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FOR MH CLASS 12 PREPARATION

Maharashtra Class 12 Syllabus 2027 Field Technician – Computing and Peripherals (NSQF vocational)

EXAM	YEAR	TYPE
MH Class 12	2027	Syllabus

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:
Field Technician Computing and Peripherals

(QUALIFICATION PACK: Ref. Id. ELE/Q4601, NSQF Level 4)

SECTOR: Electronics

Grades XI and XII

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal – 462 002, M.P., India
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Field Technician Computing and Peripherals

Electronics Sector

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Joint Director
PSS Central Institute of Vocational Education, NCERT, Shyamla Hills, Bhopal

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 Education, 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 **Field Technician Computing and Peripherals in Electronics Sector.** 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.

Dinesh Prasad Saklani
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 fulfill the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Education (MoE), 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 fulfill the needs of the society and the world of work. In order to honor its commitment to the nation, the PSSSCIVE 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 course-ware 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 MoE and NCERT for the financial support and cooperation in realising the objective of providing learning outcome based modular curricula and course-ware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Samagra Shiksha* of MoE.

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 course-ware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21st Century.

Deepak Paliwal
Joint Director
PSS Central Institute of Vocational Education

ACKNOWLEDGMENT

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 Education (MoE), 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, MoE, 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 and Deepak D. Shudhalwar, Professor (CSE), PSSCIVE, 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 Deepak Shudhalwar, Professor (CSE) and Head, ICT and Computer Centre, PSSCIVE in development of the curriculum for the employability skills are duly acknowledged.

We are also grateful to the Course Coordinator Deepak D. Shudhalwar, Professor (CSE), Head, ICT and Computer Centre, Department of Engineering and Technology, PSSCIVE, for bringing out this curriculum in the final form.

PSSCIVE Team

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1. COURSE OVERVIEW

Course Title: Field Technician Computing and Peripherals

A Field Technician - Computing & Peripherals is responsible for visiting customer premises to install and carry out repair and maintenance of a desktop computer. The individual carries out installation and troubleshooting of computer peripherals also. The individual may also carry out installation, repair and maintenance of a laptop and relevant peripherals. The individual must be punctual and have the ability to communicate professionally. Reading, writing, problem-solving skills along with good hand-eye co-ordination are other important attributes required in this job role. The individual must be comfortable with traveling to customer premises to perform her/ his duties.

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;
- ✓ Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ✓ Prepare to visit the customer;
- ✓ Visit the customer and assess the computer issue;
- ✓ Explain the action required and costs involved;
- ✓ Comply with the quality and safety standards;
- ✓ Install the desktop computer's hardware and software;
- ✓ Install the desktop computer peripherals;
- ✓ Test the desktop computer and its peripherals;
- ✓ Educate the customer;
- ✓ Identify issues with the desktop computer and peripherals;
- ✓ Carry out repair and replacement activities;
- ✓ Comply with the quality standards;
- ✓ Invoice the customer and take feedback;
- ✓ Communicate effectively at the workplace;
- ✓ Work effectively;
- ✓ Maintain and enhance professional competence;
- ✓ Work in a disciplined and ethical manner;
- ✓ Uphold social diversity at the workplace;
- ✓ Deal with workplace hazards;
- ✓ Apply fire safety practices;
- ✓ Follow emergencies, rescue and first-aid procedures;
- ✓ Effective waste management/recycling practices;
- ✓ Install the laptop;
- ✓ Install the laptop peripherals;
- ✓ Test the laptop and peripherals;
- ✓ Educate the customer;
- ✓ Identify problems with the laptop and its peripherals;
- ✓ Carry out repair and maintenance;
- ✓ Comply with the quality standards;
- ✓ Invoice the customer and take feedback;

COURSE REQUIREMENTS: The learner should have basic knowledge of science. The student learning in science stream in Grades XI and XII may opt this course.

COURSE LEVEL: This course can be taken up at Intermediate level in Grade XI and Grade XII.

COURSE DURATION: Total : 600 hours (Grade XI: 300 hours, Grade XII: 300 hours)

2. SCHEME OF UNITS AND ASSESSMENT

This course is a planned sequence of instructions consisting of Units meant for developing employ-ability and vocational competencies of students of Grade XI and XII opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for **Grade XI** is as follows :

GRADE XI			
	Units	**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory & Practical 100**
Part A	**Employability Skills**		
Unit 1	Communication Skills – III	25	**10**
Unit 2	Self-management Skills – III	25	
Unit 3	Basic ICT Skills – III	20	
Unit 4	Entrepreneurial Skills – III	25	
Unit 5	Green Skills – III	15	
	Total Hours	**110**	**10**
Part B	**Vocational Skills**		
Unit 1	Fundamentals of Computer and Peripherals	30	**40**
Unit 2	Installation and Configuration of Operating Systems	45	
Unit 3	Basic Electronics, Tools and Equipment	30	
Unit 4	Installation of Desktop Computer and Peripherals	60	
	Total Hours	**165**	**40**
Part C	**Practical Work**		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	**10**	**35**
Part D	**Project Work/ Field Visit**		
	Practical File/ Student Portfolio	10	10
	Viva Voce	05	05
	Total	**15**	**15**
	Grand Total	**300**	**100**

The unit-wise distribution of hours and marks for **Grade XII** is as follows:

GRADE XII			
	Units	**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory & Practical 100**
Part A	**Employability Skills**		
Unit 1	Communication Skills – III	25	**10**
Unit 2	Self-management Skills – III	25	
Unit 3	Basic ICT Skills – III	20	
Unit 4	Entrepreneurial Skills – III	25	
Unit 5	Green Skills – III	15	
	Total Hours	**110**	**10**
Part B	**Vocational Skills**		
Unit 1	Repair and Maintenance of Computer and Peripherals	60	**40**
Unit 2	Installation and Configuration of Laptop and Peripherals	45	
Unit 3	Repair and Maintenance of Laptop and Peripherals	30	
Unit 4	Work Ethics, Quality, Health and Safety	30	
	Total Hours	**165**	
Part C	**Practical Work**		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	**10**	**35**
Part D	**Project Work/ Field Visit**		
	Practical File/ Student Portfolio	10	10
	Viva Voce	05	05
	Total	**15**	**15**
	Grand Total	**300**	**100**

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. A sample blue print for the question paper may be as follows:

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)	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, private 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 20 Questions	5x1=5	10x2=20	5x3=15	40

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.

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.

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. 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, the CCE manual of Central Board of Secondary Education (CBSE) or the guidelines issued by the State Boards on the procedure for CCE should be followed by the Institutions

5. UNIT CONTENTS

GRADE XI, Part A: Employability Skills		
Unit No.	**Unit Name**	**Duration in Hours**
Unit 1	Communication Skills – III	25
Unit 2	Self-management Skills – III	25
Unit 3	Basic ICT Skills – III	20
Unit 4	Entrepreneurial Skills – III	25
Unit 5	Green Skills – III	15
	Total	**110**

Unit 1: Communication Skills – III				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25**
1	Demonstrate knowledge of effective communication	• Introduction to communication • Importance of communication • Elements of communication • Perspectives in communication • Effective communication	• Role-play on the communication process, • Group discussion on the importance of communication and factors affecting perspectives in communication, • Classroom discussion on the 7Cs of effective communication (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete), • Chart making on elements of communication.	03
2	Demonstrate verbal communication	• Verbal communication • Public Speaking	• Role play of a phone conversation, • Group exercise on delivering a speech and practicing public speaking	02
3	Demonstrate non-verbal communication	• Importance of non-verbal communication, • Types of non-verbal communication, • Visual communication	• Role plays on non-verbal communication, • Group exercise and discussion on Do's and Don'ts to avoid body language mistakes, • Group activity on methods of communication.	02
4	Use correct pronounciation	• Pronounciation basics, • Speaking poperly, • Phonetics, • Types of sounds	• Group excersises on pronouncing words,	01

5	Demonstratrate the knowledge eof assertive communication style	• Important communication styles, • Assertive communication, • Advantages of assertive communication, • Practicing assertive communication.	• Group discussion on communication styles, • Group discussion on observing and sharing communication styles.	02
6	Demonstrate the knowledge of saying no	• Steps for saying "No" • Connecting words (Conjuctions)	• Group discussion on how to respond, • Group discussion on how to say 'No'	01
7	Identify and use parts of speech in writing	• Capitalisation, • Punctuation, • Basic parts of speech, • Supporting parts of speech	• Group exercises on identifying parts of speech, • Group activity on constructing sentences, • Group exercises on nouns.	02
8	Write sentences and paragraphs	• Parts of a sentence, • Types of object, • Types of sentences, • Paragraph	• Exercises on making sentences, • Activity on active and passive voice, • Assignment on writing different types of sentences.	01
9	Communicate with people	• Geetings, • Introducing self and others	• Role-play on formal and informal greetings, • Role-play on introducing someone, • Practice session and group discussion on greeting different people	01
10	Introduce yourself to others and write about oneself	• Talking about self, • Filling out a form to write about self	• Practicing self-introduction to write about self, • Filling up forms to write about self	01
11	Develop questioning skill	• Main types of questions, • Forming closed and open ended questions	• Exercise on asking different types of questions, • Group activity on framing open ended and close ended questions.	01
12	Communicate information about family to others	• Names of relatives, • Relations	• Practice taking about family, • Role-ply on talking about family members	01
13	Describe habits and routines	• Concept of habits and routines	• Group discussion on habits and routines, • Group activity on describing routines.	01
14	Ask or give	• Asking for directions to place,	• Role-play on asking and giving	01

	directions to others	• Giving directions for a place.	directions, • Identifying symbols used for giving directions.	
			Total Duration in Hours	**20**

Unit 2: Self-management Skills – III				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25**
1.	Identify and analyze own strengths and weaknesses	• Knowing your self, • Identifying strengths and weaknesses, • Difference between interests and abilities.	• Activity on writing aims in life, • Prepare a worksheet on interests and abilities.	02
2.	Demonstrate personal grooming skills	• Guidelines for dressing and grooming,	• Role-play on dressing and grooming standards, • Self-reflection activity on dressing and grooming.	02
3.	Maintain personal hygiene	• Importance of personal hygiene • Three steps to personal hygiene • Essential steps of hand washing	• Role-play on personal hygiene, • Assignment on personal hygiene.	02
4.	Demonstrate the knowledge of working in a team and participating in group activities	• Describe the benefits of teamwork, • Working in a team.	• Assignment on working in a team, • Self-reflection on teamwork.	02
5	Descibe the importance of networking skills	• Benefits of networking skills, • Steps to build networking skills.	• Group exercise on networking in action, • Assignment on networking skills.	01
6	Describe the meaning and importance of self-motivation	• Self-motivation, • Types of motivation, • Qualities of self-motivation.	• Activity on staying motivated, • Assignment on reasons hindering motivation.	02
7	Set SMART goals	• Meaning of goals and purpose of goal-setting, • Setting SMART (Specific, Measureable, Attainable, Realistic and Timebound) goals	• Assignment on setting SMART goals, • Activity on developing long-term and short-term goals using SMART method.	02
8	Apply time management strategies and techniques	• Time management, • Steps for effective time management	• Preparing checklist of daily activities, • Preparing to-do-list.	02
			Total Duration in Hours	**15**

Unit 3: Information and Communication Technology Skills – III				
Sn	**Learning Outcome**	**Theory (08 Hours)**	**Practical (12 Hours)**	**20**
1.	Create a document on the word processor	• Introduction to ICT, • Advantages of using a word processor, • Working with LibreOffice Writer	• Group activity on demonstration and practice of the following: • Creating a new document • Typing text • Saving the text • Opening and saving file in Microsoft word/Libre Office Writer	02
2.	Identify icons on the toolbar	• Standard user interface of LibreOffice Writer • Status bar, • Menu bar, • Tool bar • Making text bold	• Group activity on using basic user interface of LibreOffice Writer, • Group activity on working with Microsoft Word.	02
3.	Save, close, open and print document	• Saving a document, • Closing a document, • Opening an existing document, • Printing a document	• Group activity on perform ing the functions for saving, closing and printing documents in LibreOffice Writer, • Group activity on performing the functions to save, close and print documents.	02
4.	Format text in a document	• Changeing style and size of text • Aligning text, • Cutting, Copying, Pasting text, • Find and replace	• Group activity on formatting text in LibreOffice Writer, • Group activity on formatting text in Microsoft Word	02
5.	Check spelling and grammar in a word document	• Starting s spell checker, • Short-cut menu for spell checker, • Autocorrect spelling.	• Group activity on checking spellings and grammer using LibreOffice Writer, • Group activity on checking spellings and grammer using Microsoft Word	02
6.	Insert lists, tables, pictures, and shapes in a word document	• Inserting bullet list, number list in document, • Inserting Tables in document, • Inserting Pictures in document, • Inserting Shapes in document,	• Practical exercise of inserting lists and tables in LibreOffice Writer	03
7.	Insert header, footer and page number in a word document	• Inserting header, • Inserting footer, • Inserting page number, • Inserting page count	• Practical exercise of inserting header, footer and page numbers in LibreOffice Writer and Microsoft Word.	03
8.	Make changes by using the track	• Tracking option • Manage option	• Group activity on performing track changes in LibreOffice	04

	change option in a word document	• Compare documents	Writer and Microsoft Word	
			Total Duration in Hours	**20**

Unit 4: Entrepreneurial Skills – III

Sn	Learning Outcome	Theory (10 Hours)	Practical (15 Hours)	25
1.	Differentiate between different kinds of businesses	• Introduction to entrepreneurship • Types of business activities – manufacturing, trading and service.	• Role play on different kind of business around us.	03
2.	Describe the significance of entrepreneurial values	• Values of an Entrepreneur, • Case study on qualities of an entrepreneur.	• Role play on qualities of an entrepreneur	03
3.	Describe the attitudinal changes required to become an entrepreneur	• Difference between the attitude of entrepreneur and employee.	• Interviewing employees and entrepreneurs.	03
4.	Describe the importance of thinking like an entrepreneur	• Problems of entrepreneurs • Problem-solving, • Thinking like an entrepreneur to solve problems.	• Group activity on identifying and solving problems	04
5.	Generate business ideas	• The business cycle, • Principles of idea creation, • Generating a business idea, • Case studies.	• Group activity to create business ideas.	04
6.	Describe customer needs and importance of conducting a customer survey	• Understanding customer needs • Conducting a customer survey	• Group activity to conduct a customer survey	04
7.	Create a business plan	• Importance of business planning, • Preparing a business plan, • Principles to follow for growing a business, • Case studies	• Group activity on developing a business plan	04
			Total Duration in Hours	**25**

Unit 5: Green Skills – III

Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	15
1.	Describe the importance of the	• Important sectors of the green economy- Artriculture, Energy	• Group discussion on sectors of green economy,	06

	main sector of the green economy	resources, Constructioin, Fisheries, Forestry, Tourism, Transport, Water Mamagement, Waste Mamagement, Manufacturing, Industry.	• Poster making on various sectors for promoting green economy	
2.	Describe the policies for the green economy	• Policies for a green economy	• Group discussion on initiatives for promoting the green economy, • Writing an essay or short note on initiatives for promoting the green economy.	03
3.	Describe the major green sector/area and the role of various stakeholders in the green economy	• Stakeholders in the green economy	• Group discussion on the role of stakeholders in green economy, • Making solar bulbs.	03
4.	Identify the role of government and private agencies in the green economy	• Role of the government in promoting a green economy, • Role of private agencies in promoting green economy.	• Group discussion on the role of government and private agencies in promoting a green economy. • Preparing posters on green sectors.	03
			Total Duration in Hours	**15**

GRADE XI, Part B: Vocational Skills				
Unit	**Unit Name**	**Theory Hours**	**Practical Hours**	**Total Hours**
Unit 1	Fundamentals of Computer and Peripherals	15	15	30
Unit 2	Installation and Configuration of Operating Systems	15	30	45
Unit 3	Basic Electronics, Tools and Equipment	15	15	30
Unit 4	Installation of Desktop Computer and Peripherals	30	30	60
	Total Duration	**75**	**90**	**165**

Unit 1: Fundametals of Computer and Peripherals				
Sn	**Learning Outcome**	**Theory (15 Hours)**	**Practical (15 Hours)**	**30**
1.	State the role and responsibilities of a Field Technician Computing and Peripherals.	• Size and scope of the Electronic industry and its sub-sectors. • Role and responsibilities of a Field Technician Computing and Peripherals. • Employment opportunities for a Field Technician Computing and Peripherals.	• Identify and name the various Computer Peripherals and basic software • List the Roles and responsibilities of a Field Technician Computing and Peripherals.	06
2.	Describe the Basic Functionality of Computer System	• Computer System and its Functional units, • Block diagram of Computer, • Characteristics and Limitations of Computer, • Computer Hardware and Software, • Classification of Computers – Analog, Digital, Hybrid, • Types of computer – Micro, Mini, Mainframe, Super, • Classification of Computer – Desktop, Laptop, Server, Mobile, • Internal components of Computer – Motherboard, CPU, RAM, Hard Disk Drive (HDD), Solid State Drive (SSD), Power Supply Unit (PSU), Add on cards – Graphics card, Sound card, LAN card	• Draw the block diagram of computer and label its functional units, • Prepare the list of computer hardware and software components, • Identify and name the main components of computer, • Identify the given computer as analog, digital, or hybrid type, • Prepare the list of types of computers with its featurs and capacity, • Identify and name the type of computer, • Identify and name the given internal Components of Computer System.	08
3.	Describe the Input, Output Devices	• Input and Output Devices, • Types of Input Devices, • Text Input Devices – Keyboard, Mouse, Light Pen, Touch Screen, Graphic Tablet, Touchpad, Joystick, • Audio Visual Input Devices – Scanner, Microphone, Digital Camera, Webcam, • Input Card Readers – Smart Card or Chip Reader, • Input-reading Text or Codes – Bar code, QR Code, OMR, MICR, OCR,	• Give the names of 5 Input Devices and 5 Output Devices, • Identify the type of given input device, • Demonstrate to connect and disconnect input device to the computer, • Demonstrate to check the input device for proper functionality, • Demonstrate to scan the bar code and QR code and verify it for the desired output, • Identify and name the given	08

		• Input sensors – Remote control, Biometric sensor, • Types of output devices – Soft copy, Hard copy, Sound output devices, • Soft copy output device – Monitor, Projector, • Hard copy output devices – Printer, Plotter • Sound output devices – speaker, headphone.	output device, • Prepare the list of soft and hard copy output devices, • Demonstrate to connect and disconnect output device to the computer, • Demonstrate to check the output device for proper functionality, • Prepare the list of sound output devices.	
4.	Describe the Storage and Peripheral Devices	• Digital data storage devices, • Capacity and measuring unit of storage devices, • Types of secondary storage devices – Magnetic, Optical, Flash, Cloud storage, • Magnetic storage devices – HDD, SSD, Zip Disk, Tape, • Optical storage devices – CD, DVD, Blu-ray disk, • Flash memory devices – USB flash drive, Secure Digital (SD) card, • Cloud storage – Dropbox, Google drive, • Peripheral Devices – Printer, Scanner, Speakers, Mike, Digital camera, projecor.	• Give the names of 5 storage devices, • Prepare a table giving the storage capacity of various storage device, • Identify and name the given storage device, • Demonstrate to connect and disconnect storage devices to the computer, • Demonstrate to check for proper functionality of the storage devices, • Demonstrate to connect and disconnect the peripheral devices to the computer system.	08
			Total Duration in Hours	**30**

Unit 2: Installation and Configuration of Operating Systems				
Sn	**Learning Outcome**	**Theory (15 Hours)**	**Practical (30 Hours)**	**45**
1.	Describe the functioins of operating system	• Need of operating system (OS), • Features of operating system, • Structure of operating system, • Components of operating system – Kernel, Shell, • Functions of operating system, • Types of operating system, • Examples of operating system, • Classification of operating system – Single user, Multiuser, Multi-tasking, Multiprocessing, Time sharing, Batch processing.	• Observe the booting process of Computer and note the instructions on the screen, • Observe the functions of OS while working on the computer, • Prepare the table enlisting the features and versions for various OS, • Demonstrate to perform the general tasks in OS.	07

2.	Install Windows operating sytem	• Windows OS – versions and features, • System requirement to install Windows 10/11 OS, • Types of Windows 10/11 installation – Clean installation and Upgrade installation, • Configuring the boot order, • Disk management, • Creating patition in Windows, • Procedure for clean installation of Windows 10/11, • Procedure for upgrade installation of Windows 10/11, • Finalisation of Windows 10/11 installation.	• List the features, versions and system requirement of Windows OS, • Identify the configuration on the given system and suggest the suitable version of Windows that can be installed on it, • Demonstrate to configure boot order before installation of Windows, • Demonstrate to create patition in Windows, • Demonstrate to install Windows 10/11 on a new computer, • Demonstrate to upgrade install Windows 10/11.	08
3.	Configure Windows OS and install peripherals	• Windows 10/11 Desktop, • Procedure for configuration of Windows 10/11 OS for various settings using Control Panel - Appearance and Personalization, Clock, Language, and Region, Ease of Access, Hardware and Sound, Network and Internet, Programs, System and Security, User Accounts. • Procedure for installation of system utilities and application software in Windows 10/11, • Procedure for installation of Peripherals – Printer, Scanner and other peripheral devices using device driver	• Demostrate to perform various settings and configuration os Windows desktop, • Demonstrate to configure Windows OS for settings using Control Panel - Appearance and Personalization, Clock, Language, and Region, Ease of Access, Hardware and Sound, Network and Internet, Programs, System and Security, User Accounts. • Demonstrate to install system utilities and application software in Windows 10/11, • Demonstrate to install printer, scanner and other peripherals using device driver.	10
4.	Install Linux operating sytem	• Linux OS – distributions, features, and system requirement, • Types of Linux installation – clean installation, dual booting, installation using virtual box, • Creating Ubuntu Linux bootable disk, • Booting from USB Flash drive, • Drive management, • Procedure for installation Ubuntu Linux, • Procedure for installation of	• List the features of various distributions of Linux OS, • Demonstrate to create Ubuntu Linux bootable disk, • Demonstrate to configure boot order for installation of Linux, • Booting from USB Flash drive, • Demonstrate to install Ubuntu Linux on a DOS computer, • Demonstrate to install Ubuntu Linux on Windows computer for dual booting, • Demonstrate to install Ubuntu	10

		Ubuntu Linux in dual booting, • Procedure for installing Ubuntu Linux in Virtual Box	Linux on Virtual Box, • Demonstrate to install printer, scanner and other peripherals.	
5.	Configure Linux OS, and install peripherals	• Post installation tasks in Ubuntu Linux, • Customize Ubuntu desktop interface, • Basic commands in Linux, • Commands for update, upgrade, install and remove packages, • Install the package using software center, • Downloading and installing debian packages, • Connecting to the Internet, • Procedure for installation of Printer, Scanner and other peripherals in Ubuntu Linux.	• Demonstrate to install the relevant software and utilities in Ubuntu Linux, • Demonstrate to customize Ubuntu desktop interface, • Demonstrate to execute basic Linux commands, • Demonstrate to update, upgrade, install and remove packages using commands, • Demonstrate to Install package using software center, • Demonstrate to download and install debian packages, • Demonstrate to connect to the Internet.	10
			Total Duration in Hours	**45**

Unit 3: Basic Electronics, Tools and Equipment				
Sn	**Learning Outcome**	**Theory (15 Hours)**	**Practical (15 Hours)**	**30**
1.	Describe the Basic Concepts of Electronics	• Introduction to Electricity and Electronics, • Electronic circuits and their components, • Electronic components – active and passive, • Active components – Diode, Transistor, Integrated Circuit, LED, Power source, Solenoid • Passcive components – Transformer, Resistor, Capacitor, Inductor, Fuse	• Switch on/ off the electrical appliances such as electric fan, computer and determine the presence of electricity. • Identify electronic circuits and their components • Identify and name the electronic components embedded on PCB, • Categorise the given components as active or passive	06
2.	Describe the electronic circuit components	• Types of electronic circuits – Analog and Digital, • Basic building blocks of analog circuit – Series and Parallel connection, • Basic Building Blocks of Digital Circuit – Logic Gates, Microprocessor/ Chip, Microcontroller • Integrated Circuits – Digital,	• Identify and list the basic building blocks of analog circuit, • Identify and list the basic building blocks of digital circuit, • Read the Voltage, Current, and Power ratings of various components, • List the voltage requirement for the components – USB port,	10

		Analog, Mixed, General Integrated Circuits, • Voltage and Power requirement for hardware, • Power Supply Unit (PSU) and colour codes of PSU cables.	CPU fan, Motherboard, Graphic Card, CPU, • List the voltages of different color cables of PSU.	
3.	Describe the functions of various electrical and mechanical parts and modules in a computer system	• Functions of various electrical and mechanical parts and modules in a computer system, • Precautions to be taken to protect from electrical hazards.	• List the various electrical and mechanical parts and modules in a computer system, • Demonstrate the use of relevant PPE such as an ESD wrist strap to protect from Electrostatic Discharge (ESD) and other electrical hazards.	06
4.	Demonstrate the use of Tools, Equipment and Measuring Instruments	• Common tools – Screwdriver, Soldering iron • Measuring instruments – Phase Tester, Earth Tester, Watt Meter, Energy Meter, Multi-meter, • Measurement of AC, DC Voltage and Current using Multi-meter and Clamp Meter, • Safey practices to use Tools, Equipment and Measuring Instruments.	• Demonstrate to use Tools, • Measure electrical quantities and test electronic component, • Calculate the Current flowing through Resistance, • Calculate the Current flowing in live wire using Clamp meter, • Measure the given AC, DC Voltage and Current by using Multi-meter and Clamp meter.	08
			Total Duration in Hours	**30**

Unit 4: Installation of Desktop Computer and Peripherals				
Sn	**Learning Outcome**	**Theory (30 Hours)**	**Practical (30 Hours)**	**60**
1.	Install the Motherboard	• Functions of Motherboard Components, • Motherboards – Form factors, Ports and connectors, Slots and Sockets on Motherboard, • Connections of various components on Motherboard, • Procedure for installation of Motherboard. • Importance of CMOS Battery in Computer, • Features and Specifications of CMOS Battery, • Procedure for installation and un-installation of CMOS Battery on Motherboard	• Identify and name the diffierent components of Motherboard, • Identify and name the type of Motherboards, • Identify and name the ports and connectors on Motherboard, • Identify and name the slots and sockets on Motherboard, • Demonstrate to connect and disconnect various components and Install the Motherboard, • Identify the slots of CMOS battery on the Motherboard,	10

			• Demonstrate to install and uninstall the CMOS battery on Motherboard.	
2.	Install the CPU or Processor on the Motherboard	• CPU or processor architecure, • Features and working of CPU, • Generations and types of CPU, • Specifications of CPU, • Speed, Form Factor and performance of CPU, • Procedure for installation of CPU and CPU Fan.	• Watch the video to understand the working of CPU & CPU Fan, • Identify the types of CPU, • Prepare the specifications of CPU and understand the Speed and Form Factor of CPU, • Demostrate to install the CPU and CPU Fan on Motherboard.	06
3.	Install the RAM modules on Motherboard	• Importance of RAM in computer, • Features, types and specifications of RAM modules, • Examples of RAM modules, • Procedure for installation of RAM modules on Motherboard in Desktop computer.	• List the Features, types and specifications of RAM modules, • Identify the RAM modules, • Identify the slots of RAM modules on the Motherboard, • Demonstrate to install the RAM modules on Motherboard.	06
4.	Install the Add on cards – Graphics card, Sound card and LAN card on the Motherboard	• Importance of Add on cards - Graphics card, Sound card and LAN card in Computer, • Features and specifications of Graphics card, Sound card and LAN card in Computer, • Procedure for installation of Graphics card, Sound card and LAN card on the Motherboard, • Installation of software utilities of the relevant card.	• List the features and specifications of Graphics card, Sound card and LAN card in Computer, • Identify the slots of Graphics card, Sound card and LAN card in Computer on the Motherboard, • Demonstrate to install the Graphics card, Sound card and LAN card in Computer, • Install the software of card.	06
5.	Install the Power Supply Unit (PSU)	• Power Supply Unit – Need of PSU in Computer, • Working and operation of PSU, • Features and specifications of PSU, • Connection of PSU, • Procedure for installation of PSU in Computer.	• List the Features and specifications of PSU, • Watch the video and observe the working of PSU, • Identify the connectors of PSU, • Demonstrate to install and uninstall the PSU in Computer.	04
6.	Install the Disk Drive	• Disk drives – CD/ DVD drive, HDD, SSD • Working and operation of disk drives, • Features, speed and specifications of disk drives,	• List the features and specifications of disk drives, • Watch the video and observe the working of disk drive, • Identify the connectors of disk drives,	06

		• Connectors of disk drives, • Procedure for installation of disk drives in Computer.	• Demonstrate to install and uninstall the disk drives.	
7.	Install Monitor	• Computer Monitor, • Types of Monitor, • Specifications of Monitor, • Power requiment for Monitor, • Procedure for installation of Monitor.	• List the Features and Specifications of Monitor, • Watch the video and observe the working of Monitor, • Group Activity to Install and Uninstall the Monitor.	06
8.	Install the Peripherals	• Computer Peripherals – Printer, Scanner, Speakers • Specifications and Types of Peripherals, • Power requiment for Peripherals, • Connectors and Slots for Peripherals, • Procedure for installation of Computer Peripherals – Printer, Scanner, Speakers	• Identify and name the Peripherals, • List the Features and Specifications of Peripherals, • Watch the video and observe the working of Peripherals, • Identify the Connectors and Slots of Peripherals, • Group Activity to Install and Uninstall the Computer Peripherals.	06
9.	Assemble and Dismenlte the Desktop Computer	• Computer parts and peripherals and their compatibility, • Precautions for assembling the desktop computer and peripherals, • Tools for assembling the desktop computer and peripherals, • Process of assembling various computer parts to form a workable computer system, • Testing the functionality of each part of computer and peripherals, • Process of assembling various parts of peripherals, • Process of dis-assembling various computer parts into separate parts.	• Arrange the computer parts and peripherals for assembling a desktop computer and peripherals, • Check the compatibility of various parts of computer and peripherals, • Select the appropriate tools for assembling a desktop computer and peripherals, • Demonstrate to assemble the desktop computer, • Demonstrate to test the functionality of computer after assembling, • Demonstrate to assemble the peripherals, test the functionality after assembling, • Demonstrate to dis-assemble the desktop computer and peripherals.	10
			Total Duration in Hours	**60**

GRADE XII, Part A: Employability Skills

Unit No.	Unit Name	Duration (Hrs.)
Unit 1	Communication Skills – IV	25
Unit 2	Self-management Skills – IV	25
Unit 3	Basic ICT Skills – IV	20
Unit 4	Entrepreneurial Skills – IV	25
Unit 5	Green Skills – IV	15
	Total Hours	**110**

Unit 1: Communication Skills – IV

Sn	Learning Outcome	Theory (10 Hours)	Practical (15 Hours)	25
1.	Demonstrate active listening skills	• Active listening -listening skill and stages of active listening, • Overcoming barriers to active listening.	• Group discussion on the factors affecting active listening, • Preparing posters of steps for active listening, • Role-play on negative effects of not listening actively.	08
2.	Identify the parts of speech	• Parts of speech – using capitals, punctuation, basic parts of speech, supporting parts of speech, • Supporting parts of speech.	• Group practice on identifying parts of speech. • Group practice on constructing sentences.	08

3.	Write sentences	• Writing simple sentence,
		• Writing complex sentence,
		• Types of object,
		• Types of sentences
		  • Active and Passive sentences,
		  • Statement/Declarative sentence,
		  • Question/Interrogative sentence,
		  • Emotion/Reaction or Exclamatory sentence,
		  • Order or Imperative sentence.
			• Group work on writing sentences and paragraphs,
			• Group work on practicing writing sentences in active or passive voice,
			• Group activity on writing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative)
				09

			Total Duration in Hours	**25**

Unit 2: Self-management Skills – IV

Sn	Learning Outcome	Theory (10 Hours)	Practical (15 Hours)	25
1.	Describe the various factors influencing motivation and positive attitude	• Motivation and positive attitude, • Intrinsic and extrinsic motivation • Positive attitude – ways to	• Role Play on avoiding stressful situation, • Activity on listing negative situations and ways to turn it	09

		maintain positive attitude, • Stress and stress management - ways to manage stress	positive.	
2.	Demonstrate the knowledge of becoming oriented	• Becoming result oriented, • Goal setting – examples of result-oriented goals.	• Group activity on listing sim in life.	08

3.	Describe the importance of self-awareness and the basic personality traits, types and disorders	• Steps towards self-awareness,
		• Personality and basic personality traits,
		• Common personality disorders-
		  • Suspicious,
		  • Emotional and impulsive,
		  • Anxious,
		• Steps to overcome personality disorders
			• Group discussion on self awareness.	08

			Total Duration in Hours	**25**

Unit 3: Information and Communication Technology Skills – IV				
Sn	**Learning Outcome**	**Theory (06 Hours)**	**Practical (14 Hours)**	**20**
1.	Identify the components of a spreadsheet application	• Getting started with spreadsheet – types of a spreadsheet, components of a worksheet, • Steps tp start LibreOffice Calc, • Components of worksheet	• Group activity on identifying components of spreadsheet in LibreOffice Calc	02
2.	Perform basic operations in a spreadsheet	• Opening workbook and entering data – types of data, steps to enter data, editing and deleting data in a cell, • Selecting multiple cells, • Saving the spreadsheet in various formats, • Closing the spreadsheet, • Opening the spreadsheet, • Printing the spreadsheet.	• Group activity on working with data on LibreOffice Calc	03
3.	Demonstrate the knowledge of working with data and formatting text	• Using a spreadsheet for addition – adding value directly, adding by using cell address, using a mouse to select values in a formula, using sum function, copying and moving formula, • Need to format cell and content, • Changing text style and font size, • Aligning text in a cell, • Highlighting text.	• Group activity on formatting a spreadsheet in LibreOffice Calc • Group activity on performing basic calculations in LibreOffice Calc.	02

4.	Demonstrate the knowledge of using advanced features in spreadsheet	• Sorting data, • Filtering data, • Protecting spreadsheet with password	• Group activity on sorting data in LibreOffice Calc	03
5.	Make use of the software used for making slide presentations	• Steps to start LibreOffice Impress, • Adding text to a slide presentation	• Group practice on working with LibreOffice Impress tools	02
6.	Demonstrate the knowledge to open, close and save slide presentations	• Open, Close, Save and Print a slide presentation	• Group activity on saving, closing and opening a presentation in LibreOffice Impress	01
7.	Demonstrate the operations related to slides and texts in the presentation	• Working with slides and text in a presentation- adding slides to a presentation, deleting slides, adding and formatting text, highlighting text, aligning text, changing text colour	• Group practice on working with font styles and types in LibreOffice Impress.	04
8.	Demonstrate the use of advanced features in a presentation	• Advanced features used in the presentation, • Inserting shapes in the presentation, • Inserting clipart and images in the presentation, • Changing slide layout.	• Group activity on changing slide layout in LibreOffice Impress.	03
			Total Duration in Hours	**20**

Unit 4: Entrepreneurial Skills – IV				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25**
1.	Describe the concept of entrepreneurship and the types and roles and functions entrepreneur	• Entrepreneurship and entrepreneur, • Characteristics of entrepreneurship, • Entrepreneurship-art and science, • Qualities of a successful entrepreneur, • Types of entrepreneurs, • Roles and functions of an entrepreneur, • What motivates an entrepreneur? • Identifying opportunities and risk-taking, • Startups.	• Group discussion on the topic "An entrepreneur is not born but created". • Conducting a classroom quiz on various aspects of entrepreneurship. •	10
2.	Identify the barriers to entrepreneurship	• Barriers to entrepreneurship, • Environmental barriers, • Faulty business plan, • Personal barriers	• Group discussion about "What we fear about entrepreneurship" • Activity on taking an interview	05

			of an entrepreneur.	
3.	Identify the attitude that make entrepreneur successful	• Entrepreneurial attitude.	• Group activity on identifying entrepreneurial attitude.	05
4.	Demonstrate the knowledge of entrepreneurial attitude and competencies	• Entrepreneurial competencies • Decisiveness, • Initiative • Interpersonal skills-positive attitude, stress management • Perseverance • Organisational skills- time management, goal setting, efficiency, managing quality.	• Playing games, such as "Who am I". • Brainstorming a business ideas • Group practice on "Best out of Waste" • Group discussion on the topic of "Let's grow together" • Group activity on listing stress and methods to deal with it like Yoga, deep breathing exercise.	05
			Total Duration in Hours	**25**

Unit 5: Green Skills – IV				
Sn	**Learning Outcome**	**Theory (05 Hours)**	**Practical (10 Hours)**	**15**

1.	Identify the benefits of the green jobs	• Green jobs
		• Benefits of green jobs
		• Green jobs in different sectors:
		  • Agriculture
		  • Transportation
		  • Water conservation
		  • Solar and wind energy
		  • Eco-tourism
		  • Building and construction
		  • Solid waste management
		  • Appropriate technology
			• Group discussion on the importance of green job,
			•
				08

2	State the importance of green jobs	• Importance of green jobs in
		  • Limiting greenhouse gas emissions,
		  • Minimizing waste and pollution,
		  • Protecting and restoring ecosystems,
		  • Adapting to the effects of climate change
			• Preparing posters on green jobs,
			• Group activity on tree plantation.
				07

			Total Duration in Hours	**15**

GRADE XII, Part B: Vocational Skills

Unit	Unit Name	Theory Hours	Practical Hours	Total Hours
Unit 1	Repair and Maintenance of Desktop Computer and Peripherals	30	30	60
Unit 2	Installation and Configuration of Laptop and Peripherals	15	30	45
Unit 3	Repair and Maintenance of Laptop and Peripherals	15	15	30
Unit 4	Work Ethics, Quality, Health and Safety	15	15	30
	Total Duration	**75**	**90**	**165**

Unit 1: Repair and Maintenance of Desktop Computer and Peripherals

Sn	Learning Outcome	Theory (15 Hours)	Practical (30 Hours)	45
1.	Explain the importance of carrying out repair and maintenance activities within the Turnaround Time (TAT) given to the customer.	• Established methods to detect problems with a computer system and peripherals. • Estimated time required to complete the various repair and maintenance activities, • Concept of Turnaround Time (TAT) given to the customer.	• Give the list of established methods to detect problems with a computer system and peripherals, • Prepare the chart showing the estimated time required to complete the various repair and maintenance activities	03
2.	Identify different types of hardware and software issues encountered with a desktop computer and its peripherals.	• Types of faults in the computer system and peripherals, • Dignosis of faults in the computer and peripherals, • Different types of hardware issues encountered with a desktop computer and its peripherals, • Different types of software issues encountered with a computer and its peripherals.	• List the different types of hardware issues encountered with a desktop computer and its peripherals, • List the different types of software issues encountered with a desktop computer and its peripherals.	10
3.	Describe the process of disassembling and reassembling various desktop computer components and peripherals.	• Requirement of disassembling and reassembling the process of desktop computer components and peripherals to carry out repair and maintenance, • Process of disassembling various desktop computer components, • Process of reassembling various desktop computer components, • Process of disassembling the	• Illustrate the process of disassembling various desktop computer components to carry out repair and maintenance, • Illustrate the process of reassembling various desktop computer components to carry out repair and maintenance, • Illustrate the process of disassembling the various peripherals to carry out repair and maintenance, • Illustrate the process of	08

		various peripherals, • Process of reassembling the various peripherals,	reassembling the various peripherals to carry out repair and maintenance.	
4.	Demonstrate the process of carrying out repair and maintenance of a desktop computer and its peripherals.	• Standard process of carrying out repair and maintenance of a desktop peripherals, • Preventive maintenace process of desktop peripherals,	• Demonstrate the process of repair and maintenance of a desktop peripherals, • Demonstrate the process of preventive maintenace process of desktop peripherals,	12
5.	Test a desktop computer and its peripherals for the correct functioning after repair and maintenance.	• Importance of testing, • Idle functioning of various parts and components of desktop computer and peripherals, • Testing process and parameters of various parts and components of desktop computer and peripherals,	• List the testing process and parameters of various parts and components of desktop computer and peripherals, • Demonstrate the functioning of repaired or replaced parts and components of desktop computer and peripherals	08
6.	Prepare a work-report, customer feedback and invoice	• Process of preparing the invoice and processing the payment, • Procedure and formats of filing work-report and invoice, • Importance of customer feedback, • Procedure and formats of filing customer feedback.	• Prepare a sample work-report and invoice as per the given format, • Illustrate to take the customer feedback to improve the quality of service.	04
			Total Duration in Hours	**45**

Unit 2: Installation and Configuration of Laptop and Peripherals				
Sn	**Learning Outcome**	**Theory (15 Hours)**	**Practical (30 Hours)**	**45**
1.	Describe the process of setting up a laptop for use.	• Features and specifications of laptop, • External components of laptop, • Internal components of laptop, • Process of docking a laptop, • Various peripherals compatible with a laptop.	• List the features and specifications of laptop, • Identify and name the various external components of laptop, • Identify and name the various internal components of laptop, • Identify and name the various peripherals compatible with a laptop.	05
2.	Install the Motherboard in laptop	• Laptop Motherboard – Form Factors, Ports and connectors, slots and sockets, connections of various components,	• Identify and name the diffierent components of laptop motherboard, • Identify and name the type of	08

		• Procedure for installation of Motherboard in laptop, • Features and specifications of CMOS Battery, • Procedure for installation and un-installation of CMOS battery on Motherboard	motherboards used in laptop, • Demonstrate to connect and disconnect various components and install the motherboard in laptop, • Demonstrate to install and uninstall the CMOS battery on motherboard of laptop.	
3.	Install the CPU or Processor on the Motherboard	• Speed, form factor and performance of CPU in laptop, • Procedure for installation of CPU and CPU fan in laptop.	• Prepare the specifications of CPU mentioning the speed and form factor of CPU in laptop, • Demonstrate to install the CPU and CPU fan on motherboard of laptop.	04
4.	Install the RAM Modules on the Motherboard	• Types and specifications of RAM modules used in laptop, • Procedure for installation of RAM modules in laptop.	• List the features, types and specifications of RAM modules used in laptop, • Identify slots of RAM modules, • Demonstrate to install the RAM modules on motherboard.	04
5.	Install the Graphics Card and Sound Card in laptop	• Features and specifications of Add on cards – Graphics card, Sound card and LAN card used in laptop, • Procedure for installation of Add on cards – Graphics card, Sound card and LAN card in laptop,	• List the features and specifications of Add on cards – Graphics card, Sound card and LAN card used in laptop, • Demonstrate to install the Add on cards – Graphics card, Sound card and LAN card in laptop,	04
6.	Install the Disk Drive	• Disk Drives – CD/ DVD Drive, Hard Disk Drive, SSD, • Features, speed and specifications of HDD and SSD used in laptop, • Procedure for installation of HDD and SSD in laptop.	• List the features and specifications of Disk Drives, • Demonstrate to install and uninstall the HDD and SSD in the laptop.	06
7.	Install the Peripherals	• Computer peripherals – Printer, Scanner, Speakers • Specifications and types of peripherals, • Connectors and slots for Peripherals in laptop, • Procedure for installation of Computer Peripherals – Printer, Scanner, Speakers in laptop.	• Identify the connectors of peripherals and appropriate slots to be connected in the laptop, • Demonstrate to install and uninstall the peripherals in laptop.	06
8.	Assemble and	• Laptop parts and peripherals	• Arrange the laptop parts and	08

	dismenlte the laptop	and their compatibility, • Precautions for laptop assembly, • Tools for laptop assembly, • Procedure for laptop assembly and dis-assembly, • Testing the functionality of each part of laptop, • Confirm and completion of laptop assembly, • Procedure to dismantle the laptop into separate parts.	peripherals for assembly, • Check the compatibility of various parts of laptop, • Select the appropriate tools for laptop assembly, • Group activity to assemble the laptop, • Demonstrate to test the functionality of laptop after assembly, • Demonstrate to dismantle the laptop into separate parts.	
			Total Duration in Hours	**45**

Unit 3: Repair and Maintenace of Laptop and Peripherals				
Sn	**Learning Outcome**	**Theory (15 Hours)**	**Practical (15 Hours)**	**30**
1.	Identify different types of hardware and software issues encountered in laptop and its peripherals.	• Common issues encountered with the internal components of a laptop, • Types of faults in the laptop and its peripherals, • Dignosis of faults in the laptop and its peripherals, • Different types of hardware issues encountered in a laptop and its peripherals, • Different types of software issues encountered in a laptop and its peripherals	• List the common issues encountered with the internal components of a laptop, • List the different types of hardware issues encountered with a desktop computer and its peripherals, • List the different types of software issues encountered with a desktop computer and its peripherals, • Demonstrate to conduct the necessary tests on a laptop to identify various software and hardware related issues.	05
2.	Demonstrate the process of carrying out repair and maintenance of laptop and its peripherals.	• Standard process of carrying out repair and maintenance of laptop and its peripherals, • Preventive maintenace process of laptop and its peripherals,	• Demonstrate the process of repair and maintenance of laptop and its peripherals, • Demonstrate the process of preventive maintenace process of laptop and its peripherals,	15
3.	Test a laptop and its peripherals for the correct functioning after repair and maintenance	• Importance of testing, • Idle functioning of various parts and components of laptop and its peripherals, • Testing process and parameters of various parts	• List the testing process and parameters of various parts and components of laptop and its peripherals, • Demonstrate the functioning of repaired or replaced parts and	06

		and components of laptop and its peripherals,	components of laptop and its peripherals	
4.	Prepare a work-report, customer feedback and invoice	• Process of preparing the invoice and processing the payment, • Procedure and formats of filing work-report and invoice, • Importance of customer feedback, • Procedure and formats of filing customer feedback.	• Prepare a sample work-report and invoice as per the given format, • Illustrate to take the customer feedback to improve the quality of service.	04
			Total Duration in Hours	**30**

Unit 4: Work Ethics, Quality, Health and Safety				
Sn	**Learning Outcome**	**Theory (15 Hours)**	**Practical (15 Hours)**	**30**
1.	Describe the process of achieving optimum productivity and quality	• Importance of cleanliness, air and water quality in the workplace, • Importance of time management to meet daily target, • Importance of Quality in delivery of work, • Organization's policies and procedures and work ethics	• Group activity to keep work area clean and tidy, • Prepare a to do list and demonstrate to complete work effectively in time to meet daily target, • Check the quality of work with the expected standards, • Group activity to comply with organization's policies and procedures	08
2.	Explain the importance of implementing health and safety procedures	• Organisation safety and health policy, • ESD precautions, • Types of accident injury or hazard	• Group acticity to observe and follow organisation safety guidelines, • Demonstrate to observe ESD precautions, • Identify and report any accident injury or hazard	08
3.	Demonstrate the process of organizing waste management and recycling	• Recyclable/non-recyclable and hazardous wastes, • Methods of recycling as well as repairing and reusing, electronic components, • Different waste categories –dry, wet, recyclable, non-recyclable and single use plastic items, • Waste management and waste disposal procedures,	• Identify and segregate recyclable/non-recyclable and hazardous wastes, • Group activity to dispose waste as per the procedures, • Group activity to recyclie, repair and reuse electronic components, • Participate in waste management and waste disposal workshops organised	08

		• Effect of greening of jobs	at workplace	
4.	Explain the importance of conserving resources	• Efficient utilisation of material and water, • Prevalent energy efficient devices, • Common electrical problems, • Cleaning of tools, machines and equipment • Common practices of conserving electricity	• Group activity to demonstrate efficient utilisation of resources, material and water, • Make the list of equivalent energy efficient devices, • Perform routine cleaning of tools, machines and equipment • Demonstrate the common practices of conserving electricity.	06
			Total Duration in Hours	**30**

6. ORGANISATION OF FIELD VISITS and OJT

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. During summer or winter vacation, students can undergo on-the-job training in nearby industry or work place. Visit a Software Development Company and observe the following:

Location, Site, Computer systems and peripheral devices, Software, Documentation Process, Computer and Peripherals Maintenance. After completing on-the-job training students should be able to :

1. Explain the functions of a computer and its peripherals.
2. List the preliminary tasks involved in the repair and maintenance of a computer and its peripherals.
3. Demonstrate how to perform preliminary checks on a computer and its peripherals.
4. Perform steps to inspect the computer and its peripherals to identify defective modules/ components.
5. Perform repair and maintenance activities as per the Service Level Agreement (SLA).
6. Perform steps to test the functioning of computers and its peripherals after repair.
7. Communicate product and service-related information to the customer.
8. Employ appropriate practices to interact and coordinate with supervisor and colleagues.
9. Perform assigned work within the turnaround time and as per the defined quality standards.
10. Demonstrate how to maintain a healthy, safe and secure working environment.

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.

Classroom Aids	Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop
Tools	Machine tools for servicing the computer, Printed Circuit Board (PCB), Rulers, T-square, Multi-tester, Multi-meter – analog & digital, Pliers, Cutters, Screw drivers, Goggles, Gloves, Protractor, Antistatic wrist wrap, Masks, Flashlights, Sharp pointed tweezers, Mirror (inspection), Soldering iron, De-soldering pump, glue,

	magnifying glass, tester, adhesive and soldering equipment
Equipment	CRO, Function generator, UPS, Power supply, Power meter, Signal detector, Hubs, Switches, Modem/ router, Computers, Laptops, Peripherals – Laser, Printers, Ink Jet Printers, Dot Matrix Printers, Scanners, Screw Driver, Cables, Network switch etc. Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher, first aid kit, fire extinguishers and warning signs.
Material	Electronic Components – Active and Passive, ICs, PCB, CD / DVDs, UTP Cat. 5E/ 6 cables, RJ 45 modular plug, Board marker, Schematic diagrams, Charts, Block diagrams, Layout plans, Location Plans, Instrumentation diagrams, Loop diagrams, System Control diagrams, Drawing board
Software	Windows 10, 11, Linux Ubuntu Latest version, Antivirus software

8. 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:

Qualification	Minimum Competencies	Age Limit
Bachelor's degree in appropriate branch of Engineering/ Technology **OR** Master of Computer Application (MCA) **OR** Master of Science (Computer Science/IT) ***Desirable:*** Knowledge and skills of Installation, Repair and Maintenance of Computer Hardware and Software.	The candidate should have minimum 1 year of work experience. Good communication skills in English and local language.	18-37 years (as on Jan. 01 (year)) Age relaxation to be provided as per Govt. rules

Note – The qualifications for vocational teachers mentioned above is suggestive and not prescriptive. The States/ UTs can make modifications in the qualifications for appointment of vocational teachers/ trainers as per their requirement through a committe appointed by the competent authority in the State/ UT Directorate/ Department of School Education.

Vocational Teachers/Trainers form the backbone of Vocational Education being imparted as an integral part of Samagra Shiksha. 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:

1. Written test for the technical/domain specific knowledge related to the sector;
2. Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and
3. 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 counseling 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, 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.

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