

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:

**Installation Technician – Computing and
Peripherals**

(QUALIFICATION PACK: Ref. Id. ELE/Q4609)

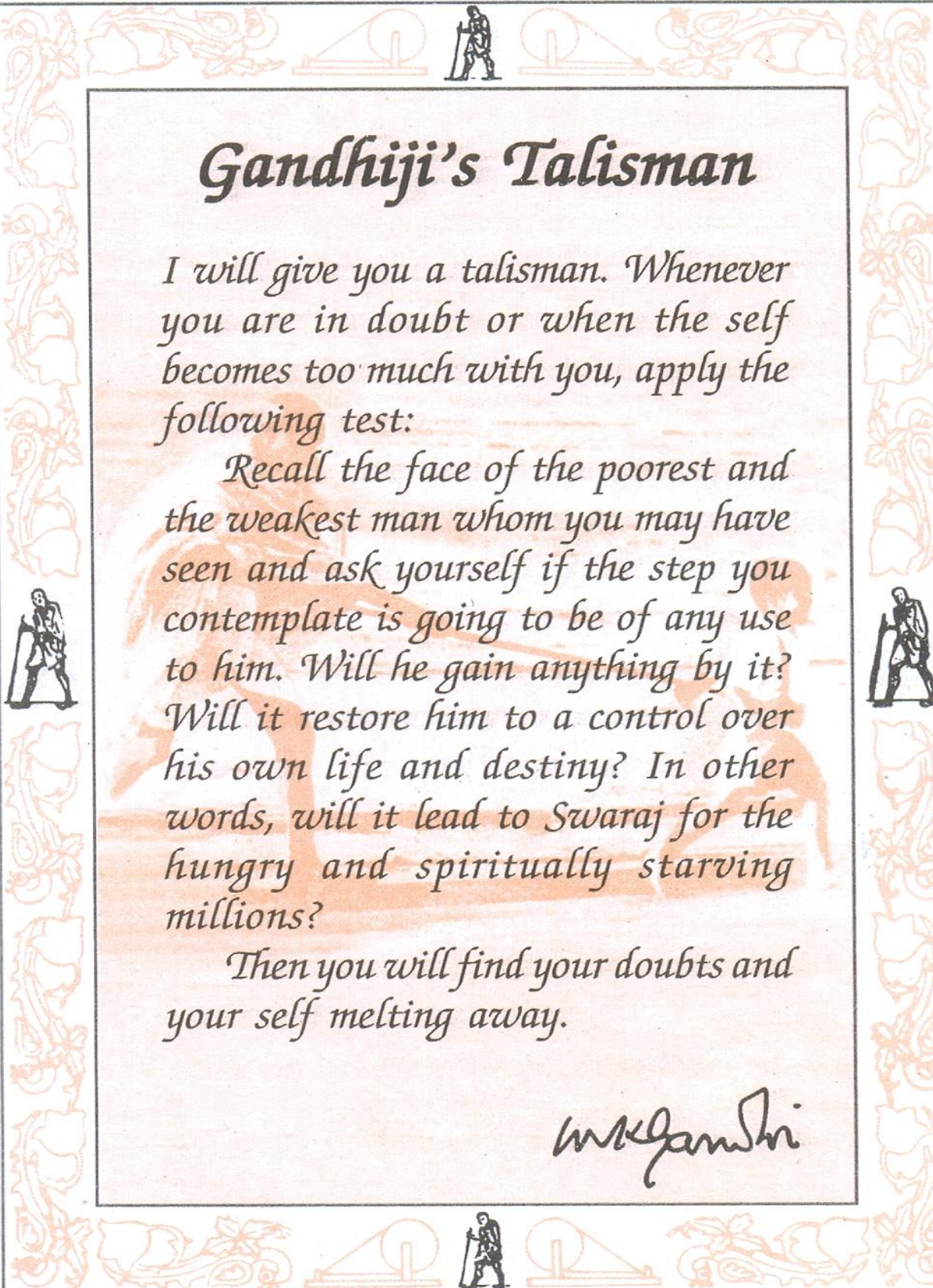
SECTOR: Electronics

Class 9 and 10



**PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal – 462 013, M.P., India**

www.psscive.ac.in



Gandhiji's Talisman

I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test:

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?

Then you will find your doubts and your self melting away.

M.K. Gandhi

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Electronics Sector**

June, 2017

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FOREWORD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) a constituent of the National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based curricula and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education (CSSVSHSE) launched by the Ministry of Human Resource Development, Government of India in 2012. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Rashtriya Madhyamik Shiksha Abhiyan* (RMSA). The main purpose of the competency based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject.

It is a matter of great pleasure to introduce this learning outcome based curriculum as part of the vocational training packages for the job role of **Electronics – Installation Technician Computing and Peripherals**. The curriculum has been developed for the secondary students of vocational education and is aligned to the National Occupation Standards (NOSs) of a job role identified and approved under the National Skill Qualification Framework (NSQF).

The curriculum aims to provide children with employability and vocational skills to support occupational mobility and lifelong learning. It will help them to acquire specific occupational skills that meet employers' immediate needs. The teaching process is to be performed through the interactive sessions in classrooms, practical activities in laboratories and workshops, projects, field visits, and professional experiences.

The curriculum has been developed and reviewed by a group of experts and their contributions are greatly acknowledged. The utility of the curriculum will be adjudged by the qualitative improvement that it brings about in teaching-learning. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about further improvement in this document.

Hrushikesh Senapaty
Director
National Council of Educational Research & Training

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth are immense and the possibilities are equally exciting. The world is looking at us to deliver sustainable growth and progress. To meet the growing expectations, India will largely depend upon its young workforce. The much-discussed demographic dividend will bring sustaining benefits only if this young workforce is skilled and its potential is channelized in the right direction.

In order to fulfil the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Human Resource Development (MHRD), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education that aims to provide for the diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for those pursuing higher education. For spearheading the scheme, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop learning outcome based curricula, student workbooks, teacher handbooks and e-learning materials for the job roles in various sectors, with growth potential for employment.

The PSSCIVE firmly believes that the vocationalisation of education in the nation need to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfil the needs of the society and the world of work. In order to honour its commitment to the nation, the PSSCIVE has initiated the work on developing learning outcome based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training experts, industry representatives, and teachers. The expert group through a series of consultations, working group meetings and use of reference materials develops a National Curriculum. Currently, the Institute is working on developing curricula and courseware for over 100 job roles in various sectors.

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, and valuable time and positively responding to our request for development of curriculum. We are grateful to MHRD and NCERT for the financial support and cooperation in realising the objective of providing learning outcome based modular curricula and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Rashtriya Madhyamik Shiksha Abhiyan (RMSA)* of MHRD.

Finally, for transforming the proposed curriculum design into a vibrant reality of implementation, all the institutions involved in the delivery system shall have to come together with a firm commitment and they should secure optimal community support. The success of this curriculum depends upon its effective implementation and it is expected that the managers of vocational education and training system, including subject teachers will make efforts to create better facilities, develop linkages with the world of work and foster a conducive environment as per the content of the curriculum document.

The PSSCIVE, Bhopal remains committed in bringing about reforms in the vocational education and training system through the learner-centric curricula and courseware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21st Century.

RAJESH P. KHAMBAYAT
Joint Director
PSS Central Institute of Vocational Education

ACKNOWLEDGEMENT

On behalf of the team at the PSS Central Institute of Vocational Education (PSSCIVE) we are grateful to the members of the Project Approval Board (PAB) of Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and the officials of the Ministry of Human Resource Development (MHRD), Government of India for the financial support to the project for development of curricula.

We are grateful to the Director, NCERT for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of RMSA, MHRD, RMSA Cell at the National Council of Educational Research and Training (NCERT), National Skill Development Agency (NSDA) and National Skill Development Corporation (NSDC) and Electronics Sector Skill Council of Indian (ESSCI) for their academic support and cooperation.

We are grateful to the expert contributors Gaurav Kathel and Dipak D. Shudhalwar, Associate Professor (CSE), PSSCIVE, as well as the reviewers, M. A Rizvi, Associate Professor and Head, Department of Computer Engineering and Applications, National Institute of Technical Teachers Training and Research (NITTTR), Shyamla Hills, Bhopal, for their earnest effort and contributions in the development of this learning outcome based curriculum. Their contributions are dully acknowledged.

The contributions made by Vinay Swarup Mehrotra, Professor and Head, Curriculum Development and Evaluation Centre (CDEC), Vipin Kumar Jain, Associate Professor and Head, Programme Planning and Monitoring Cell (PPMC) and Dipak Shudhalwar, Associate Professor (CSE) and Head, Computer Centre, PSSCIVE in development of the curriculum for the employability skills are duly acknowledged.

We are also grateful to the Course Coordinator Dipak D. Shudhalwar, Associate Professor (CSE) and Head Computer Center, PSSCIVE, for bringing out this curriculum in the final form.

PSSCIVE Team

CONTENTS

S.No.	Title		Page No.
	Foreword		i
	Preface		ii
	Acknowledgement		iii
1	Course Overview		1
2	Scheme of Units and Assessment		2
3	Teaching/ Training Activities		6
4	Certification		6
5	Unit Content	Class 9	7
	Part A	Employability Skills	7
		Unit 1: Communication Skills	7
		Unit 2: Self-management Skills	7
		Unit 3: Basic ICT Skills	8
		Unit 4: Entrepreneurial Skills	9
		Unit 5: Green Skills	10
	Part B	Vocational Skills	10
		Unit 1: Installation of Motherboard, CPU, Memory	11
		Unit 2: Installation of Storage Devices	12
		Unit 3: Installation of Peripherals and Expansion Cards	12
		Unit 4: Installation of Video and Display Devices	13
		Class 10	13
	Part A	Unit 1: Communication Skills	13
		Unit 2: Self-management Skills	14
		Unit 3: Basic ICT Skills	15
		Unit 4: Entrepreneurial Skills	16
		Unit 5: Green Skills	16
	Part B	Vocational Skills	17
		Unit 1: Installation & configuration of Desktop Computer	17
		Unit 3: Installation of Operating System and Software	18
		Unit 4: Installation of Printer and Scanner	19
6	Organization of Filed Visits		20
7	List of Equipment and Materials		20
8	Teacher's Qualification		21
9	List of Contributors		21
10	List of Reviewers		21

1. COURSE OVERVIEW

COURSE TITLE: Installation Technician – Computing and Peripherals

Installation Technician also called 'Service Technician', the Filed provides after sale support services to customers, typically, at their premises. The individual at work is responsible for attending to customer complaints, installing newly purchased products, troubleshooting system problems and, configuring peripherals such as printers, scanners and network devices. The job requires the individual to have: ability to build interpersonal relationships and critical thinking. The individual must be willing to travel to client premises in order to attend to calls at different locations. Installing the system and configuring the peripherals, and attending to field calls from customer and complaints for system trouble shooting and repairs.

COURSE OUTCOMES: On completion of the course, students should be able to:

- ✓ Apply effective oral and written communication skills to interact with people and customers;
- ✓ Identify the principal components of a computer system;
- ✓ Demonstrate the basic skills of using computer;
- ✓ Demonstrate self-management skills;
- ✓ Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- ✓ Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ✓ Identify the principal components of a computer system
- ✓ Identify and control hazards in the workplace that pose a danger or threat to their safety or health, or that of others.
- ✓ Install and the system and configure the peripherals.
- ✓ Attend to field calls from customer and complaints for system trouble shooting and repairs.
- ✓ Interact with the customer prior to visit.
- ✓ Understand customer's requirements on visit or prior to visit.
- ✓ Suggest possible solutions.
- ✓ Complete the documentation.
- ✓ Achieve productivity and quality as per norms.

COURSE REQUIREMENTS: The learner should have basic knowledge of science.

COURSE LEVEL: This course can be taken up at Intermediate level in Class 11 and Class 12.

COURSE DURATION: Total : 400 hrs

Class 9 : 200 hrs

Class 10 : 200 hrs

Total: 400 hrs

2. SCHEME OF UNITS AND ASSESSMENT

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Class 9 and 10 opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Class 11 is as follows:

CLASS 9			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1: Communication Skills	20	10
	Unit 2: Self-management Skills	10	
	Unit 3: Basic ICT Skills	25	
	Unit 4: Entrepreneurial Skills	15	
	Unit 5: Green Skills	10	
	Total	80	10
Part B	Vocational Skills		
	Unit 1: Installation of Motherboard, CPU, Memory	30	30
	Unit 2: Installation of Storage Devices	20	
	Unit 3: Installation of Peripherals and Expansion Cards	20	
	Unit 4: Installation of Video and Display Devices	20	
	Total	90	30
Part C	Practical Work		
	Practical Examination	6	15
	Written Test	1	10
	Viva Voce	3	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/ Student Portfolio	10	10
	Viva Voce	5	5
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)	05	10
	Total	200	100

The unit-wise distribution of hours and marks for **Class 10** is as follows:

CLASS 10			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1: Communication Skills	20	10
	Unit 2: Self-management Skills	10	
	Unit 3: Basic ICT Skills	25	
	Unit 4: Entrepreneurial Skills	15	
	Unit 5: Green Skills	10	
	Total	80	10
Part B	Vocational Skills		
	Unit 1: Installation and configuration of Desktop Computer	30	30
	Unit 3: Installation of Operating System and Software	40	
	Unit 4: Installation of Printer & Scanner	20	
	Total	90	30
Part C	Practical Work		
	Practical Examination	6	15
	Written Test	1	10
	Viva Voce	3	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/ Student Portfolio	10	10
	Viva Voce	5	5
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)	05	10
	Total	200	100

Duration: 3 hrs

Max. Mark: 30

	Typology of Question	Very Short Answer (1 Mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	Marks
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	2	1	2	10
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	1	2	2	11
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	1	1	05
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	1	0	02
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	Total	3x1=3	6x2=12	5x3=15	30 (14 Questions)

PRACTICAL EXAMINATION

Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce.

For practical, there should be a team of two evaluators – the subject teacher and the expert from the relevant industry certified by the Board or concerned Sector Skill Council. The same team of examiners will conduct the viva voce. Viva voce allows candidates to demonstrate communication skills and content knowledge. Audio or video recording can be done at the time of viva voce. The number of external examiners would be decided as per the existing norms of the Board and these norms should be suitably adopted/adapted as per the specific requirements of the vocational subject.

Project Work (individual or group projects) are a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organised as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio. Student Portfolio is a compilation of documents that supports the candidate's claim of competence. Documents may include reports, articles, photos of products prepared by students in relation to the unit of competency, etc. Viva-voce should also be conducted to obtain feedback on the student's experiences and learning during the project work/field visits.

CONTINUOUS AND COMPREHENSIVE EVALUATION

Continuous and Comprehensive Evaluation (CCE) refers to a system of school-based evaluation of students that covers all aspects of student's development. In this scheme, the term 'continuous' is meant to emphasize that evaluation of identified aspects of students 'growth and development' is a continuous process rather than an event, built into the total teaching-learning process and spread over the entire span of academic session. The second term 'comprehensive' means that the scheme attempts to cover both the scholastic and the co-scholastic aspects of students' growth and development. For details, please refer to the CCE manual of Central Board of Secondary Education (CBSE).

3. TEACHING/TRAINING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/ workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace. Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained vocational teachers. Vocational teachers should make effective use of a variety of instructional aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

Practical work may include but not limited to hands-on-training, simulated training, role play, case based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the vocational teacher to the Head of the Institution.

FIELD VISITS/ EDUCATIONAL TOUR

In field visits, children will go outside the classroom to obtain specific information from experts or to make observations of the activities. A checklist of observations to be made by the students during the field visits should be developed by the Vocational Teachers for systematic collection of information by the students on the various aspects. Principals and Teachers should identify the different opportunities for field visits within a short distance from the school and make necessary arrangements for the visits. At least three field visits should be conducted in a year.

4. ASSESSMENT AND CERTIFICATION

Upon successful completion of the course by the candidate, the Central/ State Examination Board for Secondary Education and the respective Sector Skill Council will certify the competencies.

The National Skills Qualifications Framework (NSQF) is based on outcomes referenced to the National Occupation Standards (NOSs), rather than inputs. The NSQF level descriptors, which are the learning outcomes for each level, include the process, professional knowledge, professional skills, core skills and responsibility. The assessment is to be undertaken to verify that individuals have the knowledge and skills needed to perform a particular job and that the learning programme undertaken has delivered education at a given standard. It should be closely linked to certification so that the individual and the employer could come to know the competencies acquired through the vocational subject or course. The assessment should be reliable, valid, flexible, convenient, cost effective and above all it should be fair and transparent. Standardized assessment tools should be used for assessment of knowledge of students. Necessary arrangements should be made for using technology in assessment of students.

KNOWLEDGE ASSESSMENT (THEORY)

Knowledge Assessment should include two components: one comprising of internal assessment and second an external examination, including theory examination to be conducted by the Board. The assessment tools shall contain components for testing the knowledge and application of knowledge. The knowledge test can be objective paper based test or short structured questions based on the content of the curriculum.

WRITTEN TEST

It allows candidates to demonstrate that they have the knowledge and understanding of a given topic. Theory question paper for the vocational subject should be prepared by the subject experts comprising group of experts of academicians, experts from existing vocational subject experts/teachers, and subject experts from university/colleges or industry. The respective Sector Skill Council should be consulted by the Central/State Board for preparing the panel of experts for question paper setting and conducting the examinations.

The blue print for the question paper may be as follows:

Duration: 3 hrs

Max. Mark: 30

	Typology of Question	No. of Questions			Marks
		Very Short Answer (1 mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	3	2	2	13
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	2	3	2	14
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	2	1	07
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	2	0	04
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	Total	5x1=5	10x2=20	5x3=15	40 (20 questions)

SKILL ASSESSMENT (PRACTICAL)

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, using a competency checklist. The competency checklist should be developed as per the National Occupation Standards (NOSs) given in the Qualification Pack for the Job Role to bring about necessary consistency in the quality of assessment across different sectors and Institutions. The student has to demonstrate competency against the performance criteria defined in the National Occupation Standards and the assessment will indicate that they are 'competent', or are 'not yet competent'. The assessors assessing the skills of the students should possess a current experience in the industry and should have undergone an effective training in assessment principles and practices. The Sector Skill Councils should ensure that the assessors are provided with the training on the assessment of competencies.

Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce. For practical, there should be a team of two evaluators – the subject teacher and the expert from the

relevant industry certified by the Board or concerned Sector Skill Council. The same team of examiners will conduct the viva voce.

Project Work (individual or group project) is a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organised as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio.

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5. UNIT CONTENTS

CLASS 9

Part A: Employability Skills

Sn	Units	Duration in Hours
1.	Unit 1: Communication Skills	20
2.	Unit 2: Self-management Skills	10
3.	Unit 3: Basic ICT Skills	25
4.	Unit 4: Entrepreneurial Skills	15
5.	Unit 5: Green Skills	10
Total		80

Unit 1: Communication Skills – I				
S. No.	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20 Hrs
1.	Demonstrate knowledge of various methods of communication.	<ul style="list-style-type: none"> • Methods of communication. • Verbal. • Non-verbal. • Visual. 	<ul style="list-style-type: none"> • Writing pros and cons of written, verbal and non-verbal communication. • Listing dos and don'ts for avoiding common body language mistakes. 	05
2.	Identify elements of communication cycle.	<ul style="list-style-type: none"> • Meaning of communication • Importance of communication skills • Elements of communication cycle– • (i) sender, • (ii) ideas, • (iii) encoding, • (iv) communication channel, • (v) receiver, • (vi) decoding, and • (vii) feedback 	<ul style="list-style-type: none"> • Draw a diagram of communication cycle • Role plays on communication process related to the sector/job role. 	05
3.	Identify the factors affecting our perspectives in communication	<ul style="list-style-type: none"> • Perspectives in communication. • Factors affecting perspectives in communication. • Visual perception. • Language. • Past experience. • Prejudices. • Feelings. • Environment. 	<ul style="list-style-type: none"> • Group discussion on factors affecting perspectives in communication. • Sharing of experiences on factors affecting perspectives. • Sharing experiences on factors affecting communication at workplace. 	05
4.	Demonstrate the knowledge of	<ul style="list-style-type: none"> • Writing skills related to the following: 	<ul style="list-style-type: none"> • Demonstration and practice of writing sentences and 	05

	basic writing skills	<ul style="list-style-type: none"> • Phrases • Kinds of sentences • Parts of sentence • Parts of speech • Use of articles • Construction of a paragraph 	paragraphs on topics related to the subject.	
Total Duration in Hours				20

Unit 2: Self Management Skills – I

S. No.	Learning Outcome	Theory (07 Hours)	Practical (03 Hours)	10 Hrs
1.	Describe the meaning and importance of self-management.	<ul style="list-style-type: none"> • Meaning of self-management. • Positive results of self-management. • Self-management skills. 	<ul style="list-style-type: none"> • Identification of self-management skills • Strength and weakness analysis. 	05
2.	Identify the factors that helps in building self-confidence .	<ul style="list-style-type: none"> • Factors that help in building self-confidence – social, cultural, and physical factors • Self-confidence building tips - getting rid of the negative thoughts, thinking positively, staying happy with small things, staying clean, hygienic and smart, chatting with positive people, etc. 	<ul style="list-style-type: none"> • Role play exercises on building self-confidence. • Use of positive metaphors/ words. • Positive stroking on wakeup and before going bed. • Helping others and working for community. 	05
Total Duration in Hours				10

Unit 3: Basic ICT Skills - I

S.No.	Learning Outcome	Theory (10 Hours)	Practical (15 Hours)	25 Hrs
1.	Describe the role of ICT in day-to-day life.	<ul style="list-style-type: none"> • Introduction to ICT • Role and importance of ICT in personal life and at workplace • ICT in our daily life (examples) • ICT tools – Mobile, tab, radio, TV, email, etc. 	<ul style="list-style-type: none"> • Discussion on the role and importance of ICT in personal life and at workplace. • Preparing posters / collages for showing the role of ICT at workplace 	02
2.	Identify the various components of computer system	<ul style="list-style-type: none"> • Basic components of computer system. • Hardware and software. • Primary and secondary memory. • Input, Output and Storage devices. 	<ul style="list-style-type: none"> • Identify and name the various components of computer system. • List few hardware and software. • Identify and name the primary and secondary memory. • Identify the various Input, Output and Storage devices. 	05
3.	Identify various peripheral devices	<ul style="list-style-type: none"> • Various peripheral devices and their use. • Examples of peripherals. 	<ul style="list-style-type: none"> • List various peripheral devices. • Give the examples of peripheral devices. 	04

			<ul style="list-style-type: none"> Practice using peripheral devices. 	
4.	Perform basic computer operations	<ul style="list-style-type: none"> Procedure for starting and shutting down a computer. Operating Systems (OS). Types of OS – DOS, Windows, Linux. Desktop of Windows and Linux. Files and folder. Keyboard and mouse operations. Common desktop operations. 	<ul style="list-style-type: none"> Start the computer in proper sequence and get the initial screen. Identify the installed OS on computer. Identify the desktop and its various components. Work with desktop. Create file and folder. Perform keyboard and mouse operations. 	06
5.	Connect with the world using Internet and its applications	<ul style="list-style-type: none"> Introduction to Internet. Applications of Internet. Internet Browser. Websites and webpages. Email applications. Email accounts. Sending and receiving email. Introduction to social media. Blog. Twitter. Facebook. Youtube. WhatsApp. Digital India. 	<ul style="list-style-type: none"> Introduce with Internet. Explain the applications of Internet. List the various Internet Browser. Search the websites. Create Email account. Send and receive email. Use Social Media for education. Use Blog. Use Twitter. Use Facebook. Use Youtube. Use WhatsApp. Use Digital India. 	08
Total Duration in Hours				25

Unit 4: Entrepreneurial Skills – I				
S. No.	Learning Outcome	Theory (06 Hours)	Practical (09 Hours)	15 Hrs
1.	Identify various types of business activities	<ul style="list-style-type: none"> Types of businesses – service, manufacturing, hybrid. Types of businesses found in our community Business activities around us. 	<ul style="list-style-type: none"> Prepare posters of business activities found in cities/ villages, using pictures. Discuss the various types of activities, generally adopted by small businesses in a local community. Best out of waste. Costing of the product made out of waste. Selling of items made from waste materials. Prepare list of businesses that provides goods and services in exchange for money. 	09
2.	Demonstrate the knowledge of distinguishing characteristics of	<ul style="list-style-type: none"> Meaning of entrepreneurship development. Distinguishing characteristics of entrepreneurship. 	<ul style="list-style-type: none"> Prepare charts showing advantages of entrepreneurship over wages. Group discussions on role and 	06

	entrepreneurship	<ul style="list-style-type: none"> Role and rewards of entrepreneurship. 	<ul style="list-style-type: none"> features of entrepreneurship. Lectures/presentations by entrepreneurs on their experiences and success stories. Identify core skills of successful entrepreneur. 	
Total Duration in Hours				15

Unit 5: Green Skills – I				
S. No.	Learning Outcome	Theory (03 Hours)	Practical (07 Hours)	10 Hrs
1.	Demonstrate the knowledge of the factors influencing natural resource conservation.	<ul style="list-style-type: none"> Introduction to environment. Relationship between society and environment, ecosystem and factors causing imbalance. Natural resource conservation. Environment protection and conservation. 	<ul style="list-style-type: none"> Group discussion on hazards of deteriorating environment. Prepare posters showing environment conservation. Discussion on various factors that influence our environment. 	05
2.	Describe the importance of green economy and green skills.	<ul style="list-style-type: none"> Definition of green economy Importance of green economy 	<ul style="list-style-type: none"> Discussion on the benefits of green skills and importance of green economy. Prepare a Poster showing the importance of green economy with the help of newspaper/ magazine cuttings. 	05
Total Duration in Hours				10

Part B: Vocational Skills

S. No.	Units	Duration in Hours
1.	Unit 1: Installation of Motherboard, CPU, Memory	30
2.	Unit 2: Installation of Storage Devices	20
3.	Unit 3: Installation of Peripherals and Expansion Cards	20
4.	Unit 4: Installation of Video and Display Devices	20
	Total Duration	90

Unit 1: Installation of Motherboard, CPU, Memory				
S. No.	Learning Outcome	Theory (15 Hours)	Practical (15 Hours)	30 Hrs
1.	Identify the given component formed on motherboard	<ul style="list-style-type: none"> Introduction to motherboard. Current make and models of motherboards. Components of motherboard. Processor sockets, memory banks on the motherboard and expansion slots. 	<ul style="list-style-type: none"> List the current make and models of motherboards. Identify various component on the motherboard. Identify the processor sockets, memory banks on the motherboard. 	06

		<ul style="list-style-type: none"> Ports on the motherboard. Motherboard form factors and its types. Various connectors and jumpers on the motherboard. CMOS (Complementary Metal-Oxide Semiconductor). Setup parameters and features on motherboard. 	<ul style="list-style-type: none"> Identify various expansion slots and ports on the motherboard. Identify various connectors and jumpers on the motherboard. Identify the CMOS Change setup parameters and features on the motherboard. 	
2.	Perform the given setting on BIOS	<ul style="list-style-type: none"> BIOS and CMOS Accessing BIOS Various BIOS settings – Boot sequence, Visualization support, Clock speed, Security. POST and other diagnostics. 	<ul style="list-style-type: none"> Access BIOS Verify the existing BIOS settings. Set or change BIOS configurations. 	06
3.	Explain the given characteristic of processor (CPU)	<ul style="list-style-type: none"> Introduction to processor. CPU Generations. Characteristics of CPU chips – 32 bits, 64 bits. Configuration and capability of CPU chips. Different generations of CPU. CPU socket types – Intel and AMD. 	<ul style="list-style-type: none"> Identify and name the current CPU chips. Collect configuration of current CPU chips. Collect the pictures and videos of various types of processor and observe the difference in technology. 	06
4.	Install CPU	<ul style="list-style-type: none"> Installation process of CPU. Voltage, clock multiplier and bus speed. 	<ul style="list-style-type: none"> Watch the video for installation of CPU. Install CPU and test it for proper functioning. Use the diagnostic tool. 	06
5.	Install and test Memory card	<ul style="list-style-type: none"> Introduction to Memory. Types of RAM and ROM. Memory form factors and slot types. Characteristics of RAM. Speed requirements of RAM. Single, Dual and Triple channel architecture. Single vs double sided. 	<ul style="list-style-type: none"> Identify the various types of RAM chips. Identify and install the slot to install the RAM chip Test the RAM for proper functioning. Verify the capability and speed of the RAM on the system. 	06
Total Duration in Hours				30

Unit 2: Installation of Storage Devices

S. No.	Learning Outcome	Theory (10 Hours)	Practical (10 Hours)	20 Hrs
1.	Classify Hard disk drives based on their working characteristics	<ul style="list-style-type: none"> Introduction of Hard Disk Drive (HDD). Physical and logical components of HDD. HDD speeds and characteristics. External connections types. 	<ul style="list-style-type: none"> Identify the physical and logical components of HDD. Observe the working of HDD in video clip. Compare the solid state drives with normal drive. Identify and list other storage 	10

		<ul style="list-style-type: none"> • Solid state drives. • Optical disk drives. 	media.	
2.	Install/uninstall storage devices	<ul style="list-style-type: none"> • Installation process of optical drive. interfaces – IDE, EIDE, PATA. • Master and slave configuration. • SATA and SSD. • SATA connectors & cables. • SCSI Interfaces. • Common symptoms of problem in HDD. 	<ul style="list-style-type: none"> • Install optical drive. • Identify the different disk drive interfaces. • Identify SATA data connectors and cables. • Identify the problems in HDD if any. • Disconnect the HDD • Re-connect the HDD. 	10
Total Duration in Hours				20

Unit 3: Installation of Peripherals and Expansion Cards				
S. No.	Learning Outcome	Theory (10 Hours)	Practical (10 Hours)	20 Hrs
1.	Install and configure the given peripheral devices.	<ul style="list-style-type: none"> • The various peripheral devices. • Device drivers. • Connectivity of various peripheral devices with the system. 	<ul style="list-style-type: none"> • Identify and list various peripheral device. • Connect the peripheral devices like printer and scanner in appropriate port. • Install the device driver and configure the peripherals. 	10
2.	Identify the given connector type and associated cable.	<ul style="list-style-type: none"> • Types of connector and associated cable. • USB controller. • Firewire. • Firewire cables and connections. 	<ul style="list-style-type: none"> • Identify various types of connector and cable. • Connect the devices to USB port. • Identify the firewire cables and connections. 	05
3.	Install and configure expansion cards.	<ul style="list-style-type: none"> • Various types of expansion cards and its connectivity. • Steps to add expansion card. 	<ul style="list-style-type: none"> • Identify the various types of expansion/ add on cards. • Fix the add on card in slot. • Install/configure relevant driver for the add on card 	05
Total Duration in Hours				20

Unit 4: Installation of Video and Display Devices				
S. No.	Learning Outcome	Theory (10 Hours)	Practical (10 Hours)	20 Hrs
1.	Explain characteristics and features of display devices	<ul style="list-style-type: none"> • Different types of display devices – CRT, LCD, LED, Plasma, Projector, OLED. • Common resolution of various display. • Configuration of resolution. 	<ul style="list-style-type: none"> • Identify the different display devices. • Identify the resolution of various display. • Configure the resolution in Windows. 	10
2.	Identify video	<ul style="list-style-type: none"> • Various types of connectors 	<ul style="list-style-type: none"> • Identify various types of 	05

	connector types and associated cables	and cables. <ul style="list-style-type: none"> Interface. VGA, DVI, HDMI Adapters. Other connections. Display ports. Video cards and drivers. 	connectors and cables. <ul style="list-style-type: none"> Identify the port. Connect the devices in the appropriate port. Verify the connectivity and make the connected device functional. 	
3.	Troubleshoot common video and display issues	<ul style="list-style-type: none"> Basic troubleshooting. VGA mode, No image on screen, Dim/ Flickering image, Discoloration, Overheat shutdown, Dead pixels, Artifacts and distorted images. Color patterns. 	<ul style="list-style-type: none"> Rectify the common display issues. Rectify the problem in display. Correct the problem in display. 	05
Total Duration in Hours				20

CLASS 10

Part A: Employability Skills

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills	20
2.	Unit 2: Self-management Skills	10
3.	Unit 3: Basic ICT Skills	25
4.	Unit 4: Entrepreneurial Skills	15
5.	Unit 5: Green Skills	10
Total		80

Unit 1: Communication Skills – II				
S. No.	Learning Outcome	Theory (12 Hours)	Practical (08 Hours)	20 Hrs
1.	Demonstrate knowledge of various methods of communication.	<ul style="list-style-type: none"> Methods of communication Verbal. Non-verbal. Visual. 	<ul style="list-style-type: none"> Writing pros and cons of written, verbal and non-verbal communication Listing do's and don'ts for avoiding common body language mistakes 	04
2.	Provide descriptive and specific feedback.	<ul style="list-style-type: none"> Communication cycle and importance of feedback. Meaning and importance of feedback. Descriptive feedback - written comments or conversations. Specific and non-specific feedback. 	<ul style="list-style-type: none"> Constructing sentences for providing descriptive and specific feedback. 	04

3.	Apply measures to overcome barriers in communication.	<ul style="list-style-type: none"> Barriers to effective communication – types and factors. Measures to overcome barriers in effective. Communication. 	<ul style="list-style-type: none"> Enlisting barriers to effective communication. Applying measures to overcome barriers in communication. 	04
4.	Apply principles of communication.	<ul style="list-style-type: none"> Principles of effective communication. 7 Cs of effective communication. 	<ul style="list-style-type: none"> Constructing sentences that convey all facts required by the receiver. Expressing in a manner that shows respect to the receiver of the message Exercises and games on applying 7Cs of effective communication. 	04
5.	Demonstrate basic writing skills.	<ul style="list-style-type: none"> Writing skills to the following: <ul style="list-style-type: none"> Sentence Phrase Kinds of Sentences Parts of Sentence Parts of Speech Articles Construction of a Paragraph. 	<ul style="list-style-type: none"> Demonstration and practice of writing sentences and paragraphs on topics related to the subject. 	04
Total Duration in Hours				20

Unit 2: Self-management Skills – II				
S. No.	Learning Outcome	Theory (05 Hours)	Practical (05 Hours)	10 Hrs
1.	Apply stress management techniques	<ul style="list-style-type: none"> Meaning and importance of stress management Stress management techniques – physical exercise, yoga, meditation Enjoying, going to vacations and holidays with family and friends Taking nature walks 	<ul style="list-style-type: none"> Exercises on stress management techniques – yoga, meditation, physical exercises. Preparing a write-up on an essay on experiences during a holiday trip. 	04
2.	Demonstrate the ability to work independently	<ul style="list-style-type: none"> Importance of the ability to work independently. Describe the types of self-awareness. Describe the meaning of self-motivation and self-regulation. 	<ul style="list-style-type: none"> Demonstration on working independently goals. Planning of an activity Executing tasks in a specific period, with no help or directives. Demonstration on the qualities required for working independently. 	06
Total Duration in Hours				10

Unit 3: Basic ICT Skills – II				
S.	Learning Outcome	Theory	Practical	25

No.		(10 Hours)	(15 Hours)	Hrs
1.	Prepare documentation using Word Processing Application	<ul style="list-style-type: none"> • Introduction to word processing. • Software packages for word processing. • Opening and exiting the word processor. • Creating a document. • Saving document. • Text editing. • Word wrap and alignment. • Font size, type and face. • Header and Footer. • Auto Correct. • Numbering and Bullet. • Creating Table. • Password protection. • Printing document. • Find and Replace. • Page numbering. • Saving a document in various formats. 	<ul style="list-style-type: none"> • List the features of word processing. • List the software packages for word processing. • Open and exit the word processor. • Create a document. • Edit the text. • Wrap and align the text. • Change the font type, size, and face. • Insert Header and Footer. • Use Autocorrect option. • Assign numbering and bullets to list items. • Create Table. • Save the document. • Protect the document with password. • Print the document. • Use Find and Replace. • Give page numbering. • Save the document in various formats. 	10
2.	Perform Tabulation using Spreadsheet Application	<ul style="list-style-type: none"> • Introduction to spreadsheet application. • Various spreadsheet applications. • Creating a new worksheet. • Opening workbook and entering data. • Resizing fonts and styles. • Copying and moving. • Filter and sorting. • Formulas and functions. • Password protection. • Printing a spreadsheet. • Saving a spreadsheet in various formats. 	<ul style="list-style-type: none"> • Introduce with the spreadsheet application. • List the spreadsheet applications. • Create a new worksheet. • Open the workbook and enter text. • Resize fonts and styles. • Copy and move the cell data. • Sort and Filter the data. • Apply elementary formulas and functions. • Protect the spreadsheet with password. • Print a spreadsheet. • Save the spreadsheet in various formats. 	10
3.	Prepare Presentation using Presentation Application	<ul style="list-style-type: none"> • Introduction to presentation software • Software packages for presentation. • Creating a new presentation. • Entering and editing text. • Adding a slide. • Deleting a slide. • Formatting text. • Inserting clipart & images. • Slide layout. 	<ul style="list-style-type: none"> • Explain the features of presentation. • List the software packages for presentation. • Create a new presentation. • Add a slide to presentation. • Delete a slide. • Enter and edit text. • Format text. • Insert clipart & images. • Slide layout. 	05

		<ul style="list-style-type: none"> • Slide transition and custom animation. • Saving a presentation. • Printing a presentation. 	<ul style="list-style-type: none"> • Save a presentation. • Print a presentation. document. 	
			Total Duration in Hours	25

Unit 4: Entrepreneurial Skills – II

S. No.	Learning Outcome	Theory (06 Hours)	Practical (09 Hours)	15 Hrs
1.	List the characteristics of successful entrepreneur	<ul style="list-style-type: none"> • Entrepreneurship and society. • Qualities and functions of an entrepreneur. • Role and importance of an entrepreneur. • Myth about entrepreneurship. • Entrepreneurship as a career option. 	<ul style="list-style-type: none"> • Writing a note on entrepreneurship as career option. • Collecting success stories of first generation and local entrepreneurs. • Listing the entrepreneurial qualities – analysis of strength and weaknesses. • Group discussion of self-qualities that students feel are needed to become successful entrepreneur. • Collect information and related data for a business. • Make a plan in team for setting up a business. 	15
			Total Duration in Hours	15

Unit 5: Green Skills – II

S. No.	Learning Outcome	Theory (07 Hours)	Practical (03 Hours)	10 Hrs
1.	Demonstrate the knowledge of importance, problems and solutions related to sustainable development	<ul style="list-style-type: none"> • Definition of sustainable development. • Importance of sustainable development. • Problems related to sustainable development. 	<ul style="list-style-type: none"> • Identify the problem related to sustainable development in the community. • Group discussion on the importance of respecting and conserving indigenous knowledge & cultural heritage. • Discussion on the responsibilities and benefits of environmental citizenship, including the conservation and protection of environmental values. • Preparing models on rain water harvesting, drip / sprinkler irrigation, vermin-compost, solar energy, solar cooker, etc. 	10
			Total Duration in Hours	10

Part B: Vocational Skills

S. No.	Units	Duration in Hours
1.	Unit 1: Installation and configuration of Desktop Computer	30
2.	Unit 2: Installation of Operating System and Software	40
3.	Unit 3: Installation of Printer and Scanner	20
	Total Duration	90

Unit 1: Installation and configuration of Desktop Computer				
S. No.	Learning Outcome	Theory (10 Hours)	Practical (20 Hours)	30 Hrs
1.	Add and remove field-replaceable modules for desktop.	<ul style="list-style-type: none"> Field-replaceable modules in desktop. Procedures to add and remove modules in the desktop. 	<ul style="list-style-type: none"> Identify the various modules of desktop and the place of installation. Apply the established procedure to add and remove the modules 	06
2.	Install and configure devices.	<ul style="list-style-type: none"> Typical IRQs, DMAs, and I/O addresses and settings. Procedure to change the settings. 	<ul style="list-style-type: none"> Identify typical IRQs, DMAs, and I/O addresses. Alter the settings when installing and configuring devices. 	08
3.	Install and configure common IDE devices.	<ul style="list-style-type: none"> Establish procedure to install and configure common IDE devices. 	<ul style="list-style-type: none"> Follow established practices to install and configure common IDE devices. 	04
4.	Install, configure, and upgrade system components.	<ul style="list-style-type: none"> System components. Installation of system components. Configuration of system components. Up-gradation of system components. 	<ul style="list-style-type: none"> Identify and name the system components. Install system components. Configure the system components. Up-grade the system components. 	10
			Total Duration in Hours	30
Unit 2: Installation of operating System and Software				
S. No.	Learning Outcome	Theory (20 Hours)	Practical (20 Hours)	40 Hrs
1.	Prepare for installation of Windows 10	<ul style="list-style-type: none"> System configuration – processor, RAM, HDD. Introduction to desktop operating system – Windows. BIOS settings. Installation media. Installation manual. License agreement. Installation key. HDD Partitioning. 	<ul style="list-style-type: none"> Start the computer and check the BIOS settings. Note the system configuration. Match the requirement of OS installation with the exiting system configuration. Set or change boot sequence in BIOS settings as per installation media. Save the BIOS settings. 	06

		<ul style="list-style-type: none"> Types of file system. Device drivers – VGA, Sound. 		
2.	Install and configure Windows 10 OS.	<ul style="list-style-type: none"> Procedure for installing Windows 10. Windows 10 device setting. Procedure to configure devices in Windows 10. Procedure to configure network connectivity in Windows 10. Procedure to connect wired and wireless network in Windows 10. 	<ul style="list-style-type: none"> Insert the media for installation. Read and interpret the license agreement. Make the partitions in HDD. Format the HDD with the required file system. Choose the appropriate partition to install OS. Follow the installation instructions and provide the necessary data. Confirm for the complete installation with all device drivers. 	08
3.	Use various Windows utilities	<ul style="list-style-type: none"> The various system utilities and its features. Installing and using system utilities. Installation of anti-virus. Using anti-virus software for removing virus. Firewall and its configuration. System requirement and installation of various software and utilities. 	<ul style="list-style-type: none"> List out the various system utilities. Install and use various system utilities. Install the anti-virus software. Run the anti-virus software to detect and remove virus. Configure firewall. Install and configure various software and system utilities. 	08
4.	Install anti-virus and software packages	<ul style="list-style-type: none"> Anti-virus packages – latest version with features Installation process. How to run anti-virus software for detection and removal of viruses. 	<ul style="list-style-type: none"> List out the latest anti-virus packages with its version and features. Read the installation instructions. Install the anti virus software. Run the anti-virus software to detect and remove virus. 	06
5.	Install and configure Linux OS.	<ul style="list-style-type: none"> Procedure to install and configure Linux. Installation of packages. Procedure to configure devices in Linux. Procedure to configure wired and wireless network in Linux. Creating user accounts. Updating and upgrading Linux. Troubleshooting Linux. 	<ul style="list-style-type: none"> Insert media for installation. Make the partitions in HDD. Format the HDD with the required file system. Choose the appropriate partition to install OS. Follow the installation instructions and provide the necessary data. Confirm for the complete installation with all device drivers. 	10
Total Duration in Hours				40

Unit 3: Installation of Printer and Scanner				
S. No.	Learning Outcome	Theory (10 Hours)	Practical (10 Hours)	20 Hrs
1.	Identify the fundamental working principles of printers and scanners	<ul style="list-style-type: none"> Basics of printer and scanner. Terminology in printing and scanning. Fundamental principle of printer and scanner. 	<ul style="list-style-type: none"> List the printing terminology. Identify the fundamental principle of printing and scanning. 	04
2.	Describe printing and scanning technologies.	<ul style="list-style-type: none"> Printing and scanning technology. Working of printer. Working of scanner. Types of printers. Types of scanners. 	<ul style="list-style-type: none"> Observe the printing process and working for different printers. Observe the scanning process and working of different scanner. 	04
3.	Establish the proper connectivity of printer and scanner	<ul style="list-style-type: none"> Printer and scanner components. Interfaces. Connectors. Consumables and accessories. 	<ul style="list-style-type: none"> Identify the components of printer and scanner. Identify interfaces and connectors for printer and scanner. Connect printer and scanner to computer. Identify the consumables and accessories for printing. 	06
4.	Install, configure, optimize, and upgrade printers and scanners.	<ul style="list-style-type: none"> Requirement for installation. Installation process and commands under Windows and Linux. Adding network printer. 	<ul style="list-style-type: none"> Observe the requirement for printer installation. Install the printer by following the instructions. Add network printer. 	06
			Total Duration in Hours	20

6. ORGANISATION OF FIELD VISITS

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace.

Visit a computer assembly and service centre and observe the following: Location, Site, Computer systems and peripheral devices. During the visit, students should obtain the following information from the owner or the supervisor of the nursery:

1. Computer System of various brands.
2. Computer parts and peripherals of various brands.
3. Specifications of various parts of computer system.
4. Comparison of various brands.
5. External and Internal Hard Disk.
6. Storage capacity of various storage devices.
7. Comparison of various parts based on cost.
8. Tools and equipment required for computer assembly.
9. Cost benefit analysis to purchase computer.
10. Specifications of computer based on the work requirement.
11. Any other information

7. LIST OF EQUIPMENT AND MATERIALS

The list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

Tools	Equipment	Materials
<ul style="list-style-type: none"> • Components / Dividers • Oscilloscope • Rulers • T-square • Multi-tester • Pliers • Cutters • Screw drivers • Goggles • Gloves • Protractor • Steel rule • LAN tester • Utility softwares • Anti-static wrist wrap • Masks • Crimping tools • Flashlights • Sharp pointed tweezers • Mirror (inspection) • Soldering gun 	<ul style="list-style-type: none"> • Hubs/switches • CDROMs • Modem/router • Printers • Hubs • Server • Peripherals • Desktop Computers 	<ul style="list-style-type: none"> • UTP Cat. 5 cables • UTP Cat.3 cables • RJ 45 modular plug • Learning Manuals • Work Instruction • Hand-outs • Board marker • White board • Schematic diagrams • Charts • Block diagrams • Layout plans • Location Plans • Instrumentation diagrams • Loop diagrams • System Control diagrams • Drawing boards

8. VOCATIONAL TEACHER'S/TRAINER'S QUALIFICATION

Qualification and other requirements for appointment of vocational teachers/trainers on contractual basis should be decided by the State/UT. The suggestive qualifications and minimum competencies for the vocational teacher should be as follows:

S.No.	Qualification	Minimum Competencies	Age Limit
1	Bachelor of Engineering / Technology in Computer Science / Technology OR Master of Computer Science OR Master of Computer Application OR Master of Information Technology OR DOEACC B Level Certificate. It is recommended to have additional qualification such as CCNA, CCP or any other diploma in computer hardware maintenance.	The candidate should have a minimum of 1 year of work experience in the same job role. S/He should be able to communicate in English and local language. S/He should have knowledge of equipment, tools, material, Safety, Health & Hygiene.	18-37 years (as on Jan. 01 (year)) Age relaxation to be provided as per Govt. rules

Vocational Teachers/Trainers form the backbone of Vocational Education being imparted as an integral part of Rashtriya Madhyamik Shiksha Abhiyan (RMSA). They are directly involved in teaching of vocational subjects and also serve as a link between the industry and the schools for arranging industry visits, On-the-Job Training (OJT) and placement.

These guidelines have been prepared with an aim to help and guide the States in engaging quality Vocational Teachers/Trainers in the schools. Various parameters that need to be looked into while engaging the Vocational Teachers/Trainers are mode and procedure of selection of Vocational Teachers/Trainers, Educational Qualifications, Industry Experience, and Certification/Accreditation.

The State may engage Vocational Teachers/Trainers in schools approved under the component of Vocationalisation of Secondary and Higher Secondary Education under RMSA in following ways:

1. Directly as per the prescribed qualifications and industry experience suggested by the PSS Central Institute of Vocational Education (PSSCIVE), NCERT or the respective Sector Skill Council (SSC). **OR**
2. Through accredited Vocational Training Providers accredited under the National Quality Assurance Framework (NQAF*) approved by the National Skill Qualification Committee on 21.07.2016. If the State is engaging Vocational Teachers/Trainers through the Vocational Training Provider (VTP), it should ensure that VTP should have been accredited at NQAF Level 2 or higher.

** The National Quality Assurance Framework (NQAF) provides the benchmarks or quality criteria which the different organisations involved in education and training must meet in order to be accredited by competent bodies to provide government-funded education and training/skills activities. This is applicable to all organizations offering NSQF-compliant qualifications.*

The educational qualifications required for being a Vocational Teacher/Trainer for a particular job role are clearly mentioned in the curriculum for the particular NSQF compliant job role. The State should ensure that teachers / trainers deployed in the schools have relevant technical competencies for the NSQF qualification being delivered. The Vocational Teachers/Trainers preferably should be certified by the concerned Sector Skill Council for the particular Qualification Pack/Job role which he will be teaching. Copies of relevant certificates and/or record of experience of the teacher/trainer in the industry should be kept as record.

To ensure the quality of the Vocational Teachers/Trainers, the State should ensure that a standardized procedure for selection of Vocational Teachers/Trainers is followed. The selection procedure should consist of the following:

- i. Written test for the technical/domain specific knowledge related to the sector;
- ii. Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and
- iii. Practical test/mock test in classroom/workshop/laboratory.

In case of appointment through VTPs, the selection may be done based on the above procedure by a committee having representatives of both the State Government and the VTP.

The State should ensure that the Vocational Teachers/ Trainers who are recruited should undergo induction training of 20 days for understanding the scheme, NSQF framework and Vocational Pedagogy before being deployed in the schools.

The State should ensure that the existing trainers undergo in-service training of 5 days every year to make them aware of the relevant and new techniques/approaches in their sector and understand the latest trends and policy reforms in vocational education.

The Head Master/Principal of the school where the scheme is being implemented should facilitate and ensure that the Vocational Teachers/Trainers:

- Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- Make effective use of learning aids and ICT tools during the classroom sessions;
- Engage students in learning activities, which include a mix of different methodologies, such as project based work, team work, practical and simulation based learning experiences;
- Work with the institution's management to organise skill demonstrations, site visits, on-job trainings, and presentations for students in cooperation with industry, enterprises and other workplaces;
- Identify the weaknesses of students and assist them in up-gradation of competency;
- Cater to different learning styles and level of ability of students;
- Assess the learning needs and abilities, when working with students with different abilities
- Identify any additional support the student may need and help to make special arrangements for that support;
- Provide placement assistance

Assessment and evaluation of Vocational Teachers/Trainers is very critical for making them aware of their performance and for suggesting corrective actions. The States/UTs should ensure that the performance of the Vocational Teachers/Trainers is appraised annually. Performance based appraisal in relation to certain pre-established criteria and objectives should be done periodically to ensure the quality of the Vocational Teachers/Trainers. Following parameters may be considered during the appraisal process:

- Participation in guidance and counselling activities conducted at Institutional, District and State level;
- Adoption of innovative teaching and training methods;
- Improvement in result of vocational students of Class X or Class XII;
- Continuous up-gradation of knowledge and skills related to the vocational pedagogy, communication skills and vocational subject;
- Membership of professional society at District, State, Regional, National and International level;
- Development of teaching-learning materials in the subject area;
- Efforts made in developing linkages with the Industry/Establishments;
- Efforts made towards involving the local community in Vocational Education
- Publication of papers in National and International Journals;
- Organisation of activities for promotion of vocational subjects;
- Involvement in placement of students/student support services.

9. LIST OF CONTRIBUTORS

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