NSQF QUALIFICATION FILE GUIDANCE

Version 6: Draft of 08 March 2016

NSDA Reference
To be added by NSDA

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Name and address of submitting body:

Directorate General of Training (DGT),
Ministry of Skill Development & Entrepreneurship (MoSDE)
Shram Shakti Bhawan, Rafi Marg,
New Delhi

Name and contact details of individual dealing with the submission

Name: Sh. Dinesh Nijhawan
Position in the organisation: Director (CFI)
Address if different from above
Tel number(s) 011-23708071
E-mail address: dinesh_nij@hotmail.com

List of documents submitted in support of the Qualifications File

1. Qualification document- Computer Hardware Assistant
2. Curriculum for Computer Hardware Assistant under Information and Communication Technology Sector for Modular Employable Scheme (MES)
3. Executive Summary of Human Resource and Skill Requirements in IT & ITes by NSDC
4. List of number of trainees of trained under MES in 2015-16 & 2016-17.
5. List of candidates' placed for this course in 2016.

SUMMARY

Qualification Title	Computer Hardware Assistant
Qualification Code	ICT 703
Nature and purpose of the qualification	Nature of the Qualification is Certificate in job role Computer Hardware Assistant The purpose of the qualification is to support and maintain computer systems, desktops, and peripherals. This includes installing, diagnosing, repairing, maintaining, and upgrading all hardware and equipment while ensuring optimal workstation performance. The person will also troubleshoot problem areas in a timely and accurate fashion, and provide end user training and assistance where required.
Body/bodies which will award the qualification	National Council for Vocational Training (NCVT)
Body which will accredit providers to offer courses leading to the qualification	GOI Ministries and State departments who have adopted MES qualifications accredit training providers for their programs and schemes (only in case of SDIS schemes Training providers accredited by States on behalf of NCVT)
Body/bodies which will carry out assessment of learners	Independent Agency empanelled as Assessing Bodies (ABs)
Occupation(s) to which the qualification gives access	After completion of the course the trainees shall be qualified for one or more of the following job roles: • Computer hardware technician • Hardware Maintenance executive • Computer Hardware Assistant • Technical support staff • IT End user support
Licensing requirements	-NA-
Level of the qualification in the NSQF	Level 3
Anticipated volume of training/learning required to complete the qualification	500 Hours
Entry requirements and/or recommendations	Passed 10th class examination
Progression from the qualification	An individual can progress in an organisation as an IT Maintenance Executive. Can start his/her own Business Unit of Computer and its peripherals repair and sales.
Planned arrangements for the Recognition of Prior learning (RPL)	RPL arrangements are not planned under this qualification.
International	-NA-

comparability where known	
Date of planned review of the qualification.	2 years after approval of the Qualification

Formal structure of the qualification

Title of component and identification code.	**Mandatory/ Optional**	**Estimated size (learning hours)**	**Level**
(i) DGT/MES/ICT/N08: Get Familiarized with the Safety Methods and Precautions	M	10	3
(ii) DGT/MES/ICT/N09: Understand the Basic concept of Electricity, Resistors, Inductance, Capacitance, Soldering & De-Soldering	M	70	3
(iii) DGT/MES/ICT/N10: Understand the Basic concept of Electronic Components and Digital Electronics.	M	70	3
(iv) DGT/MES/ICT/N11: Acquire knowledge of Safety and Precaution in Desktop repair and Storage of parts	M	10	3
(v) DGT/MES/ICT/N12: To have Knowledge of Computer Hardware, their installation and Troubleshooting	M	200	3
(vi) DGT/MES/ICT/N13: To have Knowledge of Installation of Windows OS, Softwares, Antivirus, Drivers and Utility Installations and removal	M	140	3
Total		**500**	

Please attach any document giving further detail about the structure of the qualification – eg a Curriculum Document or a Qualification Pack.

Curriculum for Computer Hardware Assistant under Information and Communication Technology Sector for Modular Employable Scheme (MES) attached as annexure.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

SECTION 1
ASSESSMENT

Body/Bodies which will carry out assessment:

DGT empanelled Assessing Bodies (ABs)

How will RPL assessment be managed and who will carry it out?

RPL arrangements are not planned under this qualification.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.

Criteria for selection of Assessment body

Minimum Eligibility Criteria

- The applicant shall be a legal entity, registered in India.
- The applicant should have in last two years carried out competency / skill assessment for minimum 1000 persons or should have trained minimum 1000 persons and got tested by some agencies such as NCVT, Sector Skill Council, State, board/ council and reputed industry Association. Organizations having experience in testing of competencies would be preferred.
- In case more number of applications is received, preference will be given to those organizations that have trained/assessed larger number of persons.
- The applicant is not a Training Provider (TP) in the same sector and in same State, but it can be TP in other States, other Sectors or other scheme.
- The applicant shall have access to technically qualified personnel of repute and integrity in different industrial trades and technology.
- The applicant shall develop dedicated human resource for handling the processes in assessment process.
- The applicant shall declare its linkages with other organization(s), if any to ensure independence and avoid any conflict of interest.
- Institutions/ Firms blacklisted by any Government Department shall not be considered in this RFP.
- The Applicant shall provide the information and supporting documents towards their claims.
- Initially provisional empanelment will be awarded to the organizations based on the evaluation of eligibility of the Assessing Body based on the criteria.
- Based on the module and sector that will be handled by the assessor, the assessing body shall send its assessor for competency evaluation in the institutions which will be notified by DGT time to time. The assessor will be assessed to ascertain the competency to carry out competency based assessment.
- Final empanelment would be granted subject to the Assessing Body fulfilling the following conditions of getting the competencies of 2 assessors of each module per State evaluated in the institutes notified by the DGT. Testing charges for evaluating the competencies of the assessors will be borne by the Assessing Bodies.

(1) Assessment process:

The assessment process aims to test and certify the competency of the persons through Assessing Bodies who seek certification of their skills acquired informally or the persons who have been trained at the registered TPs. The competency assessment of the candidate is being done by the Assessor Competency Evaluation (ACE) qualified assessor of the independent Assessing Bodies (AB) which is not involved in training delivery, to ensure an impartial assessment. ACE is conducted to evaluate the competency of the assessor. In the assessment process, identification of competency, ways to measure the competency and deciding on the type of evidence that has to be collected are the responsibility of the Assessing bodies whereas administering the assessment and collecting the evidence and reporting the results are the responsibility of the assessors. The assessment process consists of following components:

Theory Test:

- It must assess the knowledge which is essential for a person to do the job. Without this knowledge, the person will not be able to do the job.
- The questions shall be of objective type involving selection of correct response.
- The question paper should contain sketches/ diagrams/ photographs/ drawing to overcome the problems of reading comprehension.
- The test shall be of short duration.

Practical Test:

It shall be able to test:

- Manipulative skills to handle tools and equipment.
- Speed in doing work.
- Accuracy maintained
- Quality in workmanship.
- Sequence of performance.
- Economical use of material.
- Neatness & housekeeping.
- All the competencies prescribed in the course curriculum.

The Assessment Parameters adopted during assessment:

- Knowledge of equipment, limitation of use of tools and equipment, and methods & procedure.
- Understanding of functioning of equipment & tool, criteria to be used in selecting tools for given job, and the process of measurement.
- Skill in finishing to required measurement, handling measurement & calculations, handling tools and equipment with ease, finishing neatly.
- Abilities to take corrective steps, use correct work habits, take measurements, complete the job within stipulated time, and adopt safe practices.
- Attitude towards the work, accurate & precise work and co-workers and supervisor.

(2) Duration of Test:

The duration of test vary according to the task. Theory test shall be of 1 hour duration and practical test for engineering trade shall be 6 to 8 hours minimum and non-engineering it shall be of 4 hours minimum. Assessing Bodies while preparing practical test shall ensure that candidate shall be tested on all the competencies prescribed in the course module.

The marking pattern and distribution of marks for the qualification are as under:

Terminal competency	Maximum marks
Application of knowledge	30
Care for tools & equipment	15
Economic use of materials	15
Safety consciousness	10
Speed	10
Accuracy	15
Quality of workmanship	20
Amount of work	15
No. of attempts	10
Attitude	10
Total maximum marks for Practical	150
Maximum marks for theory	50

(3) **Minimum pass mark:**

Minimum passing marks for Practical is 60%

Minimum pass marks for theory is 40%

(4) Testing and certifications process for the course:

Pre- Assessment

- Regional Directorate of Apprenticeship Training (RDAT) allot batches to the Assessing Bodies on rotational basis depending on the presence of assessing body in that region sector wise and the assessing

body in coordination with Training Provider and assessor should confirm and schedule the assessment.

- The Assessing Body confirms the date of assessment in consultation with Training Provider and communicate to the RDAT/State.
- The Assessing Body forms a panel of ACE qualified assessors of high repute and integrity, sector wise and location wise.
- The assessment of the candidates is done by the Assessing Bodies in designated Testing Centre (TC). The Testing Centre where the assessment is carried out and Testing Centre can be Training Center also. The Assessing Body select the TC based on the location, accessibility and the infrastructure facilities available for conducting the test.
- The testing center is approved by the RDAT incase of courses run by DGT,MSDE. Incase where the courses are run by the Sate Govt., TC is approved by State Govt.. Training conducted by other dept. at their accredited Training Centre, same training centre is designated as Testing centre.
- The Assessing Body provide details of selected TC along with skill areas in which assessment can be done at the TC, to the RDAT and respective States/UTs.
- The Assessing Bodies depute ACE qualified assessors for assessments whose details are furnished by Assessing Bodies to DGT in advance.
- Assessing Body has to communicate to the Testing Centre following:
  -Details of the candidates to appear for assessment in various MES courses.
  -Details of Assessors selected with their contact details.
  -Requirement of infrastructure, raw material etc.
  -Testing charges to be reimbursed to Testing Centre

Preparation of assessment tools and prerequisites:

- The assessment tools contain components for testing the knowledge, application of knowledge and demonstration of skill. The knowledge test is objective paper based test or short structured questions based. The application of knowledge is verified based on questioning or seeking response for a case. Demonstration of skill is verified based on practical demonstration by the candidate.
- The type of assessment tools to be used for assessment are to be prepared in advance by the assessing body in accordance to the guidelines as prescribed below:
  - Define the performance objective – This is based on the course objectives and competency in workplace as prescribed by MES curriculum. The written tests and practical tests assess all the competencies mentioned in course curriculum.
  - In case of practical test, the operations which are to be observed in case of process test (how a particular task is being carried out) are clearly mentioned and the specifications of the final product in case of product test (the task in itself).
  - List of tools, infrastructure, and equipment to carry out the assessment are prepared based on the test instruments that are planned to be used.
  - Written directions are given to the candidates before the task is attempted.
  - Scoring system, observations and rating is prepared for each competency which is going to be assessed.

Pre-assessment activities for Assessor at the Testing Centre

- Verification of student credentials: The assessor check the application form submitted by the candidates and verify the photo pasted on the forms with candidates who are taking assessment in accordance with checklist
- Verification of testing centre for adequate infrastructure, tools and equipment: The assessor verifies the availability of infrastructure, tools and equipment for carrying out both theory and practical assessments. The minimum requirement prescribed under the MES modules is used as benchmark.
- Attendance verification: The assessor checks the attendance register of candidates and instructors until the time biometric attendance system is put in place. Once the biometric attendance system is in place, the biometric attendance of assessors along with that of trainees/candidates has to be captured during the assessment at the start as well as end of theory and practical test.
- Attendance during assessment: The assessor takes the attendance of all the students who appear for assessment after the successful verification of the student credentials and before the start of the assessment. The assessor also provides his/her attendance during start and end of the practical and theory test.
- Verification of the documents related test carried out by Training Provider/ Testing Centre (TC) for candidates who were not able to produce document in support of having passed the qualification.

Assessment activities

- Before the start of assessment, read out the instructions to the students.

- The written test & practical test is for fixed duration as prescribed.
- It is ensured that individual attention is given to all the candidates during the practical test.
- The assessor takes photographs during the assessment process of all the students in the testing centre, the students during theory and practical tests, practical lab/workshop showing the equipment to be used for assessment, the assessor along with the students appearing for the assessment.

Post-assessment activities

- The assessor consolidates all the theory and practical test papers and ensures that all the mandatory information is filled. The total score for each student should be calculated and recorded in result sheet.
- The assessor send the attendance sheet, result sheet, answer papers by courier/post to the assessing body immediately after the completion of assessment
- Uploading outcome of the assessment and photos in portal by assessing body
- Assessing body upload the results within one week of the assessment date.
- Photos taken by the assessors during assessment are sent to respective RDATs through e-mail only. Non dispatch of photos of assessment to RDAT makes assessment void. Re-assessment of such batch is done by the Assessing Bodies on their own expenses.
- Details of assessors are emailed to RDAT at the time of uploading the outcome of the assessment. Outcome of the assessment is not accepted in case details of assessors are not emailed to respective RDAT.
- Maintaining assessment records
- Publishing of results and Certificate issue
- RDAT verifies the outcome of the assessment, details of assessors, photos and print and sign the certificates for successful candidates and send it to the respective candidates. In case of direct candidate's assessment, the Certificates are sent to the Assessing Body.
- Certificates which will be issued carry photograph of the trainee, name of Training Provider, start date & end date of training and duration of training once the systems for the same are put in place.
- The certificate is issues under the aegis of NCVT. All the communications are done through portal.

ASSESSMENT EVIDENCE

Complete a grid for each component as listed in "Formal structure of the the qualification" in the Summary.

NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – ie Learning Outcomes to be assessed, assessment criteria and the means of assessment.

Title of Component: Computer Hardware Assistant

Outcomes to be assessed		**Means of Assessment**
Learning Outcome	**Assessment criteria**	
DGT/MES/ICT/N08: Get Familiarized with the Safety Methods and Precautions	AO1. Demonstrate the perform safety precaution, first aid practice, artificial respiration, electrical safety precautions.	Practical Test
	AO2. Demonstrate the knowledge of Safety in moving and shifting heavy and delicate equipments	Practical Test
DGT/MES/ICT/N09: Understand the Basic concept of Electricity, Resistors, Inductance, Capacitance, Soldering & De-Soldering	AO1. Explain the Concept of current and voltage. AC, DC Supply indicating lamps. Different types of Fuses and their applications. Different types of connectors used in electrical and electronic applications. Different types of switches used in electrical and electronic applications. Measuring instruments, MC, MI type, Ammeter, Voltmeter, Multimeter for measuring voltage and current. Construction, characteristics/ features and specification. Digital Multimeter Meaning of resistance, continuity and continuity testers. Multimeter for checking continuity. Concept of Power and measurement using V&I meter and Power meter.	Theory Test
	AO2. Demonstrate the identify specification of types of fuses, type of switches, meter types and measuring range. Will able to Measure voltage and current using Multi-meter (analog-digital), DC and AC power using V-I method and using power meter.	Practical Test
	AO3. Explain the knowledge of Classification, characteristics and application of different types of resistors.- carbon film, metal film, wire wound, cermets and surface mounted. Colour coding of resistors. Calculating resistance value and its tolerance value. Wattage of resistors, specific resistance and their importance. Resistors in series and parallel. Ohms law and Kirchhoff's Laws. Printed circuit boards and its application. Temperature dependent resistors and their applications.(PTC and NTC). Voltage dependent resistors (VDR). Photoelectric effect, Light Dependent resistors. Variable resistors, pots, presets, types and application. Log and Linear resistors	Theory Test
	AO4. Demonstrate the Identify different types of resistors from physical appearance, resistor value and tolerance using colour code. Will able to measuring resistance using Multimeter, Will able to perform Experiment using P.T.C and NTC resistors. Experiment to check VDR's Experiment to check LDR's, Test Pots, & Presets.	Practical Test

	AO5. Explain the knowledge of inductance, Properties. Types of inductors and their application. Inductive reactance, measuring inductance and inductive reactance. Meaning of lead, lag. Effect of inductor on power factor. Frequency dependence of inductive reactance. Self and Mutual inductance. Coefficient of coupling. Transformers. Turns ratio, Transformer winding, Winding machines, Transformer losses and efficiency, efficiency type of cores and uses for LF, HF, VHF transformer, Transformers used in high frequency applications.	Theory Test
	AO6. Demonstrate the Identify different types of inductors and its specifications. Measure inductance using LCR meter. Can Calculate inductive reactance at different input signal frequencies. Check step down transformers. Rewind a transformer to given specification using winging machine. Able to Find losses and efficiency of given transformers, Identify and test high frequency transformers used in electronic circuits.	Practical Test
	AO7. Explain the Working principle of capacitors. Electrostatic action, dielectric constant. Unit of capacitance and capacitive reactance. Types of Capacitors-electrolytic, ceramic, polyester, tantalum, mica, surface mounted. Colour coding, and tolerance. Measuring capacitance and capacitive reactance. Behaviour of capacitance at different frequencies. Capacitors in series and parallel. Meaning of Resonance. Application of resonance. Seriesand parallel resonance circuits	Theory Test
	AO8. Identify and test high frequency transformers used in electronic circuits, different types of capacitors from colour code and typographic code. Test working condition of capacitor. Measure capacitance using RLC meter, capacitive reactance at different frequencies, capacitance and capacitive reactance of capacitors in series and capacitors in parallel and the resonance frequency of a given Series and parallel resonance circuit.	Practical Test
	AO9. Explain the Soft soldering and precautions to be taken for making a good solder joint. Types of solder and need of soldering paste. De-soldering	Theory Test

	tools	
	AO10. Demonstrate Soldering and de-soldering techniques, using hook-up wires. Soldering different components on Tag Board.	Practical Test
DGT/MES/ICT/N10: Understand the Basic concept of Electronic Components and Digital Electronics.	AO1. Explain the basic of Semiconductor, intrinsic and extrinsic semi conductors, P and N type semiconductor. Development of P.N. junction barrier potential. Effect of temperature. Breakdown voltage. Different types of Diodes. Diode terminals. Diode specifications using data book. Forward and reverse characteristics of diode. Testing diodes using Multimeter. Half wave and Full wave rectifiers using diodes. Calculate output DC, ripple factor. Bridge rectifier. Filters for rectifiers.. Zener diode-Its characteristics and application for voltage regulation. Calculating the series resistor for required current rating. Specifications of a regulated power supply and testing a power supply for its specifications.	Theory Test
	AO2. Explain the Working principle of PNP, Bipolar transistors. Types of transistors and applications. Leads of transistors and their identification. Forward and reverse bias of transistor Junction. General values of junction resistances. Quick testing a transistor-using Multimeter. Transistor configuration - CB, CE, CC, alpha, beta. Types of Biasing of transistor amplifiers, comparison and applications. Thermal runaway. Steady and Dynamic characteristics. Testing- get frequency response, gain bandwidth product, signal to noise ratio. Unregulated, regulated DC Power supply specifications. Application of different types of power supply for specific application types. Series regulator using transistor. Short circuit protection. Overload protection. Shunt regulators using transistors. Fixed Voltage regulators using IC's. Variable voltage regulators using IC's. Mains voltage stabilizers. Inverters and converters. Un-interrupted power supply, types and applications.	Theory Test
	AO3. Identify the following : Terminals of different types of diodes. Record its specifications referring to diode data sheet. Plot forward and reverse characteristics of diode Testing working condition of diodes.	Practical test

	Construct and test a half wave and full wave diode rectifiers. Construct and test a Bridge rectifier with and without filter. Construct a bridge rectifier with capacitance input filter. Draw Zener diode characteristics, Simple voltage regulator using zener diode. Identify types transistors based on their physical appearance. Identify the leads of the given assorted types of transistors. Quick test given transistors using Multimeter. Identify opens, shorted junctions. Wire and find the gain of amplifiers in - CB, CE, CC configurations. Practice on identifying and using the controls on a regulated power supply. Assemble and test a series regulated power supply. Assemble and test a shunt regulated power supply. Assemble and test a fixed voltage regulator using 3pin IC. Assemble and test a variable voltage regulator using IC. Assemble a simple inverter and converter for use with emergency lamp. Identify the parts and controls of a UPS. Practice switch-on and switch-off procedures.	
	AO4. Explain the basic of Number systems and conversions. Classification of digital IC's. Use of data book for identification of digital IC's. Basic LOGIC GATES and truth table. Boolean algebra. Logic families, logic levels, propagation delay. Multiple input gates. XOR, XNOR gates and application. Simplification of Boolean equations. Combinational logic circuits. Half adder, full adder, parallel binary adder, half subtractor, full subtractor. Commercially available adders/subtractors. Comparator, decoders, encoders, multiplexer, demultiplexer. Parity generators/checkers. RS Flip - Flop, JK flip-flop, Master- Slave flip-flops. Types of triggering and applications. D flip-flops. Counters, ripple, synchronous, up- down, scale-n counters. Principles of A/D & D/A converter. Commercially	Theory Test

	available A/D & D/A converters. Shift registers. Types, applications. Commercially available shift registers and applications. Conversion of serial data into parallel and vice-versa	
	AO5. Demonstrate the following : a) Identify the specifications of given digital IC's referring to data books. b) Verify the truth table of two input OR, NOR, AND, NAND, NOT gates.) Verify of truth table of multiple input logic gates. d) Verify the truth table of XOR and XNOR Gates. e) Realization of different gate type using NAND gates. f) verification of Boolean laws. g) Realization of half adder & full adder using NAND gates. Realization half subtractor and full subtractor using NAND gates. h) Verification of truth table of 7483- 4bit adder. i) Verifying encoder/ decoder/ multiplexer/ demultplexer IC truth tables. j) Realization and verification of truth table of RS, JK and MS- JK flip-flop. k) Realization and verification of D- flip flop. l) Realization and verficiation of up & down (sync/async) counter. m) Verification of A/D & D/A converter. n) Realization of shift registers using FF. o) Verification of Right-shift, Left- shift registers. p) Verification of Serial-in-parallel out and parallel in serial out of data	Practical Test
	AO6. Explain the basic of Other Mechanical, Electrical & Electronics Accessories like Working with Gears, Belts, Stepper Motor, Drive.Sensors, Relays, different advanced Intel microprocessor chips, different advanced microprocessor chips other than from Intel.	Theory Test
DGT/MES/ICT/N11: Acquire knowledge of Safety and Precaution in Desktop repair and Storage of parts	AO1. Explain the basic of : a) Basic blocks of a digital computer. Hand Tools Basics and Specifications. Types of cabinets, relation with mother board form factor. Precautions to be taken while opening and closing PC cabinet. b) Main devices, components, cards, boards inside a PC(to card or device level only). c) Types and specifications of the cables and connectors used for interconnecting the devices, boards, cards, components inside a PC. d) Precautions to be taken while removing and/or	Theory Test

	re-connecting cables inside a PC.Important Safety Basics e) What one shouldn't wear while working inside a compute. The danger of static electricity. How to protect a PC from lightning strikes and power outages	
DGT/MES/ICT/N12: To have Knowledge of Computer Hardware, their installation and Troubleshooting	AO1. Explain the following: a) Types of I/O devices and ports on a standard PC for connecting I/O devices. b) Function of keyboard, brief principle, types, interfaces, connectors, cable. c) Function of Mouse, brief principle, types, interfaces, connectors, cable. d) Function of monitor, brief principle, resolution, size, types, interfaces, connectors, cable. e) Function of Speakers and Mic, brief principle, types, interfaces, connectors, cable. f) Function of serial port, parallel port, brief principle of communication through these ports, types of devices that can be connected, interface standards, connectors, cable. g) Precaution to be taken while connecting/removing connectors from PC ports. Method of ensuring firm connection.	Theory Test
	AO2. Explain the basics of : a) Types of Processors and their specifications (Intel: Celeron, P4 family, Xeon, and AMD). b) Memory devices, types, principle of storing. Data organization 4 bit, 8 bit, c) Semiconductor memories, RAMROM, PROM, EMPROM, EEPROM, Static and dynamic. d) Concept of track, sector, cylinder. FD Drive components- read write head, head actuator, spindle motor, sensors, PCB. e) Precaution and care to be taken while dismantling Drives. f) Drive bay, sizes, types of drives that can be fitted. Precautions to be taken while removing drive bay from PC. g) HDD, advantages, Principle of working of Hard disk drive, cylinder and clusture, types, capacity, popular brands, standards, interface, jumper setting. Drive components- hard disk platens, and recording media, ,air filter, read write head, head actuator, spindle motor, circuit board, sensor, features like head parking, head	Theory Test

	positioning, reliability, performances, shock mounting capacity. HDD interface IDE, SCSI-I/2/3 comparative study. Latest trends in interface technology in PC and server HDD interface. h) Precautions to be taken while fitting drives into bays and bay inside PC cabinet. i) CMOS setting.(restrict to drive settings only). j) Meaning and need for using Scan disk and defrag. h) Basic blocks of SMPS, description of sample circuit	
	AO3. Identify, Remove-Test-Replace/ Install the following : • front and rear panel controls and ports on a PC • Cases • Cooling • Power Supplies • Power Supply Connections • Motherboard Connections • Motherboard Components • CPU (Processor) • RAM (Memory) • Hard Drive Connections • Mechanical vs. Solid State Drives • ROM Drives • Video Cards • Sound Cards	Practical test
DGT/MES/ICT/N13: To have Knowledge of Installation of Windows OS, Softwares, Antivirus, Drivers and Utility Installations and removal	AO1. Explain the following : a) Types of software. System software-OS, Compiler. Application software-like MS office. Functions of an operating system. Disk operating system.Concept of GUI, Modes of starting on different occasions. b) Desktop, Icon, selecting, choosing, drag and drop. c) My computer, network neighbourhood / network places. d) Recycle bin, briefcase, task bar, start menu, tool bar, and menus. e) Windows Explorer. f) Properties of files and folders. g) Executing application programs. h) Properties of connected devices. i) Applications under windows accessories. j) Windows Help.	Theory Test

	k) Finding files, folders, computers. l) Control panel. Installed devices and properties. Utilities for recovering data from defective/bad hard disks. m) Introduction to removable storage devices, Bulk data storage devices-magnetic, optical, magneto optical drives, WORM drives. n) CD ROM drives- Technology, Types of CD drives, working principle application. o) Minor repairs and maintenance of CD ROM drives. p) Technology, working principle, capacity, media of DVD ROM drive . q) Important parts and functions of DVD ROM drive. r) Minor repair works on a DVD ROM drive. s) Technology, working principle, capacity, media of CD WRITER and use different modes of writing on a CD. Using of utility for CD writing. t) Minor repair works on a CD WRITER. u) Latest trends in backup devices/media Power on self test, Peripheral diagnostics, general purpose diagnostics, Operating system diagnostics. Hardware boot process, Windows boot process.	
	AO2. Demonstrate the Install/ Uninstall the following and can Troubleshoot various problems arising in them: • Windows OS • Hard Disks • Antivirus • Hardware Drivers • Windows Utilities • Other Softwares	Practical Test

Means of assessment 1

The assessment comprise of

- Theory Examination: MCQ, VIVA Voce
- Practical assessment: Role plays, Demonstration

Pass/Fail

The trainee is judged as pass in the qualification if minimum passing marks is obtained in each test i.e Theory and Practical.

Minimum pass mark:
Minimum passing marks for Practical is 60%
Minimum pass marks for theory is 40%

SECTION 2
EVIDENCE OF LEVEL

OPTION A

Title/Name of qualification/component: Computer Hardware Assistant			**Level:** 3
NSQF Domain	**Outcomes of the Qualification/Component**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
Process	The job holder is expected to have the knowledge and display expertise skills in the field of work like: – Basic operation of computer and OS and Peripherals – Fundamentals of electrical, electronics and digital electronics – Basic concepts of Computer repair and maintenance – Understanding of faults of computer systems	The job requires the limited range of activities routine and predictable like repairing and Installing of computer hardwares and drivers.	3
Professional knowledge	The job holder is required to have knowledge in the related field of work like: – Systems and mechanism of computer, components and their interdependencies – Basic principles of Troubleshooting major faults in computer systems – Electrical and electronics Components and its applications – Safety features while handling Electrical and Electronic components	The job holder understands the basic facts, process and principles involved in his job role like basics of computing, Electrical and electronic components characteristics.	3
Professional skill	The job holder is needs to know and understand : – diagnosis of faults of computer systems – Practical applications of test systems. – Planning for configuration – Inspection and testing of configured computer systems – Plan and prepare for the maintenance of computer systems	The job role only includes the Assembling and Maintenance of Computer Systems as per the customer requirement which is routine and repetitive in narrow range of application.	3

Title/Name of qualification/component: Computer Hardware Assistant			**Level:** 3
NSQF Domain	**Outcomes of the Qualification/Component**	**How the job role relates to the NSQF level descriptors**	**NSQF Level**
Core skill	The job holder is expected to be Possess knowledge and skills regarding: – Tools of MS office for communication and presentations – Fundamental internet browsing techniques, associated risks for to communicate with consumers and suppliers	The Job holder will able to repair and maintain computer systems as per the standard manuals. Can operate Internet to communicate with the suppliers and consumers for marketing.	3
Responsibility	The job holder works under the supervision of his superior, as per his directions. He is responsible for his designated task as and when given by the superior.	The job holder works under the supervision of his superiors and is responsible for his own limited work assigned.	3

SECTION 3
EVIDENCE OF NEED

What evidence is there that the qualification is needed?

The increase demand in IT industry would be driven by increasing by household spend on IT, Education, as well as domestic IT demand by Indian companies and MNC established in India

The Indian IT & ITeS industry employs about 3 million directly and 9 million indirectly. A majority of employment is generated through the exports business. Exports contribute about 78 percent of the total employment in the sector. Employment growth was high during FY02–09 period, however, it started settling down with the increasing maturity of the sector and the evolution of non-linear business models

The sector is expected to employ about 5.1 million professionals directly in FY22 and exports are likely to dominate
(Executive Summary of Human Resource and Skill Requirements in IT & ITes by NSDC: Annexure 3)

Moreover more than 5000 individuals have been trained in this course under this scheme in last two years, which shows there is huge requirement of this skill in the Market.(Annexure 4)

About 397 candidates have been placed across country by getting trained under this Course under MES in 2016 which indicates the demand of the above qualification. (Annexure 5)
About 1318 candidates have been placed across country by getting trained under this Course under DDUGKY till Dec 2016.

What is the estimated uptake of this qualification and what is the basis of this estimate?

According to the NSDC, Modularised skill building in these areas is required to ensure constant up-gradation of skills in the projected workforce of 5.1 million persons by 2022. Out of this about 70% to 80 % would be in the junior to midlevel streams (about 4-5 million). Building skills in this workforce is critical for industry to maintain its competitive edge and innovate

What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF?

The Qualification has been mapped with the National Qualification Register, maintained by NSDA to ensure the qualification does not duplicate. Other qualification like Hardware Engineer and Test Engineer-Hardware are available in NQR, but these qualifications are very advanced and detailed which involves development and testing of new hardware. The present qualification involves only Computer Hardware Installation & troubleshooting.

What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

1) DGT interacts with training providers to gather feedback in implementation and updation of qualification.
2) Monitoring of results of assessments
3) Employer feedback will be sought post-placement
4) In a recent initiative, a Mentor Council (MC) for the relevant sector has been formed to review the curriculum of this qualification under the sector.
5) CSTARI, the research wing of DGT, reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis.

The qualification is reviewed after every 2 years for updation according to latest Technologies and practices.

Please attach any documents giving further information about any of the topics above.
Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

SECTION 4
EVIDENCE OF PROGRESSION

What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

An Individual has vertical pathway to promote to higher designations in an organisation. Can further undergo specialization course to excel to the higher post in jobs listed above or can start with up his/her own business.

Progression chart:
Hardware Assistant> Executive Hardware Engineer> Senior Hardware Engineer

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