

### Qualification Pack



## Industrial Electrician (Oil & Gas)

QP Code: HYC/Q6101

Version: 3.0

NSQF Level: 4

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## Qualification Pack

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## Qualification Pack

### HYC/Q6101: Industrial Electrician (Oil & Gas)

#### Brief Job Description

Industrial Electrician installs, maintains, and performs repair work of electrical, electronic, and electrical wiring for well-functioning in an industrial environment specially in petroleum refinery and Demonstrable ability to use electrical and hand tools and electrical drawings and blueprints He has a thorough knowledge of safety procedures and legal regulations and guidelines.

#### Personal Attributes

The individual should have a good sense of responsibility, must be alert at all times, ability to work independently, concentrate on work, all to work as a team and Stress Management Skills.

#### Applicable National Occupational Standards (NOS)

##### Compulsory NOS:

1. [HYC/N6101: Job requirements and related processes](#)
2. [HYC/N6102: Industrial Electrical wiring](#)
3. [DGT/VSQ/N0102: Employability Skills \(60 Hours\)](#)
4. [HYC/N9301: Working Effectively in a team](#)
5. [HYC/N9302: Maintain health, safety and security procedures](#)

#### Qualification Pack (QP) Parameters

<b>Sector</b>	Hydrocarbon
<b>Sub-Sector</b>	Downstream
<b>Occupation</b>	Operations - Oil and Gas pipeline, Operations - Oil and Gas pipeline
<b>Country</b>	India
<b>NSQF Level</b>	4
<b>Credits</b>	19
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/3122.1400

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<b>Minimum Educational Qualification &amp; Experience</b>	10th grade pass (with 2-years relevant experience) OR 12th grade Pass OR 10th grade pass (plus 2-year of National Trade Certificate (NTC) in relevant field) OR Completed 2nd year of the 3-year diploma after 10 (in relevant field and pursuing regular Diploma)
<b>Minimum Level of Education for Training in School</b>	10th Class
<b>Pre-Requisite License or Training</b>	
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	NA
<b>Next Review Date</b>	28/02/2026
<b>NSQC Approval Date</b>	17/11/2022
<b>Version</b>	3.0
<b>Reference code on NQR</b>	2022/HYC/HSSCI/06770
<b>NQR Version</b>	3

### Remarks:

NA

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### HYC/N6101: Job requirements and related processes

#### Description

Industrial electricians are responsible for smooth functioning of electrical work in an industry

#### Scope

The scope covers the following :

- The person will be able to do wiring work in the installation, repair and maintenance of electrical system.

#### Elements and Performance Criteria

##### *wiring work in the installation*

To be competent, the user/individual on the job must be able to:

- PC1.** understand health and safety legislation, obligations and documentation
- PC2.** diagnostic approaches to problem solving
- PC3.** diligently follow electrical safety procedures
- PC4.** follow the situations when personal protective equipment must be used
- PC5.** identify and use the appropriate personal protective equipment including safety footwear, ear and eye protection
- PC6.** introduce related trades to support customer requirements
- PC7.** the common types of problem which can occur within the work process
- PC8.** the importance of keeping a tidy work area
- PC9.** the principles of working safely with electricity
- PC10.** trends and developments in the industry including new technology,
- PC11.** work efficiently and check progress and outcomes regularly

##### *Understand the basics drawings*

To be competent, the user/individual on the job must be able to:

- PC12.** able to understand clearly the basics of engineering drawing and how to make simple drawing.
- PC13.** able to draft and illustrate engineering drawing.
- PC14.** use engineering drawing- equipment, mini drafter etc.
- PC15.** ability to prepare drawing as per standard.
- PC16.** understand projections isometric, orthographic projections first angle and third angle projects free hand sketching
- PC17.** understand dimensioning and tolerance and its importance dimension lines as per sp-46 tolerance, application and examples
- PC18.** draw ,read, interpret and revise drawings and documentation including: read, interpret and revise drawings and documentation including: layout and circuit drawings follow written instructions

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**PC19.** make wiring diagram including the following items dol starter star delta starter auto transformer starter rotor resistor starter control of 2 lamps from various positions

**PC20.** able to make dimensional drawing of d.c machine parts alternator stator without winding alternator rotor for smooth cylindrical type

**PC21.** draw sketches of the following as per bis specifications earthing installation double pole structure for lt and ht distribution line

**PC22.** generate single line diagram of single line diagram of 33/11kva distribution substation single line diagram of 11/440 v distribution substation

**PC23.** ability to use the computer to generate cad for electrical drawing as follows draw electrical symbols draw d.c machine parts (take printout) draw a.c machine parts (take printout) a.c and d.c winding diagram draw electrical layout of electrical installation of a building

### *Mathematical skills with respect to electrician*

To be competent, the user/individual on the job must be able to:

**PC24.** understand basic mathematical calculation.revision of arithmetics units of metric, iso and fps addition subtraction multiplication and division

**PC25.** select and apply basic calculation of area and volume area of a square, rectangle, triangle and circle volume of a cube, cuboid, cylinder, sphere and hemisphere

**PC26.** use appropriate mathematical concepts and skills to solve problems in fractions, decimals, percentage and ratio conversion of fraction to decimals conversion of decimals to fractions problems in percentage and ratio and averages

**PC27.** develop ability to perform basics of algebra and understand simple algebraic equations and problems

**PC28.** acquire the techniques of solving simple trigonometric problems introduction to sine, cosine and tan functions pythagoras theorem identifies and simple problems.

### *Knowledge on different types of materials used*

To be competent, the user/individual on the job must be able to:

**PC29.** ability to apply knowledge of metals and non-metals

**PC30.** ability to identify ferrous and non-ferrous metals

**PC31.** ability to integrate steel - properties and applications of the following: carbon steels and alloy steels

**PC32.** apply the basic principles of material selection to specific applications stainless steel non-ferrous metal -properties and applications of the following: - copper and its alloys aluminium and its alloys

**PC33.** explain the differences in properties of different materials, including metals, alloys, ceramics, polymers and composites

### *Knowledge on basic workshop practice and tools used*

To be competent, the user/individual on the job must be able to:

**PC34.** able to work independently or as part of a team in the following areas, filing files types, specification, application care and maintenance filing straight filing, cross filing vices types and its application safety

**PC35.** understand the task required and plan ahead what steps must be taken to achieve the outcome.hack sawing types of hack saw blades, specification application hack sawing-selection of blade, fixing blade, hack sawing procedure safety and precautions

**PC36.** carry out marking on the materials as per the drawing usingmarking scribes, dot punch, centre punch, letter and no punches scribing and punching procedure

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**PC37.** able to do the drilling as per following specification of drills selection of drills, drilling machine- types specification application ,care and maintenance. tools holding methods, work holding methods, determination of rpm

**PC38.** set up and adjust metalworking tools and do threading tapping specification of taps, determination of tap drill size for tapping, tapping procedure and care

**PC39.** set up and/or operate hand toolschisels types of chisels, specification, application, precautions to be taken while chiselling.

**PC40.** correctly use and maintain the tools hammers types of hammers, specification, applicationspanners types, specification, application fasteners types, specification, application

**PC41.** measure and mark materials as per the drawing and check accuracy and quality of finished partsmeasuring / checking instruments steel rule and tape- application, specification and care inside and outside calliper- application, specification and care vernier calliper- application, specification and care micro meter- application, specification and care radius and fillet gauges, use and care weld gauges to verify size of weld.

**PC42.** knowledge and ability to use different hand tools and power tools in plumbing and appreciate the advantage of correct tools used.

*Knowledge on basic electronics*

To be competent, the user/individual on the job must be able to:

**PC43.** understand the basics of fundamentals of electronics and also to select and install

**PC44.** knowledge of active & passive components and where are they used

**PC45.** knowledge of different application and use of electronics devices, diode- rectifier, logic gate wave shaping circuits, transistor amplifier, switch, impedance matching, oscillator circuit, ujt-relaxation oscillator.

**PC46.** knowledge of the basics of digital electronics

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** companys policies on: personnel management, duty reporting procedure and associated mis compliance

**KU2.** legislation, standards, policies, and procedures followed in the company relevant to own employment and performance conditions

**KU3.** own job role and responsibilities and sources for information pertaining to employment terms, entitlements, job role and responsibilities

**KU4.** reporting structure within organization and relevant people and their responsibilities within the work area

**KU5.** problem escalation procedure and escalation matrix for reporting work and employment related issues

**KU6.** standard operating procedure while working

**KU7.** relevant health and safety requirements applicable in the work place

**KU8.** importance of working in clean and safe environment

**KU9.** documentation and related procedures applicable in the context of employment and work

**KU10.** importance and purpose of documentation in context of employment and work

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- KU11.** should be able to use automation and as tool and has an idea of : basics of microprocessor and its applications basics micro controller and its applications basics of plc system and its functions application of plc system in electrical control system
- KU12.** application of power electronics and its use in different fields power transistor scr (silicon control rectifier) mosfet (metal oxide semiconductor field effect transistor) igt ( insulated gate bipolar transistor)
- KU13.** Knowledge on thermal power generation Thermal power plant operation Functional diagram of thermal power generation
- KU14.** How mechanical maintenance of electric motor is done Removing and fixing bearings Dismantling, cleaning of motors Aligning couplings Basics of gear and belt drives Lubrication Study of electrical equipment open cost mine industry Study of electrical equipment under cost mine industry
- KU15.** correct termination adaptors used for entry of conduits into boxes, boards and ducts
- KU16.** diagnose electrical installations and identify problems including: bad connections, incorrect wiring, high loop impedance and equipment failure
- KU17.** install and securely attach different types of cable ladder and cable tray to a surface
- KU18.** install and securely fix double insulated cables onto cable ladder, cable tray and different surfaces as per manufacturers instructions and current industrial standards
- KU19.** install metal and plastic conduits/flexible conduits and attach securely onto surface, maintaining even radius bends, without distortion to conduit
- KU20.** repair and replace faulty components in electrical installations
- KU21.** rewire and or repair faulty installations
- KU22.** select and install single and double insulated cables inside ducts, conduits and flexible conduits
- KU23.** troubleshoot electrical installations and identify faults including: short and open circuits, incorrect polarity, insulation resistance and earth continuity faults, incorrect settings on equipment and incorrect program on programmable devices
- KU24.** use, test and calibrate measuring equipment including: insulation resistance, continuity and installation testers, multi, clamp and network cable testers
- KU25.** verify that an existing electrical installation still meets current standards

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** fill in the attendance sheet and the requisite details
- GS2.** keep abreast by reading about new policies at an organization level
- GS3.** 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
- GS4.** fill up appropriate technical forms, process charts, activity logs as per organizational format in English and/or local language
- GS5.** execute task, schedules, and work-loads with co-workers and supervisors
- GS6.** convey and share technical information clearly using appropriate language
- GS7.** check and clarify task-related information

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- GS8.** liaise with appropriate authorities using correct protocol
- GS9.** communicate with people in respectful form and manner in line with organizational protocol
- GS10.** share work load as required
- GS11.** assist others who require help
- GS12.** share knowledge with co-workers/assistant.
- GS13.** Undertake numerical operations, and calculations using calculators Numerical computations: addition (with decimal digits and with carrying), subtraction (with decimal digits and with borrowing), multiplication (with decimal digits), division (with decimal digit), fractions and decimals, percentages and proportions, simple ratios and averages
- GS14.** identify and draw various basic, compound and solid shapes as per dimensions given Basic shapes: square, rectangle, triangle, circle Compound shapes: involving squares, rectangles, triangles, circles, semi-circles, quadrants of a circle Solid shapes: cube, rectangular prism, cylinder
- GS15.** demonstrate measurement and calculation of Angle, Perimeter, Area of a common geometrical shape and can co-relate with job area requirements
- GS16.** use appropriate measuring techniques and units of measurement
- GS17.** use British and metric system of measurement and make conversions between them
- GS18.** describe the difference between Celsius & Fahrenheit Scale and relationship between them
- GS19.** use appropriate units and number systems to express degree of accuracy Units and number systems representing degree of accuracy: decimals places, significant figures, fractions as a decimal quantity
- GS20.** interpret and express tolerance in terms of limits on dimensions perform
- GS21.** basic operations in a computer like switching it on/off, using the mouse and keyboard, accessing files, opening, closing, creating and deleting folders, etc.
- GS22.** use basic office applications like spread sheet, word processor, presentations
- GS23.** use organizational software specific to quality function
- GS24.** use email to communicate within the organization as per organization guidelines
- GS25.** retrieve and enter data using standard system forms and templates
- GS26.** take printouts of documents
- GS27.** identify problems with work planning, procedures, output and behaviour and their implications
- GS28.** prioritize and plan for problem solving
- GS29.** communicate problems appropriately to others
- GS30.** identify sources of information and support for problem solving
- GS31.** seek assistance and support from other sources to solve problems
- GS32.** identify effective resolution techniques
- GS33.** select and apply resolution techniques
- GS34.** seek evidence for problem resolution
- GS35.** plan, prioritize and sequence work operations as per job requirements
- GS36.** organize and analyse information relevant to work
- GS37.** basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time

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- GS38.** undertake and express new ideas and initiatives to others
- GS39.** modify work plan to overcome unforeseen difficulties or developments that occur as work progresses
- GS40.** ones competencies in new and different situations and contexts to achieve more
- GS41.** exercise restraint while expressing dissent and during conflict situations
- GS42.** avoid and manage distractions to be disciplined at work
- GS43.** manage own time for achieving better results
- GS44.** work in a team in order to achieve better results
- GS45.** identify and clarify work roles within a team
- GS46.** communicate and cooperate with others in the team for better results
- GS47.** seek assistance from fellow team members

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### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>wiring work in the installation</i>	<b>5.5</b>	<b>5</b>	-	-
<b>PC1.</b> understand health and safety legislation, obligations and documentation	0.5	-	-	-
<b>PC2.</b> diagnostic approaches to problem solving	0.5	0.5	-	-
<b>PC3.</b> diligently follow electrical safety procedures	0.5	0.5	-	-
<b>PC4.</b> follow the situations when personal protective equipment must be used	0.5	0.5	-	-
<b>PC5.</b> identify and use the appropriate personal protective equipment including safety footwear, ear and eye protection	0.5	0.5	-	-
<b>PC6.</b> introduce related trades to support customer requirements	0.5	0.5	-	-
<b>PC7.</b> the common types of problem which can occur within the work process	0.5	0.5	-	-
<b>PC8.</b> the importance of keeping a tidy work area	0.5	0.5	-	-
<b>PC9.</b> the principles of working safely with electricity	0.5	0.5	-	-
<b>PC10.</b> trends and developments in the industry including new technology,	0.5	0.5	-	-
<b>PC11.</b> work efficiently and check progress and outcomes regularly	0.5	0.5	-	-
<i>Understand the basics drawings</i>	<b>6</b>	<b>6</b>	-	-
<b>PC12.</b> able to understand clearly the basics of engineering drawing and how to make simple drawing.	0.5	0.5	-	-
<b>PC13.</b> able to draft and illustrate engineering drawing.	0.5	0.5	-	-
<b>PC14.</b> use engineering drawing- equipment, mini drafter etc.	0.5	0.5	-	-
<b>PC15.</b> ability to prepare drawing as per standard.	0.5	0.5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC16.</b> understand projections isometric, orthographic projections first angle and third angle projects free hand sketching	0.5	0.5	-	-
<b>PC17.</b> understand dimensioning and tolerance and its importance dimension lines as per sp-46 tolerance, application and examples	0.5	0.5	-	-
<b>PC18.</b> draw ,read, interpret and revise drawings and documentation including: read, interpret and revise drawings and documentation including: layout and circuit drawings follow written instructions	0.5	0.5	-	-
<b>PC19.</b> make wiring diagram including the following items dol starter star delta starter auto transformer starter rotor resistor starter control of 2 lamps from various positions	0.5	0.5	-	-
<b>PC20.</b> able to make dimensional drawing of d.c machine parts alternator stator without winding alternator rotor for smooth cylindrical type	0.5	0.5	-	-
<b>PC21.</b> draw sketches of the following as per bis specifications earthing installation double pole structure for lt and ht distribution line	0.5	0.5	-	-
<b>PC22.</b> generate single line diagram of single line diagram of 33/11kva distribution substation single line diagram of 11/440 v distribution substation	0.5	0.5	-	-
<b>PC23.</b> ability to use the computer to generate cad for electrical drawing as follows draw electrical symbols draw d.c machine parts (take printout) draw a.c machine parts (take printout) a.c and d.c winding diagram draw electrical layout of electrical installation of a building	0.5	0.5	-	-
<i>Mathematical skills with respect to electrician</i>	<b>2.5</b>	<b>2.5</b>	-	-
<b>PC24.</b> understand basic mathematical calculation.revision of arithmetics units of metric, iso and fps addition subtraction multiplication and division	0.5	0.5	-	-
<b>PC25.</b> select and apply basic calculation of area and volume area of a square, rectangle, triangle and circle volume of a cube, cuboid, cylinder, sphere and hemisphere	0.5	0.5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC26.</b> use appropriate mathematical concepts and skills to solve problems in fractions, decimals, percentage and ratio conversion of fraction to decimals conversion of decimals to fractions problems in percentage and ratio and averages	0.5	0.5	-	-
<b>PC27.</b> develop ability to perform basics of algebra and understand simple algebraic equations and problems	0.5	0.5	-	-
<b>PC28.</b> acquire the techniques of solving simple trigonometric problems introduction to sine, cosine and tan functions pythagoras theorem identifies and simple problems.	0.5	0.5	-	-
<i>Knowledge on different types of materials used</i>	<b>2.5</b>	<b>2</b>	-	-
<b>PC29.</b> ability to apply knowledge of metals and non-metals	0.5	0.5	-	-
<b>PC30.</b> ability to identify ferrous and non-ferrous metals	0.5	0.5	-	-
<b>PC31.</b> ability to integrate steel - properties and applications of the following: carbon steels and alloy steels	0.5	0.5	-	-
<b>PC32.</b> apply the basic principles of material selection to specific applications stainless steel non-ferrous metal -properties and applications of the following: - copper and its alloys aluminium and its alloys	0.5	-	-	-
<b>PC33.</b> explain the differences in properties of different materials, including metals, alloys, ceramics, polymers and composites	0.5	0.5	-	-
<i>Knowledge on basic workshop practice and tools used</i>	<b>4.5</b>	<b>4.5</b>	-	-
<b>PC34.</b> able to work independently or as part of a team in the following areas, filing files types, specification, application care and maintenance filing straight filing, cross filing vices types and its application safety	0.5	0.5	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC35.</b> understand the task required and plan ahead what steps must be taken to achieve the outcome.hack sawing types of hack saw blades, specification application hack sawing-selection of blade, fixing blade, hack sawing procedure safety and precautions	0.5	0.5	-	-
<b>PC36.</b> carry out marking on the materials as per the drawing usingmarking scribes, dot punch, centre punch, letter and no punches scribing and punching procedure	0.5	0.5	-	-
<b>PC37.</b> able to do the drilling as per following specification of drills selection of drills, drilling machine- types specification application ,care and maintenance. tools holding methods, work holding methods, determination of rpm	0.5	0.5	-	-
<b>PC38.</b> set up and adjust metalworking tools and do threading tapping specification of taps, determination of tap drill size for tapping, tapping procedure and care	0.5	0.5	-	-
<b>PC39.</b> set up and/or operate hand toolschisels types of chisels, specification, application, precautions to be taken while chiselling.	0.5	0.5	-	-
<b>PC40.</b> correctly use and maintain the tools hammers types of hammers, specification, applicationspanners types, specification, application fasteners types, specification, application	0.5	0.5	-	-
<b>PC41.</b> measure and mark materials as per the drawing and check accuracy and quality of finished partsmeasuring / checking instruments steel rule and tape- application, specification and care inside and outside calliper- application, specification and care vernier calliper- application, specification and care micro meter- application, specification and care radius and fillet gauges, use and care weld gauges to verify size of weld.	0.5	0.5	-	-
<b>PC42.</b> knowledge and ability to use different hand tools and power tools in plumbing and appreciate the advantage of correct tools used.	0.5	0.5	-	-
<i>Knowledge on basic electronics</i>	<b>2</b>	<b>2</b>	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC43.</b> understand the basics of fundamentals of electronics and also to select and install	0.5	0.5	-	-
<b>PC44.</b> knowledge of active & passive components and where are they used	0.5	0.5	-	-
<b>PC45.</b> knowledge of different application and use of electronics devices, diode- rectifier, logic gate wave shaping circuits, transistor amplifier, switch, impedance matching, oscillator circuit, ujt-relaxation oscillator.	0.5	0.5	-	-
<b>PC46.</b> knowledge of the basics of digital electronics	0.5	0.5	-	-
<b>NOS Total</b>	<b>23</b>	<b>22</b>	-	-

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### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	HYC/N6101
<b>NOS Name</b>	Job requirements and related processes
<b>Sector</b>	Hydrocarbon
<b>Sub-Sector</b>	Downstream
<b>Occupation</b>	Refinery Operations
<b>NSQF Level</b>	4
<b>Credits</b>	6
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022

## Qualification Pack

### HYC/N6102: Industrial Electrical wiring

#### Description

Industrial electrician installs, maintain, services and repairs wiring and other electrical devices and systems in an industry

#### Scope

The scope covers the following :

- Person will be able to do wiring at oil & gas industries

#### Elements and Performance Criteria

##### *Basics of Electricity*

To be competent, the user/individual on the job must be able to:

- PC1.** understand the principle of electricity
- PC2.** will be able to define voltage, resistor, current, power
- PC3.** the importance of basic laws ohms law, kvl & kcl)
- PC4.** the principles d.c circuits (source, load)
- PC5.** understand the basics of cell and battery
- PC6.** the correct operation of the electrical installation in accordance with the planned specification

##### *Single Phase and Poly Phase System*

To be competent, the user/individual on the job must be able to:

- PC7.** able to install of various electrical power supplies, such as single phase, three-phase, direct current and low voltage.
- PC8.** follow the terminologies amplitude, phase angle, cycle, frequency, power power factor
- PC9.** read , understand and interpret drawings and documentation including 1 system through rlc circuits with phase diagram 3 system- generation of 3 system 3 type 1.star, 2.delta
- PC10.** understand conversion of star to delta and conversion of delta to star

##### *Knowledge of Indian Electrical Rules (ie Rules)*

To be competent, the user/individual on the job must be able to:

- PC11.** understand indian electrical standard rules.
- PC12.** awareness of rules and regulation of electrical inspectorate other standardize authority
- PC13.** industrial regulations and standards applicable to different types of installations
- PC14.** verification standards, methods and reports to be used to record verification results

##### *Usage of Different Types of Wiring*

To be competent, the user/individual on the job must be able to:

- PC15.** diligently follow electrical safety procedures
- PC16.** identify and use the appropriate personal protective equipment including safety footwear, ear and eye protection

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- PC17.** select, use, clean, maintain and store all tools and equipment safely
- PC18.** read, interpret and revise drawings and documentation including: layout and circuit drawings follow written instructions
- PC19.** plan installation work using drawings and documentation provided
- PC20.** ducting and wiring systems for commercial, domestic, residential, godown, agricultural and industrial use and when and where to use a specific ducting and/or wiring system
- PC21.** the range of electrical switchboards used for commercial, domestic, residential, agricultural and industrial uses and when and where to use a specific switchboard system including staircase wiring and master control wiring
- PC22.** types of electric lighting and heating systems for commercial, domestic residential and industrial use
- PC23.** understand different control devices and socket outlets used for commercial, domestic, residential, agricultural and industrial uses
- PC24.** install structured cabling systems including: computer network cabling, fire/burglar alarm), control and monitoring, access control closed circuit television.

### *Industrial Wiring*

To be competent, the user/individual on the job must be able to:

- PC25.** plan installation work using drawings and documentation provided
- PC26.** trends and developments in the industry including new technology, standards and working methods.
- PC27.** range of materials and installation techniques to be used in different environments
- PC28.** different types of standards, drawings, installation descriptions and manuals
- PC29.** assemble different termination adaptors, including glands onto duct and attach ducts, of different types, securely onto a surface
- PC30.** able to use direct on line start (both power line and control) star delta stator

### *Illumination Specification Application Of Different Elements Of Circuits*

To be competent, the user/individual on the job must be able to:

- PC31.** different types of installations for fluorescent light metal halide high pressure mercury vapour high pressure sodium vapour led flame proof lighting fixtures

### *Transformer Care and Maintenances*

To be competent, the user/individual on the job must be able to:

- PC32.** select and install equipment as per drawings and documentation provided
- PC33.** understand the following elements parts of transformer working principle and construction types of transformer and its use (single phase & poly phase) spatial transformer (auto, ct, pt) construction and its application maintenance of transformer oil testing and filtration inspection of silica gel, breather, conservator, temperature maintenance of ht and lt transformers yards

### *Motor*

To be competent, the user/individual on the job must be able to:

- PC34.** connect a.c motor as per instructions provided to include: structured cabling systems as per manufacturers instructions and current industrial standards and regulations
- PC35.** understand the working a.c motor and its construction
- PC36.** how the classification of a.c motor (synchronous and asynchronous) is done

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- PC37.** the working and type of single phase motor and its working and poly phase (3 phase) and its working
- PC38.** set-up equipment to speed control and torque control of ac motor
- PC39.** advantage of ac drive system
- PC40.** ability for assembling and replacing of bearing with proper equipments, referring to the standard catalogue.
- PC41.** troubleshoot and take general care maintenance of ac motor

### *D.C Motor*

To be competent, the user/individual on the job must be able to:

- PC42.** different types of dc motors and the following details motor construction and working type of dc motor torque equation of dc motor characteristics of dc motor application of dc motor speed control of dc motor dc drive system general care maintenance of dc motor
- PC43.** the importance of special electrical motor in relation to petro chemical industry universal motor servo motor stepper motor brush less a.c motor and brush less d.c motor flame proof motors, specification, application, care & maintenance

### *Generator*

To be competent, the user/individual on the job must be able to:

- PC44.** install the required electrical supply systems including transformers, generators, circuit breakers, isolators, bus bars, measuring equipment for voltage, current, power, energy, frequency, rpm, wiring, fuses, earthing, switchboard, control panels, relays etc. as per the required specifications.
- PC45.** conduct a test process to ensure the performance of installed electrical equipment as per the defined specifications
- PC46.** understand the different elements of generator as below: construction and working of generator characteristics of generator type of dc generator emf equation application of dc generator maintenance with abc type alternator construction & characteristics types, application & maintenance of alternator diesel generator care & maintenance basics of engine basics of fuel system, basics of air system, basics of lubrication system, basics of cooling system dg control panel. general maintenance

### *Study of Single Line Diagram of Electrical Wiring System*

To be competent, the user/individual on the job must be able to:

- PC47.** pc47. read, interpret and study drawings and documentation including: layout and circuit drawings follow written instructions
- PC48.** plan installation work using drawings and documentation provided
- PC49.** understand and read the symbol of electrical parts
- PC50.** ability to connect and track of electrical diagram
- PC51.** able to properly layout structure of substation and work instruction

### *Circuit Breaker/ Switch Gear Care and Maintenance*

To be competent, the user/individual on the job must be able to:

- PC52.** install electrical switchboards onto a surface in a secure way and assemble switchboard apparatus in a switchboard as per layout drawings
- PC53.** test installations before energizing and check for proper connection
- PC54.** test installations when energized by checking complete function on all equipment and installed to ensure correct operation of new installation as per instructions

## Qualification Pack

**PC55.** understand the working of the following elements definition and use of circuit breaker type of switch spst, spdt, dpst, dpdt, toggle switch, pushbutton switch, level actuator, limit switch, selector switch, flame proof switch types of circuit breaker

### *Cable and Cable Joints*

To be competent, the user/individual on the job must be able to:

**PC56.** identify cable types and sizes types of cables, specification current rating, application

**PC57.** identify sub-circuits and determine cable for connection of security control panel.

**PC58.** install and terminate cable to connect security control panel to existing sub-circuit.

**PC59.** knowledge of flame proof cables specification, application, care & maintenance.

**PC60.** inspect, test, rectify abnormal conditions, and commission connection of circuit.

**PC61.** the ability to different joints in the cable straight through, long routes and repaired section branch y joints for branch of a sector t- joint for branching of a sector transition joints special joint between two different types of cable

**PC62.** troubleshoot electrical installations and identify faults in cable

### *Earthing System*

To be competent, the user/individual on the job must be able to:

**PC63.** understand earth attachment positions on conductors, plant and equipment and the local earth are described in terms of earthing terminals, tail clamp attachment points, clamp rating and compatibility.

**PC64.** check earthing in terms of portable earths, voltage rating, fault level, and conductor rating.

**PC65.** ability to do earthing compliance requirements are described in terms of acceptable surface condition and cleanliness; and clamps, leads, fittings, sticks and poles, and terminations.

**PC66.** understand the importance of importance of earthing in electrical and hazard system types of earthing system desired value measurement of earth resistance earthing in transformer earthing in substation

### *Power System and Measurement*

To be competent, the user/individual on the job must be able to:

**PC67.** explain the type and working of different stand by power systems like basics of ups, online and offline basics of inverter and its controls basics of cells and battery and rating care and maintenance of battery banks and its controls

**PC68.** ability to use different measuring instruments and their calibration digital multimeter and adaptor power meter phase sequence meter clamp on multi meter continuity tester ground fault tester insulation tester (meger) versatile data logger

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** understand companys policies on: personnel management, duty reporting procedure and associated mis compliance

**KU2.** knowledge of principles and processes for providing customer and personal services. this includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction

**KU3.** reviews and approves the requisition of materials/equipment by assigned employees

## Qualification Pack

- KU4.** reviews and approves the requisition of materials/equipment by assigned employees; may tag and store material as necessary
- KU5.** maintains records and prepares reports on repairs completed or on units requiring future special service
- KU6.** works closely with project coordinates, administration, and/or other related staff to determine and coordinate projects, estimating and controlling craft-related project costs, operational needs, troubleshooting, etc.
- KU7.** ability to understand and carry out work direction in a safe manner
- KU8.** importance of working in clean and safe environment
- KU9.** ability to document related procedures applicable in the context of employment and work
- KU10.** knowledge codes, legislation and regulations
- KU11.** what are the installation methods and instrumentation conductors and cables, grounding and bonding
- KU12.** type of distribution equipment, electronics and electrical equipment power distribution protective devices, fluid power
- KU13.** knowledge on pneumatic and hydraulic systems, high voltage systems, and fire alarm, building
- KU14.** understand systems and control systems including programmable logic controller
- KU15.** able to systematically diagnoses faults in electrical and electronic systems and equipment and repairs or replaces electrical and electronic
- KU16.** ability to splices and terminates electrical conductors
- KU17.** do the tests electrical and electronic equipment for proper function
- KU18.** understand magnetism, direct current machines, alternating current circuit theory and single phase transformers
- KU19.** electrical code dealing with commercial wiring practices
- KU20.** introduces the student to the basic principles of fluid mechanics and hydraulic system

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** follow verbal and written instructions
- GS2.** communicate orally and in writing with other team members, leaders and operations personnel
- GS3.** determining personnel matters (such as job progress, schedule changes, time sheet review, and work performance)
- GS4.** knowledge of human resource and supervisory activities, including the coordination and management of people and resources
- GS5.** the user/individual on the job needs to know and understand how to:
- GS6.** work within company policy as outlined
- GS7.** read, write and communicate using english language sufficient to perform job functions
- GS8.** ability to understand and carry out work direction in a safe manner
- GS9.** identifying complex problems and reviewing related information to develop and evaluate options and implement solutions

## Qualification Pack

- GS10.** ability to listen to and understand information and ideas presented through spoken words and sentences
- GS11.** performs other related duties as assigned
- GS12.** ability to apply general rules to specific problems to produce answers that make sense
- GS13.** participates in the management of personnel matters/activities
- GS14.** mathematics knowledge of arithmetic, algebra, geometry, , and their applications
- GS15.** participate in on-the-job and other learning, training and development interventions and assessments
- GS16.** clarify task related information with appropriate personnel or technical adviser
- GS17.** maintain current knowledge of application standards, legislation, codes of practice and product/process developments
- GS18.** identify problems with work planning, procedures, output and behaviour and their implications
- GS19.** prioritize and plan for problem solving
- GS20.** communicate problems appropriately to others
- GS21.** identify sources of information and support for problem solving
- GS22.** seek assistance and support from other sources to solve problems
- GS23.** identify effective resolution techniques
- GS24.** select and apply resolution techniques
- GS25.** seek evidence for problem resolution
- GS26.** plan, prioritize and sequence work operations as per job requirements
- GS27.** organize and analyse information relevant to work
- GS28.** basic concepts of shop-floor work productivity including waste reduction, efficient material usage and optimization of time
- GS29.** undertake and express new ideas and initiatives to others
- GS30.** modify work plan to overcome unforeseen difficulties or developments that occur as work progresses
- GS31.** ones competencies in new and different situations and contexts to achieve more
- GS32.** exercise restraint while expressing dissent and during conflict situations
- GS33.** avoid and manage distractions to be disciplined at work
- GS34.** manage own time for achieving better results
- GS35.** work in a team in order to achieve better results
- GS36.** identify and clarify work roles within a team
- GS37.** communicate and cooperate with others in the team for better results
- GS38.** seek assistance from fellow team members

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Basics of Electricity</i>	<b>5</b>	<b>3</b>	-	-
<b>PC1.</b> understand the principle of electricity	1	-	-	-
<b>PC2.</b> will be able to define voltage, resistor, current, power	1	-	-	-
<b>PC3.</b> the importance of basic laws ohms law, kvl & kcl	0.5	0.5	-	-
<b>PC4.</b> the principles d.c circuits (source, load)	1	1	-	-
<b>PC5.</b> understand the basics of cell and battery	1	1	-	-
<b>PC6.</b> the correct operation of the electrical installation in accordance with the planned specification	0.5	0.5	-	-
<i>Single Phase and Poly Phase System</i>	<b>3</b>	<b>3</b>	-	-
<b>PC7.</b> able to install of various electrical power supplies, such as single phase, three-phase, direct current and low voltage.	1	1	-	-
<b>PC8.</b> follow the terminologies amplitude, phase angle, cycle, frequency, power power factor	0.5	0.5	-	-
<b>PC9.</b> read , understand and interpret drawings and documentation including 1 system through rlc circuits with phase diagram 3 system- generation of 3 system 3 type 1.star, 2.delta	1	1	-	-
<b>PC10.</b> understand conversion of star to delta and conversion of delta to star	0.5	0.5	-	-
<i>Knowledge of Indian Electrical Rules (ie Rules)</i>	<b>3</b>	<b>2</b>	-	-
<b>PC11.</b> understand indian electrical standard rules.	1	1	-	-
<b>PC12.</b> awareness of rules and regulation of electrical inspectorate other standardize authority	0.5	0.5	-	-
<b>PC13.</b> industrial regulations and standards applicable to different types of installations	0.5	0.5	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC14.</b> verification standards, methods and reports to be used to record verification results	1	-	-	-
<i>Usage of Different Types of Wiring</i>	<b>5</b>	<b>6</b>	-	-
<b>PC15.</b> diligently follow electrical safety procedures	-	1	-	-
<b>PC16.</b> identify and use the appropriate personal protective equipment including safety footwear, ear and eye protection	0.5	0.5	-	-
<b>PC17.</b> select, use, clean, maintain and store all tools and equipment safely	0.5	0.5	-	-
<b>PC18.</b> read, interpret and revise drawings and documentation including: layout and circuit drawings follow written instructions	1	1	-	-
<b>PC19.</b> plan installation work using drawings and documentation provided	0.5	0.5	-	-
<b>PC20.</b> ducting and wiring systems for commercial, domestic, residential, godown, agricultural and industrial use and when and where to use a specific ducting and/or wiring system	0.5	0.5	-	-
<b>PC21.</b> the range of electrical switchboards used for commercial, domestic, residential, agricultural and industrial uses and when and where to use a specific switchboard system including staircase wiring and master control wiring	0.5	0.5	-	-
<b>PC22.</b> types of electric lighting and heating systems for commercial, domestic residential and industrial use	0.5	0.5	-	-
<b>PC23.</b> understand different control devices and socket outlets used for commercial, domestic, residential, agricultural and industrial uses	0.5	0.5	-	-
<b>PC24.</b> install structured cabling systems including: computer network cabling, fire/burglar alarm), control and monitoring, access control closed circuit television.	0.5	0.5	-	-
<i>Industrial Wiring</i>	<b>1.5</b>	<b>1.5</b>	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC25.</b> plan installation work using drawings and documentation provided	-	-	-	-
<b>PC26.</b> trends and developments in the industry including new technology, standards and working methods.	0.5	0.5	-	-
<b>PC27.</b> range of materials and installation techniques to be used in different environments	-	-	-	-
<b>PC28.</b> different types of standards, drawings, installation descriptions and manuals	0.5	0.5	-	-
<b>PC29.</b> assemble different termination adaptors, including glands onto duct and attach ducts, of different types, securely onto a surface	-	-	-	-
<b>PC30.</b> able to use direct on line start (both power line and control) star delta stator	0.5	0.5	-	-
<i><b>Illumination Specification Application Of Different Elements Of Circuits</b></i>	<b>1</b>	<b>1</b>	-	-
<b>PC31.</b> different types of installations for fluorescent light metal halide high pressure mercury vapour high pressure sodium vapour led flame proof lighting fixtures	1	1	-	-
<i><b>Transformer Care and Maintenances</b></i>	<b>2</b>	<b>2</b>	-	-
<b>PC32.</b> select and install equipment as per drawings and documentation provided	1	1	-	-
<b>PC33.</b> understand the following elements parts of transformer working principle and construction types of transformer and its use (single phase & poly phase) spatial transformer (auto, ct, pt) construction and its application maintenance of transformer oil testing and filtration inspection of silica gel, breather, conservator, temperature maintenance of ht and lt transformers yards	1	1	-	-
<i><b>Motor</b></i>	<b>7</b>	<b>7</b>	-	-
<b>PC34.</b> connect a.c motor as per instructions provided to include: structured cabling systems as per manufacturers instructions and current industrial standards and regulations	1.5	1.5	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC35.</b> understand the working a.c motor and its construction	1.5	1.5	-	-
<b>PC36.</b> how the classification of a.c motor (synchronous and asynchronous) is done	1	1	-	-
<b>PC37.</b> the working and type of single phase motor and its working and poly phase (3 phase) and its working	0.5	0.5	-	-
<b>PC38.</b> set-up equipment to speed control and torque control of ac motor	0.5	0.5	-	-
<b>PC39.</b> advantage of ac drive system	0.5	0.5	-	-
<b>PC40.</b> ability for assembling and replacing of bearing with proper equipments, referring to the standard catalogue.	1	1	-	-
<b>PC41.</b> troubleshoot and take general care maintenance of ac motor	0.5	0.5	-	-
<b>D.C Motor</b>	<b>1.5</b>	<b>1.5</b>	-	-
<b>PC42.</b> different types of dc motors and the following details motor construction and working type of dc motor torque equation of dc motor characteristics of dc motor application of dc motor speed control of dc motor dc drive system general care maintenance of dc motor	0.5	0.5	-	-
<b>PC43.</b> the importance of special electrical motor in relation to petro chemical industry universal motor servo motor stepper motor brush less a.c motor and brush less d.c motor flame proof motors, specification, application, care & maintenance	1	1	-	-
<b>Generator</b>	<b>3</b>	<b>3</b>	-	-
<b>PC44.</b> install the required electrical supply systems including transformers, generators, circuit breakers, isolators, bus bars, measuring equipment for voltage, current, power, energy, frequency, rpm, wiring, fuses, earthing, switchboard, control panels, relays etc. as per the required specifications.	1	1	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC45.</b> conduct a test process to ensure the performance of installed electrical equipment as per the defined specifications	1	1	-	-
<b>PC46.</b> understand the different elements of generator as below: construction and working of generator characteristics of generator type of dc generator emf equation application of dc generator maintenance with abc type alternator construction & characteristics types, application & maintenance of alternator diesel generator care & maintenance basics of engine basics of fuel system, basics of air system, basics of lubrication system, basics of cooling system dg control panel. general maintenance	1	1	-	-
<i>Study of Single Line Diagram of Electrical Wiring System</i>	4	4	-	-
<b>PC47.</b> pc47. read, interpret and study drawings and documentation including: layout and circuit drawings follow written instructions	1	1	-	-
<b>PC48.</b> plan installation work using drawings and documentation provided	1.5	1.5	-	-
<b>PC49.</b> understand and read the symbol of electrical parts	0.5	0.5	-	-
<b>PC50.</b> ability to connect and track of electrical diagram	0.5	0.5	-	-
<b>PC51.</b> able to properly layout structure of substation and work instruction	0.5	0.5	-	-
<i>Circuit Breaker/ Switch Gear Care and Maintenance</i>	4	4	-	-
<b>PC52.</b> install electrical switchboards onto a surface in a secure way and assemble switchboard apparatus in a switchboard as per layout drawings	0.5	0.5	-	-
<b>PC53.</b> test installations before energizing and check for proper connection	0.5	0.5	-	-
<b>PC54.</b> test installations when energized by checking complete function on all equipment and installed to ensure correct operation of new installation as per instructions	1	1	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC55.</b> understand the working of the following elements definition and use of circuit breaker type of switch spst, spdt, dpst, dpdt, toggle switch, pushbutton switch, level actuator, limit switch, selector switch, flame proof switch types of circuit breaker	2	2	-	-
<b>Cable and Cable Joints</b>	<b>5.5</b>	<b>5.5</b>	-	-
<b>PC56.</b> identify cable types and sizes types of cables, specification current rating, application	1	1	-	-
<b>PC57.</b> identify sub-circuits and determine cable for connection of security control panel.	0.5	0.5	-	-
<b>PC58.</b> install and terminate cable to connect security control panel to existing sub-circuit.	0.5	0.5	-	-
<b>PC59.</b> knowledge of flame proof cables specification, application, care & maintenance.	1	1	-	-
<b>PC60.</b> inspect, test, rectify abnormal conditions, and commission connection of circuit.	0.5	0.5	-	-
<b>PC61.</b> the ability to different joints in the cable straight through, long routes and repaired section branch y joints for branch of a sector t- joint for branching of a sector transition joints special joint between two different types of cable	1.5	1.5	-	-
<b>PC62.</b> troubleshoot electrical installations and identify faults in cable	0.5	0.5	-	-
<b>Earthing System</b>	<b>3.5</b>	<b>3.5</b>	-	-
<b>PC63.</b> understand earth attachment positions on conductors, plant and equipment and the local earth are described in terms of earthing terminals, tail clamp attachment points, clamp rating and compatibility.	1.5	1.5	-	-
<b>PC64.</b> check earthing in terms of portable earths, voltage rating, fault level, and conductor rating.	0.5	0.5	-	-
<b>PC65.</b> ability to do earthing compliance requirements are described in terms of acceptable surface condition and cleanliness; and clamps, leads, fittings, sticks and poles, and terminations.	0.5	0.5	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC66.</b> understand the importance of importance of earthing in electrical and hazard system types of earthing system desired value measurement of earth resistance earthing in transformer earthing in substation	1	1	-	-
<i>Power System and Measurement</i>	2	2	-	-
<b>PC67.</b> explain the type and working of different stand by power systems like basics of ups, online and offline basics of inverter and its controls basics of cells and battery and rating care and maintenance of battery banks and its controls	1	1	-	-
<b>PC68.</b> ability to use different measuring instruments and their calibration digital multimeter and adaptor power meter phase sequence meter clamp on multi meter continuity tester ground fault tester insulation tester (meger) versatile data logger	1	1	-	-
<b>NOS Total</b>	<b>51</b>	<b>49</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	HYC/N6102
<b>NOS Name</b>	Industrial Electrical wiring
<b>Sector</b>	Hydrocarbon
<b>Sub-Sector</b>	Downstream
<b>Occupation</b>	Refinery Operations
<b>NSQF Level</b>	4
<b>Credits</b>	7
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	17/11/2025
<b>NSQC Clearance Date</b>	17/11/2022

## Qualification Pack

### DGT/VSQ/N0102: Employability Skills (60 Hours)

#### Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

#### Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

#### Elements and Performance Criteria

##### *Introduction to Employability Skills*

To be competent, the user/individual on the job must be able to:

**PC1.** identify employability skills required for jobs in various industries

**PC2.** identify and explore learning and employability portals

##### *Constitutional values - Citizenship*

To be competent, the user/individual on the job must be able to:

**PC3.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

**PC4.** follow environmentally sustainable practices

##### *Becoming a Professional in the 21st Century*

To be competent, the user/individual on the job must be able to:

**PC5.** recognize the significance of 21st Century Skills for employment

**PC6.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

##### *Basic English Skills*

To be competent, the user/individual on the job must be able to:

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- PC7.** use basic English for everyday conversation in different contexts, in person and over the telephone
- PC8.** read and understand routine information, notes, instructions, mails, letters etc. written in English
- PC9.** write short messages, notes, letters, e-mails etc. in English

### *Career Development & Goal Setting*

To be competent, the user/individual on the job must be able to:

- PC10.** understand the difference between job and career
- PC11.** prepare a career development plan with short- and long-term goals, based on aptitude

### *Communication Skills*

To be competent, the user/individual on the job must be able to:

- PC12.** follow verbal and non-verbal communication etiquette and active listening techniques in various settings
- PC13.** work collaboratively with others in a team

### *Diversity & Inclusion*

To be competent, the user/individual on the job must be able to:

- PC14.** communicate and behave appropriately with all genders and PwD
- PC15.** escalate any issues related to sexual harassment at workplace according to POSH Act

### *Financial and Legal Literacy*

To be competent, the user/individual on the job must be able to:

- PC16.** select financial institutions, products and services as per requirement
- PC17.** carry out offline and online financial transactions, safely and securely
- PC18.** identify common components of salary and compute income, expenses, taxes, investments etc
- PC19.** identify relevant rights and laws and use legal aids to fight against legal exploitation

### *Essential Digital Skills*

To be competent, the user/individual on the job must be able to:

- PC20.** operate digital devices and carry out basic internet operations securely and safely
- PC21.** use e-mail and social media platforms and virtual collaboration tools to work effectively
- PC22.** use basic features of word processor, spreadsheets, and presentations

### *Entrepreneurship*

To be competent, the user/individual on the job must be able to:

- PC23.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research
- PC24.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion
- PC25.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

### *Customer Service*

To be competent, the user/individual on the job must be able to:

- PC26.** identify different types of customers
- PC27.** identify and respond to customer requests and needs in a professional manner.

## Qualification Pack

**PC28.** follow appropriate hygiene and grooming standards

### *Getting ready for apprenticeship & Jobs*

To be competent, the user/individual on the job must be able to:

**PC29.** create a professional Curriculum vitae (Résumé)

**PC30.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

**PC31.** apply to identified job openings using offline /online methods as per requirement

**PC32.** answer questions politely, with clarity and confidence, during recruitment and selection

**PC33.** identify apprenticeship opportunities and register for it as per guidelines and requirements

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** need for employability skills and different learning and employability related portals

**KU2.** various constitutional and personal values

**KU3.** different environmentally sustainable practices and their importance

**KU4.** Twenty first (21st) century skills and their importance

**KU5.** how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

**KU6.** importance of career development and setting long- and short-term goals

**KU7.** about effective communication

**KU8.** POSH Act

**KU9.** Gender sensitivity and inclusivity

**KU10.** different types of financial institutes, products, and services

**KU11.** how to compute income and expenditure

**KU12.** importance of maintaining safety and security in offline and online financial transactions

**KU13.** different legal rights and laws

**KU14.** different types of digital devices and the procedure to operate them safely and securely

**KU15.** how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

**KU16.** how to identify business opportunities

**KU17.** types and needs of customers

**KU18.** how to apply for a job and prepare for an interview

**KU19.** apprenticeship scheme and the process of registering on apprenticeship portal

## Generic Skills (GS)

User/individual on the job needs to know how to:

**GS1.** read and write different types of documents/instructions/correspondence

**GS2.** communicate effectively using appropriate language in formal and informal settings

## Qualification Pack

- GS3.** behave politely and appropriately with all
- GS4.** how to work in a virtual mode
- GS5.** perform calculations efficiently
- GS6.** solve problems effectively
- GS7.** pay attention to details
- GS8.** manage time efficiently
- GS9.** maintain hygiene and sanitization to avoid infection

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	<b>1</b>	<b>1</b>	-	-
<b>PC1.</b> identify employability skills required for jobs in various industries	-	-	-	-
<b>PC2.</b> identify and explore learning and employability portals	-	-	-	-
<i>Constitutional values - Citizenship</i>	<b>1</b>	<b>1</b>	-	-
<b>PC3.</b> recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
<b>PC4.</b> follow environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	<b>2</b>	<b>4</b>	-	-
<b>PC5.</b> recognize the significance of 21st Century Skills for employment	-	-	-	-
<b>PC6.</b> practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
<i>Basic English Skills</i>	<b>2</b>	<b>3</b>	-	-
<b>PC7.</b> use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
<b>PC8.</b> read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
<b>PC9.</b> write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development &amp; Goal Setting</i>	<b>1</b>	<b>2</b>	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC10.</b> understand the difference between job and career	-	-	-	-
<b>PC11.</b> prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	<b>2</b>	<b>2</b>	-	-
<b>PC12.</b> follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
<b>PC13.</b> work collaboratively with others in a team	-	-	-	-
<i>Diversity &amp; Inclusion</i>	<b>1</b>	<b>2</b>	-	-
<b>PC14.</b> communicate and behave appropriately with all genders and PwD	-	-	-	-
<b>PC15.</b> escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	<b>2</b>	<b>3</b>	-	-
<b>PC16.</b> select financial institutions, products and services as per requirement	-	-	-	-
<b>PC17.</b> carry out offline and online financial transactions, safely and securely	-	-	-	-
<b>PC18.</b> identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
<b>PC19.</b> identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	<b>3</b>	<b>4</b>	-	-
<b>PC20.</b> operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
<b>PC21.</b> use e-mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
<b>PC22.</b> use basic features of word processor, spreadsheets, and presentations	-	-	-	-

## Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Entrepreneurship</i>	<b>2</b>	<b>3</b>	-	-
<b>PC23.</b> identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
<b>PC24.</b> develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
<b>PC25.</b> identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	<b>1</b>	<b>2</b>	-	-
<b>PC26.</b> identify different types of customers	-	-	-	-
<b>PC27.</b> identify and respond to customer requests and needs in a professional manner.	-	-	-	-
<b>PC28.</b> follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship &amp; Jobs</i>	<b>2</b>	<b>3</b>	-	-
<b>PC29.</b> create a professional Curriculum vitae (Résumé)	-	-	-	-
<b>PC30.</b> search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
<b>PC31.</b> apply to identified job openings using offline /online methods as per requirement	-	-	-	-
<b>PC32.</b> answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
<b>PC33.</b> identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
<b>NOS Total</b>	<b>20</b>	<b>30</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	DGT/VSQ/N0102
<b>NOS Name</b>	Employability Skills (60 Hours)
<b>Sector</b>	Cross Sectoral
<b>Sub-Sector</b>	Professional Skills
<b>Occupation</b>	Employability
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	07/10/2025
<b>Next Review Date</b>	07/10/2028
<b>NSQC Clearance Date</b>	07/10/2025

## Qualification Pack

### HYC/N9301: Working Effectively in a team

#### Description

This unit is about working effectively within a team.

#### Scope

The scope covers the following :

- Effective team work

#### Elements and Performance Criteria

##### *Effective team work*

To be competent, the user/individual on the job must be able to:

- PC1.** maintain clear communication with colleagues
- PC2.** pass on information to colleagues in line with organisational requirements
- PC3.** provide support to the team members
- PC4.** respect the colleagues
- PC5.** fulfil commitments made to colleagues
- PC6.** inform team members timely, if timelines can't be met
- PC7.** take the necessary initiatives to resolve the issues while working in team
- PC8.** adopt gender neutral behaviour while interacting with colleagues
- PC9.** offer assistance to a person with disability (PWD), only if required

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the organization policies and procedures related to team performance
- KU2.** the importance of effective communication and establishing good working relationships with colleagues
- KU3.** the importance of creating an environment of trust and mutual respect
- KU4.** the implications of own work on the work and schedule of others
- KU5.** the standard practices in organisation w.r.t communication at various levels
- KU6.** the personal responsibility for completing the task in time
- KU7.** importance of gender equality
- KU8.** importance of showing empathy while interacting with a PwD

#### Generic Skills (GS)

User/individual on the job needs to know how to:

## Qualification Pack

- GS1.** communicate effectively in writing
- GS2.** read instructions, guidelines/procedures
- GS3.** work in a disciplined manner for meeting commitments and deadline
- GS4.** how to plan and prioritise the work
- GS5.** the importance of consistent and reliable services
- GS6.** apply problem solving approaches in different situations
- GS7.** apply balanced judgments to different situations

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Effective team work</i>	<b>20</b>	<b>30</b>	-	-
<b>PC1.</b> maintain clear communication with colleagues	2	3	-	-
<b>PC2.</b> pass on information to colleagues in line with organisational requirements	2	3	-	-
<b>PC3.</b> provide support to the team members	2	4	-	-
<b>PC4.</b> respect the colleagues	3	4	-	-
<b>PC5.</b> fulfil commitments made to colleagues	2	3	-	-
<b>PC6.</b> inform team members timely, if timelines can't be met	2	4	-	-
<b>PC7.</b> take the necessary initiatives to resolve the issues while working in team	3	4	-	-
<b>PC8.</b> adopt gender neutral behaviour while interacting with colleagues	2	2	-	-
<b>PC9.</b> offer assistance to a person with disability (PWD), only if required	2	3	-	-
<b>NOS Total</b>	<b>20</b>	<b>30</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	HYC/N9301
<b>NOS Name</b>	Working Effectively in a team
<b>Sector</b>	Hydrocarbon
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic, Generic
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	3.0
<b>Last Reviewed Date</b>	18/02/2025
<b>Next Review Date</b>	18/02/2028
<b>NSQC Clearance Date</b>	18/02/2025

## Qualification Pack

### HYC/N9302: Maintain health, safety and security procedures

#### Description

This unit is about maintaining health, safety and security procedure at workplace. It covers responsibilities towards self, others, assets and the environment.

#### Scope

The scope covers the following :

- Follow health and safety measures
- Follow safety procedures during emergency

#### Elements and Performance Criteria

##### *Follow health and safety measures*

To be competent, the user/individual on the job must be able to:

**PC1.** use protective clothing/equipment such as face mask, hand gloves, goggle etc for specific tasks and work conditions

**PC2.** identify the people responsible for maintaining health and safety in the workplace

**PC3.** identify possible causes of risk or accident in the workplace

**PC4.** follow safe working practices while dealing with hazards to ensure the safety of self and others

**PC5.** lift heavy objects safely using correct procedures

**PC6.** follow safety signages

**PC7.** maintain hands hygiene by washing hand frequently and thoroughly with soap and water or alcohol-based hand rub

**PC8.** inform the concerned person of any illness related to self and others

**PC9.** maintain workplace hygiene by disinfecting the equipment and tools regularly

##### *Follow safety procedures during emergency*

To be competent, the user/individual on the job must be able to:

**PC10.** respond promptly and appropriately to an accident or in an emergency situation

**PC11.** use appropriate fire extinguishers for different types of fires correctly

**PC12.** follow appropriate rescue techniques during fire hazard

**PC13.** follow good housekeeping practice in order to prevent fire hazards

**PC14.** inform fire safety department about any near-miss incidents in the work place

**PC15.** provide appropriate first aid to victims in an emergency situation

**PC16.** follow the applicable regulations and codes as per safety standard

**PC17.** prepare written accident/incident report and share with the concerned officer/department

#### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

## Qualification Pack

- KU1.** company's policies on personnel management and duty reporting procedure
- KU2.** reporting structure within organization
- KU3.** health and safety hazards commonly affecting the work environment and related precautions
- KU4.** importance of maintaining personal hygiene using PPE kit, sanitizer and soap
- KU5.** importance of maintaining workplace hygiene
- KU6.** preventative and remedial actions to be taken in the case of exposure to toxic materials
- KU7.** importance of using protective clothing/equipment while working
- KU8.** various causes of fire
- KU9.** techniques of using different types of fire extinguishers
- KU10.** different materials used for extinguishing fire
- KU11.** various types of safety signs and their significance

### Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** communicate effectively by writing
- GS2.** read instructions, guidelines/procedures and reports
- GS3.** identify and report potential sources of danger
- GS4.** how to plan the work to meet the deadline
- GS5.** the importance of on time services
- GS6.** apply problem solving approaches in different situations
- GS7.** apply balanced judgments in different situations

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Follow health and safety measures</i>	<b>9</b>	<b>15</b>	-	-
<b>PC1.</b> use protective clothing/equipment such as face mask, hand gloves, goggle etc for specific tasks and work conditions	1	2	-	-
<b>PC2.</b> identify the people responsible for maintaining health and safety in the workplace	1	-	-	-
<b>PC3.</b> identify possible causes of risk or accident in the workplace	1	2	-	-
<b>PC4.</b> follow safe working practices while dealing with hazards to ensure the safety of self and others	1	2	-	-
<b>PC5.</b> lift heavy objects safely using correct procedures	1	2	-	-
<b>PC6.</b> follow safety signages	1	2	-	-
<b>PC7.</b> maintain hands hygiene by washing hand frequently and thoroughly with soap and water or alcohol-based hand rub	1	2	-	-
<b>PC8.</b> inform the concerned person of any illness related to self and others	1	1	-	-
<b>PC9.</b> maintain workplace hygiene by disinfecting the equipment and tools regularly	1	2	-	-
<i>Follow safety procedures during emergency</i>	<b>11</b>	<b>15</b>	-	-
<b>PC10.</b> respond promptly and appropriately to an accident or in an emergency situation	1	2	-	-
<b>PC11.</b> use appropriate fire extinguishers for different types of fires correctly	2	2	-	-
<b>PC12.</b> follow appropriate rescue techniques during fire hazard	1	2	-	-
<b>PC13.</b> follow good housekeeping practice in order to prevent fire hazards	1	1	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC14.</b> inform fire safety department about any near-miss incidents in the work place	2	2	-	-
<b>PC15.</b> provide appropriate first aid to victims in an emergency situation	1	2	-	-
<b>PC16.</b> follow the applicable regulations and codes as per safety standard	1	2	-	-
<b>PC17.</b> prepare written accident/incident report and share with the concerned officer/department	2	2	-	-
<b>NOS Total</b>	<b>20</b>	<b>30</b>	-	-

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	HYC/N9302
<b>NOS Name</b>	Maintain health, safety and security procedures
<b>Sector</b>	Hydrocarbon
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic, Generic
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	3.0
<b>Last Reviewed Date</b>	18/02/2025
<b>Next Review Date</b>	18/02/2028
<b>NSQC Clearance Date</b>	18/02/2025

### Assessment Guidelines and Assessment Weightage

#### Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

## Qualification Pack

**Minimum Aggregate Passing % at QP Level : 70**

(**Please note:** Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

### Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
HYC/N6101.Job requirements and related processes	23	22	0	0	45	25
HYC/N6102.Industrial Electrical wiring	51	49	0	0	100	25
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	0	0	50	20
HYC/N9301.Working Effectively in a team	20	30	-	-	50	15
HYC/N9302.Maintain health, safety and security procedures	20	30	-	-	50	15
<b>Total</b>	<b>134</b>	<b>161</b>	<b>0</b>	<b>0</b>	<b>295</b>	<b>100</b>

## Qualification Pack

### Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training
<b>SS</b>	Stainless Steel
<b>PPE</b>	Personal Protective Equipment
<b>SS</b>	Stainless Steel
<b>PPE</b>	Personal Protective Equipment

## Qualification Pack

### Glossary

<b>Sector</b>	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
<b>Scope</b>	Scope is a 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 quality of performance required.

## Qualification Pack

<b>Knowledge and Understanding (KU)</b>	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
<b>Organisational Context</b>	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
<b>Electives</b>	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
<b>Options</b>	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.