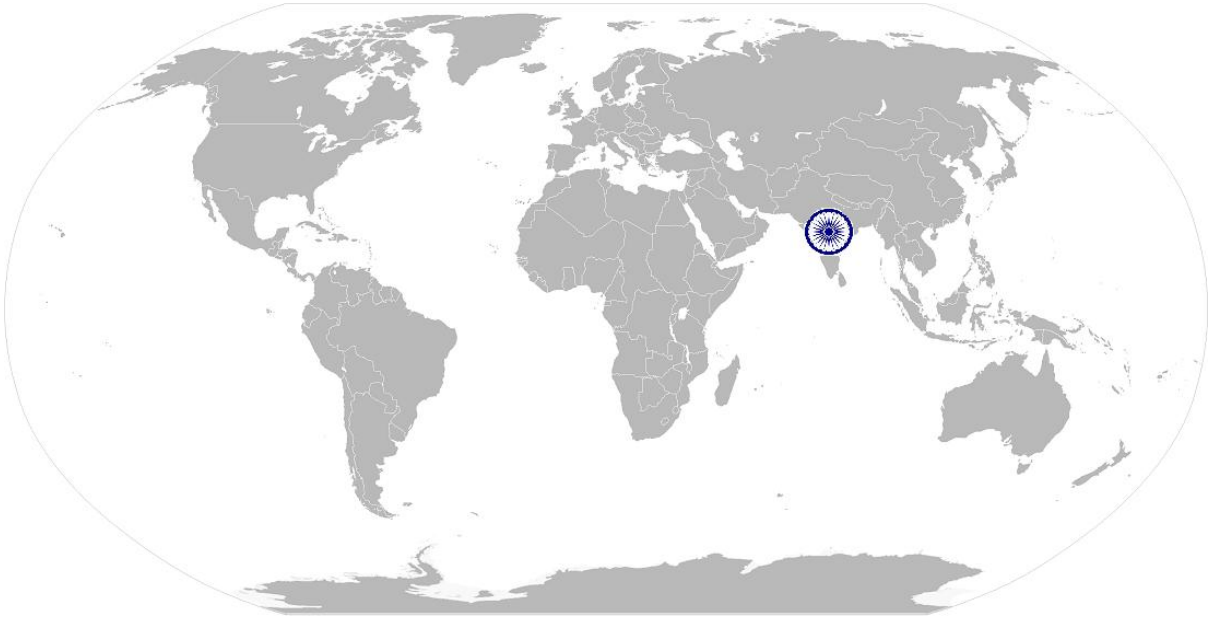
Element	**Knowledge and Understanding**
A. Organisational Context (Knowledge of the Company/ Organisation and its processes)	The user/individual on the job needs to know and understand: KA1. Legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions KA2. Reporting structure, inter-dependent functions, lines and procedures in the work area KA3. Relevant people and their responsibilities within the work area KA4. Escalation matrix and procedures for reporting work and employment related issues

B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. Various categories of people that one is required to communicate and co-ordinate with in the organization KB2. Importance of effective communication in the workplace KB3. Importance of teamwork in organizational and individual success KB4. Various components of effective communication KB5. Key elements of active listening KB6. Value and importance of active listening and assertive communication KB7. Barriers to effective communication KB8. Importance of tone and pitch in effective communication KB9. Importance of avoiding casual expletives and unpleasant terms while communicating professional circles KB10. How poor communication practices can disturb people, environment and cause problems for the employee, the employer and the customer KB11. Importance of ethics for professional success KB12. Importance of discipline for professional success KB13. What constitutes disciplined behaviour for a working professional KB14. Common reasons for interpersonal conflict KB15. Importance of developing effective working relationships for professional success KB16. Expressing and addressing grievances appropriately and effectively KB17. Importance and ways of managing interpersonal conflict effectively
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Reading and Writing Skills
	The user/individual on the job needs to know and understand how to: SA1. Read and comprehend basic content to read labels, charts, signage's SA2. Read and comprehend basic English to read manuals of operations SA3. Read and write an accident/incident report in local language or English
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. Question co-workers appropriately in order to clarify instructions and other issues SA5. Provide clear instructions to co-workers, subordinates others
	Decision Making
	The user/individual on the job needs to know and understand how to: SA6. Make appropriate decisions pertaining to the concerned area of work with respect to intended work objective, span of authority, responsibility, laid down

	procedure and guidelines
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand: SB1. Plan and organize their own work schedule, work area, tools, equipment and materials to maintain decorum and for improved productivity
	Working with others
	The user/individual on the job needs to know and understand how to: SB2. Remain congenial while discussing and debating issues with co-workers SB3. Follow appropriate protocols for communication based on situation, hierarchy, organizational culture and practice SB4. Ask for, provide and receive required assistance where possible to ensure achievement of work related objectives SB5. Thank co-workers for any assistance received SB6. Offer appropriate respect based on mutuality and respect for fellow workmanship and authority
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB7. Think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB8. Identify immediate or temporary solutions to resolve delays SB9. Identify sources of support that can be availed of for problem solving for various kind of problems SB10. Seek appropriate assistance from other sources to resolve problems SB11. Report problems that you cannot resolve to appropriate authority
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB12. Identify cause and effect relations in their area of work SB13. Use cause and effect relations to anticipate potential problems and their solution

NOS Version Control

NOS Code	ISC/N0009		
Credits(NSQF)	TBD	Version number	1.0
Industry	Iron and steel	Drafted on	23/07/2014
Industry Sub-sector	All departments	Last reviewed on	30/12/2014
Occupation	Electronics & Instrumentation Maintenance	Next review date	30/12/2015



CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role: Iron & Steel – Fitter: Electronic Assembly
Qualification Pack: ISC/Q1101
Sector Skill Council: Indian Iron & Steel Sector Skill Council

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 center (as per assessment criteria below)
4. Individual assessment agencies will create unique evaulations for skill practical for every student at each examination/training center based on this criteria.
5. To pass the Qualification Pack , every trainee should score a minimum of 60% in every NOS.
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

				Marks Allocated	
NOSs	PCs	Total Marks 1000	Out Of	Theory	Practical
ISC/N1101: Assemble and wire up electronic equipment and systems to mechanical equipment	PC1. Adhere to procedures or systems in place for safety, including personal protective equipment (PPE), other relevant health and safety regulations and guidelines	750	22	6	16
	PC2. Ensure that the components are free from damage, foreign objects, dirt or other contamination		40	15	25
	PC3. Check that tools and equipment to be used are in a safe, tested, calibrated and usable condition		30	10	20
	PC4. Where appropriate, apply procedures and precautions to eliminate electrostatic discharge (ESD) hazards (e.g. the use of grounded wrist straps and mats)		30	10	20

	PC5. Follow the relevant instructions, assembly drawings and any other specifications		30	10	20
	PC6. Ensure that the specified components are available and that they are in a usable condition		30	10	20
	PC7. Obtain, check and prepare consumables and specialized tools to be used for the wiring and interconnections		26	6	20
	PC8. Use the appropriate methods and techniques to assemble the components in their correct positions		45	15	30
	PC9. Secure the components using the specified connectors and securing devices		30	10	20
	PC10. Obtain, check and prepare components, and complete the preparatory assembly		55	20	35
	PC11. Check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification		44	14	30
	PC12. Select the appropriate software		60	30	30
	PC13. Load appropriate software on electronic components in accordance with laid down procedures		80	30	50
	PC14. Check the output of software as per procedure		66	30	36
	PC15. Check the functionality of the completed electronic assembly		60	30	30
	PC16. Leave the work area in a safe and tidy condition on completion of the electrical equipment assembly activities use the correct issue of drawings, job instructions and specifications		22	6	16
	PC17. Follow risk assessment procedures and regulations		22	6	16
	PC18. Follow clean work area protocols		14	4	10
	PC19. Carry out the assembling and wiring activities in line with organizational procedures		14	4	10

	PC20. Create and store records of the activities, in accordance with appropriate procedures		30	10	20
		Total	750	276	474
ISC/N0008: Use basic health and safety practices at the workplace	PC1. Use protective clothing/equipment for specific tasks and work conditions	150	9	4	5
	PC2. State the name and location of people responsible for health and safety in the workplace		6	1	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		2	1	1
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		8	4	4
	PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		6	1	5
	PC6. State location of general health and safety equipment in the workplace		6	1	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		6	1	5
	PC8. Work safely in and around trenches, elevated places and confined areas		6	1	5
	PC9. Lift heavy objects safely using correct procedures		6	1	5
	PC10. Apply good housekeeping practices at all times		2	1	1
	PC11. Identify common hazard signs displayed in various areas		6	5	1
	PC12. Retrieve and/or point out documents that refer to health and safety in the workplace		5	1	4
	PC13. Use the various appropriate fire extinguishers on different types of fires correctly		9	4	5
	PC14. Demonstrate rescue techniques applied during fire hazard		8	4	4
	PC15. Demonstrate good housekeeping in order to prevent fire hazards		2	1	1

	PC16. Demonstrate the correct use of a fire extinguisher		6	1	5
	PC17. Demonstrate how to free a person from electrocution		6	1	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		8	3	5
	PC19. Demonstrate basic techniques of bandaging		6	1	5
	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		7	2	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		6	1	5
	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 simulated cases		6	1	5
	PC23. Demonstrate the artificial respiration and the CPR Process		6	1	5
	PC24. Participate in emergency procedures		6	1	5
	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		2	1	1
		Total	150	45	105
ISC/N0009: Works effectively with others	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	10	5	5

	PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	5	5
	PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		10	0	10
	PC4. Display helpful behaviour by assisting others in performing tasks in a positive manner, where required and possible		10	5	5
	PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	5	5
	PC6. Display appropriate communication etiquette while working		10	0	10
	PC7. Display active listening skills while interacting with others at work		10	0	10
	PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	5	5
	PC9. Demonstrate responsible and disciplined behaviours at the workplace		15	5	10
	PC10. Escalate grievances and problems to supervisor		5	0	5
		Total	100	30	70