

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE : BAMBOO GROWER

(QUALIFICATION PACK: REF. ID. AGR/Q6101)

SECTOR: AGRICULTURE

Classes 9 and 10


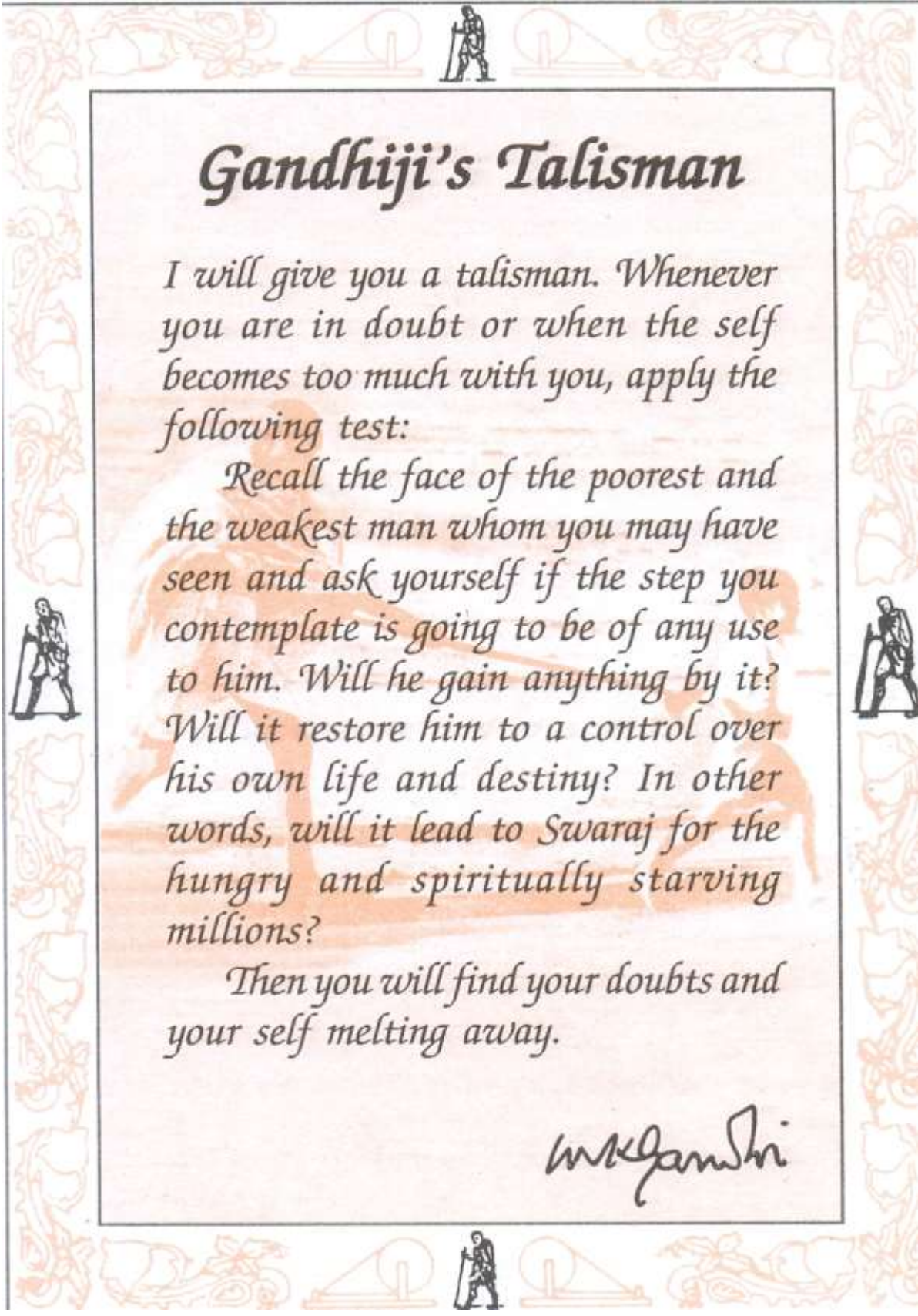


PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

(a constituent unit of NCERT, under MHRD, Government of India)


Shyamla Hills, Bhopal- 462 013, M.P., India

<http://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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Agriculture –Bamboo Grower

January, 2020

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FOREWORD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), a constituent unit of National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based vocational curriculum and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Vocationalisation of Education under *Samagra Shiksha*. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Samagra Shiksha* of Ministry of Human Resource Development (MHRD), Govt. of India. The main purpose of the learning outcome based vocational curriculum is to bring about improvement in teaching-learning process and working competencies through learning outcomes embedded in the vocational subject.

It is a matter of great pleasure to introduce this learning outcome based vocational curriculum as part of the vocational training package for the job role Bamboo Grower (AGR/Q6101). The curriculum has been developed for the higher 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 Education
Research and 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 in 2012 with the aim 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. The scheme was subsumed in *Samagra Shiksha* in 2018 along with other schemes of school education. For spearheading the Vocationalisation Education, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop learning outcome based vocational curriculum, 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 needs 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 vocational curriculum 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 50 job roles in various sectors, besides the curricula developed for 100 job roles.

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, 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 vocational curriculum and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Samagra Shiksha* of Ministry of Human Resource Development (MHRD), Government of India.

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*

ACKNOWLEDGEMENTS

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 Samagra Shiksha 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, National Council of Educational Research & Training (NCERT) for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of *Samagra Shiksha*, MHRD, National Skill Development Agency (NSDA) and National Skill Development Corporation (NSDC) and Agriculture Skill Council of India (ASCI) for their support and cooperation.

We are grateful to the experts for their earnest efforts and contributions in the development of this learning outcome based vocational curriculum. Their names are acknowledged in the list of contributors.

The contributions made by Dr. Vinay Swarup Mehrotra, Professor and Head, Department of Agriculture and Animal Husbandry and Curriculum Development and Evaluation Centre (CDEC), Dr. Vipin Kumar Jain, Associate Professor and Head, Department of Humanities, Science, Education and Research and Dr. Dipak D. Shudhalwar, Associate Professor and Head, Department of Engineering and Technology, PSSCIVE in development of the curriculum for the employability skills are duly acknowledged.

The assistance provided by Mr. Jivan Koli, Computer Operator, PSSCIVE and Mr. Rajesh Yadav, Computer Operator (Contract), PSSCIVE in layout, design and composing of the material is duly acknowledged.

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1. COURSE OVERVIEW

COURSE TITLE: AGRICULTURE – BAMBOO GROWER

A Bamboo Grower is responsible for cultivation of Bamboo on a given piece of land. He/she begins with procurement of seed material and end up with the sale of farm produce in the market. Therefore, he/she is also responsible for harvesting and post-harvesting of the Bamboo.

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 of entrepreneurial skills and abilities;
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection
- Demonstrate the knowledge about preparing and managing nursery for Bamboo.
- Identify the planting material for Bamboo cultivation
- Prepare the layout and soil for transplanting of Bamboo farming
- Demonstrate the knowledge about soil fertility and nutrient management in Bamboo growing
- Describe the method of Integrated pests and diseases management in Bamboo growing
- Define the method of harvest and Post harvest management in Bamboo growing
- Basic farm management including crop management, record keeping, financial management and interface with the market.
- Describe the Knowledge about the different activities related to farming such as seed selection, seed procurement, planting, weeding, pest management, irrigation, post-harvest activities
- Identify the Maintain clean and efficient workplace & Render appropriate emergency procedures.

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

COURSE DURATION: 400 hrs

Class 9 : 200 hrs

Class 10 : 200 hrs

Total : 400 hrs

2. SCHEME OF UNITS

The unit-wise distribution of hours and marks for Class 9 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		
1.	Communication Skills-I	20	10
2.	Self-management Skills-I	10	
3.	Information and Communication Technology Skills-I	20	
4.	Entrepreneurial Skills-I	15	
5.	Green Skills-I	10	
	Total	75	10
Part B	Vocational Skills		
6.	Introduction to Bamboo	30	30
7.	Bamboo Nursery Techniques	35	
8.	Bamboo Plantation Establishment	30	
	Total	95	30
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
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	05	10
	Grand 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		
	Communication Skills – II	20	10
	Self-management Skills – II	10	
	Information and Communication Technology Skills – II	20	
	Entrepreneurial Skills – II	15	
	Green Skills – II	10	
	Total	75	10
Part B	Vocational Skills		
	Bamboo Plantation Management	30	30
	Harvesting and Post-Harvest Technology	35	
	Marketing of Bamboo	30	
	Total	95	30
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
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	05	10
	Grand Total	200	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, 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

Maximum Marks: 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)	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)

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

CLASS 9

Part A: Employability Skills

S.No.	Units	Duration (Hrs)
1.	Communication Skills - I	20
2.	Self-management Skills - I	10
3.	Information and Communication Technology Skills-I	20
4.	Entrepreneurial Skills - I	15
5.	Green Skills - I	10
	Total	75

Unit 1: Communication Skills – I			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication <ul style="list-style-type: none"> • Verbal • Non-verbal • Visual 	1. Writing pros and cons of written, verbal and non-verbal communication 2. Listing do's and don'ts for avoiding common body language mistakes	05
2. Identify elements of communication cycle	1. Meaning of communication 2. Importance of communication skills 3. Elements of communication cycle– <ul style="list-style-type: none"> • Sender, • Ideas, • Encoding, • Communication channel, • Receiver, • Decoding, and • Feedback 	1. Draw a diagram of communication cycle 2. Role plays on communication process related to the sector/job role	05
3. Identify the factors affecting our perspectives in communication	1. Perspectives in communication 2. Factors affecting perspectives in communication <ul style="list-style-type: none"> • Visual perception • Language 	1. Group discussion on factors affecting perspectives in communication 2. Sharing of experiences on factors affecting perspectives	05

	<ul style="list-style-type: none"> • Past experience • Prejudices • Feelings • Environment 	3. Sharing experiences on factors affecting communication at workplace	
4. Demonstrate the knowledge of basic writing skills	1. Writing skills related to the following: <ul style="list-style-type: none"> • Phrases • Kinds of sentences • Parts of sentence • Parts of speech • Use of articles • Construction of a paragraph 	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject	05

Unit 2: Self-management Skills – I

Learning Outcome	Theory	Practical	Duration (10 Hrs)
1. Describe the meaning and importance of self-management	1. Meaning of self-management 2. Positive results of self-management 3. Self-management skills	1. Identification of self-management skills 2. Strength and weakness analysis	05
2. Identify the factors that helps in building self-confidence	1. Factors that help in building self-confidence, social, cultural, and physical factors 2. 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.	1. Role play exercises on building self-confidence 2. Use of positive metaphors/ words 3. Positive stroking on wakeup and before going bed 4. Helping others and working for community	05

Unit 3: Information and Communication Technology Skills – I

Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Describe the role of Information and Communication Technology (ICT) in day-to-day life and workplace	1. Introduction to ICT 2. Role and importance of ICT in personal life and at workplace 3. ICT in our daily life (examples) 4. ICT tools - Mobile, tab, radio, TV, email, etc.	1. Discussion on the role and importance of ICT in personal life and at workplace. 2. Preparing posters / collages for showing the role of ICT at workplace	04

2. Identify components of basic computer system and their functions	<ol style="list-style-type: none"> 1. Computer system - Central Processing Unit (CPU), memory, motherboard, storage devices 2. Hardware and software of a computer system 3. Role and functions of Random Access Memory (RAM) and Read Only Memory (ROM) 4. Role and functions of Central Processing Unit 5. Procedure for starting and shutting down a computer 	<ol style="list-style-type: none"> 1. Connecting the cables and peripherals to the Central Processing Unit 2. Starting and shutting down a computer 3. Group discussion on the various aspects of hardware and software 	07
3. Demonstrate use of various components and peripherals of computer system	<ol style="list-style-type: none"> 1. Peripherals devices and their uses – mouse, keyboard, scanner, webcam, etc. of a computer system 	<ol style="list-style-type: none"> 1. Identification of various parts and peripherals of a computer 2. Demonstration and practice on the use of mouse 3. Demonstration and practice on the use of keyboard 4. Demonstration of the uses of printers, webcams, scanner and other peripheral devices 5. Drawing diagram of computer system and labelling it 	05
4. Demonstrate basic computer skills	<ol style="list-style-type: none"> 1. Primary operations on a computer system – input, process, storage, output, communication networking, etc. 	<ol style="list-style-type: none"> 1. Identification of the various input and output units and explanation of their purposes 	04

Unit 4: Entrepreneurial Skills - I			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. Identify various types of business activities	1. Types of businesses – service, manufacturing, hybrid 2. Types of businesses found in our community 3. Business activities around us	1. Prepare posters of business activities found in cities/villages, using pictures 2. Discuss the various types of activities, generally adopted by small businesses in a local community 3. Best out of waste 4. Costing of the product made out of waste 5. Selling of items made from waste materials 6. Prepare list of businesses that provides goods and services in exchange for money 7.	09
2. Demonstrate the knowledge of distinguishing characteristics of entrepreneurship	1. Meaning of entrepreneurship development 2. Distinguishing characteristics of entrepreneurship 3. Role and rewards of entrepreneurship	1. Prepare charts showing advantages of entrepreneurship over wages 2. Group discussions on role and features of entrepreneurship 3. Lectures/presentations by entrepreneurs on their experiences and success stories 4. Identify core skills of successful entrepreneur	06

Unit 5: Green Skills - I			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
1. Demonstrated the knowledge of the factors influencing natural	1. Introduction to environment, 2. Relationship between society and environment, ecosystem and factors	1. Group discussion on hazards of deteriorating environment 2. Prepare posters	05

resource conservation	causing imbalance 3. Natural resource conservation 4. Environment protection and conservation	showing environment conservation 3. Discussion on various factors that influence our environment	
2. Describe the importance of green economy and green skills	1. Definition of green economy 2. Importance of green economy	1. Discussion on the benefits of green skills and importance of green economy 2. Prepare a Poster showing the importance of green economy with the help of newspaper/ magazine cuttings	05
Total	35	40	75

Part B: Vocational Skills

S.No.	Units	Duration (Hrs)
1.	Introduction to Bamboo	30
2.	Establishing a Bamboo Nursery	35
3.	Bamboo Plantation and Management	30
	Total	95

Unit 1: Introduction to Bamboo			
Learning Outcome	Theory (15 hrs)	Practical (15 hrs)	Duration (30 Hrs)
1. Describe bamboo and its benefits	1. Bamboo in tradition and culture 2. Bamboo handcraft and other items <ul style="list-style-type: none"> Furniture Bamboo art and craft Woven bamboo products (a) Baskets (b) Bags (c) Mats Musical instruments Bamboo pens Bamboo vases Bamboo ornaments 3. Social and economic	1. Group discussion on the economic social, environmental, cultural and health benefits of bamboo 2. Visit state bamboo agriculture development agency or state bamboo mission office 3. Make poster, flyers and brochures related to various aspects of bamboo	

Unit 1: Introduction to Bamboo			
Learning Outcome	Theory (15 hrs)	Practical (15 hrs)	Duration (30 Hrs)
	benefits of bamboo and rattan i.Social benefits ii.Economic benefits iii.Environmental benefits 4. Uses of bamboo in construction and infrastructure development- house construction, public infrastructure, bamboo flooring, bamboo fencing, scaffolding, boat making, bridges and walkways 5. Other uses of bamboo- paper making, utensils, bamboo straws and tooth brushes, food, bamboo rice, medicinal uses of bamboo, bamboo as fuel, bamboo housing, bamboo panel and boards etc.		15
2. Describe the fundamental parts of bamboo	1. Morphology – rhizome, roots, culms, branches, leaves, seeds 2. Anatomy of bamboo – culm anatomy, leaf anatomy 3. Bamboo flowering and seed production 4. Bamboo flowering and regeneration 5. Bamboo species and their utilization 6. Major bamboo producing States/ Union territories in India	1. Visit to an agricultural farm to study the anatomy of bamboos and identify the various species 2. Label the diagram as given in study material 3. Take photographs of different bamboo. Identify their botanical and common names	15

Unit 2: Establishing a Bamboo Nursery			
Learning Outcome	Theory (15 hrs)	Practical (20 hrs)	Duration (35 Hrs)
1. Describe the preparation of bamboo nursery	1. Types of nurseries 2. Steps for establishing bamboo nursery 3. Key site selection factors 4. Nursery layout and design 5. Tools and equipment for nursery set up 6. Fencing and protection of nursery 7. Inputs for nursery operation 8. Precaution for nursery bed	1. Visit bamboo nursery and identify various species of bamboo	10
2. Describe propagation in bamboo	1. Sexual propagation 2. Asexual propagation 3. Propagation techniques 4. Advantages and disadvantages of propagation methods 5. Basic conditions for successful bamboo propagation	1. Visit a nearby bamboo farm/plantation or nursery and practice the various methods of bamboo propagation 2. Demonstration of selection of rhizome, branches and culms as source of propagules for vegetative propagation and explain their role in detail	10
3. Preparing bamboo nursery using seeds	1. Seed collection 2. Sowing in polythene tubes or polybags 3. Nursery bed preparation 4. Sowing 5. Germination period 6. Irrigation 7. Weeding 8. Transplanting	1. Visit to a bamboo farm to identify the different tools, equipment and materials used for bamboo production 2. Preparing potting media	5
4. Describe the care and management of nursery plants	1. Regular maintenance practices 2. Planning and scheduling nursery activities 3. Application of manures and fertilizers	1. Visit to a bamboo nursery for care and management of nursery plants	5

	4. Shading and staking 5. Pests and diseases control 6. Rodent control		
5. Describe the post nursery operations	1. Shade transition 2. Watering plants 3. Grading standards for planting stocks 4. Packaging materials and precautions 5. Packaging and dispatching procedure 6. Transportation to the planting site 7. Record maintenance	1. Visit to bamboo nursery to discuss the post nursery operations practices 2. Visit a bamboo plantation and collect information about record maintenance	5

Unit 3: Bamboo Plantation and Management			
Learning Outcome	Theory (15 hrs)	Practical (15 hrs)	Duration (30 Hrs)
1. Describe the establishment of bamboo plantation	1. Selection of suitable species based on agro-climatic condition 2. Selection of suitable site 3. Preparation of plantation site 4. Preparation of bunds and trenches 5. Time and spacing for plants raised in nursery 6. Manures and fertilizers – farm yard manure, vermicompost, neem cake, etc. 7. Irrigation management 8. Intercultural operations 9. Harvesting bamboo for timber production	1. Visit local bamboo plantation 2. Campaigning to raise awareness about the importance of bamboo	15
2. Describe the culm management of bamboo	1. Culm rehabilitation 2. Sanitation cutting 3. Management of defective culms <ul style="list-style-type: none"> Broken 	1. Visit to a bamboo plantation to study the rehabilitation plan and procedures adopted by the farmers	

Unit 3: Bamboo Plantation and Management			
Learning Outcome	Theory (15 hrs)	Practical (15 hrs)	Duration (30 Hrs)
	<ul style="list-style-type: none"> • Dead and dying • Crooked • Stunted • Diseased 4. Removal of dead and decayed culms 5. Dieses management 6. Safety practices in culms rehabilitation		10
3. Maintenance and protection of bamboo	1. Schedule of maintenance activities 2. Workplace safety precautions for bamboo field workers 3. Farm maintenance and protection practices	1. Collect pictures of pests and discuss strategies of management 2. Demonstrate the procedure of maintaining bamboo plantation	5

CLASS 10

Part A - Employability Skills

S.No.	Units	Duration (Hrs)
1.	Communication Skills – II	20
2.	Self-management Skills - II	10
3.	Information and Communication Technology Skills – II	20
4.	Entrepreneurial Skills – II	15
5.	Green Skills - II	10
	Total	75

Unit 1: Communication Skills - II			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication <ul style="list-style-type: none"> • Verbal • Non-verbal • Visual 	1. Writing pros and cons of written, verbal and non-verbal communication 2. Listing do's and don'ts for avoiding common body	05

		language mistakes	
2. Provide descriptive and specific feedback	1. Communication cycle and importance of feedback 2. Meaning and importance of feedback 3. Descriptive feedback - written comments or conversations 4. Specific and non-specific feedback	1. Constructing sentences for providing descriptive and specific feedback	03
3. Apply measures to overcome barriers in communication	1. Barriers to effective communication – types and factors 2. Measures to overcome barriers in effective communication	1. Enlisting barriers to effective communication 2. Applying measures to overcome barriers in communication	04
4. Apply principles of communication	1. Principles of effective communication 2. 7 Cs of effective communication	1. Constructing sentences that convey all facts required by the receiver 2. Expressing in a manner that shows respect to the receiver of the message 3. Exercises and games on applying 7Cs of effective communication	03
5. Demonstrate basic writing skills	2. 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 	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject	05

Unit 2: Self-management Skills - II			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
1. Apply stress management techniques	1. Meaning and importance of stress management 2. Stress management techniques – physical exercise, yoga, meditation 3. Enjoying, going to vacations and holidays with family and friends 4. Taking nature walks	1. Exercises on stress management techniques – yoga, meditation, physical exercises 2. Preparing a write-up on an essay on experiences during a holiday trip	06
3. Demonstrate the ability to work independently	1. Importance of the ability to work independently 2. Describe the types of self-awareness 3. Describe the meaning of self-motivation and self-regulation	1. Demonstration on working independently 2. goals 3. Planning of an activity 4. Executing tasks in a specific period, with no help or directives 5. Demonstration on the qualities required for working independently	04

Unit 3: Information and Communication Technology Skills– II			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Distinguish between different operating systems	1. Classes of operating systems 2. Menu, icons and task bar on the desktop 3. File concept, file operations, file organization, directory structures, and file-system structures 4. Creating and managing files and folders	1. Identification of task bar, icons, menu, etc. 2. Demonstration and practicing of creating, renaming and deleting files and folders, saving files in folders and sub-folders, restoring files and folders from recycle bin	17
2. Apply basic skills for care and maintenance of computer	1. Importance and need of care and maintenance of computer <ul style="list-style-type: none"> Cleaning computer components Preparing maintenance 	1. Demonstration of the procedures to be followed for cleaning, care and maintenance of hardware and software	03

	<p>schedule</p> <ul style="list-style-type: none"> • Protecting computer against viruses • Scanning and cleaning viruses and removing SPAM files, temporary files and folders 		
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Unit 4: Entrepreneurial Skills - II			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. List the characteristics of successful entrepreneur	<ol style="list-style-type: none"> 1. Entrepreneurship and society 2. Qualities and functions of an entrepreneur 3. Role and importance of an entrepreneur 4. Myth about entrepreneurship 5. Entrepreneurship as a career option 	<ol style="list-style-type: none"> 1. Writing a note on entrepreneurship as career option 2. Collecting success stories of first generation and local entrepreneurs 3. Listing the entrepreneurial qualities – analysis of strength and weaknesses 4. Group discussion of self-qualities that students feel are needed to become successful entrepreneur 5. Collect information and related data for a business 6. Make a plan in team for setting up a business 	15

Unit 5: Green Skills - II			
Learning Outcome	Theory	Practical	Duration (10 hrs)
1. Demonstrate the knowledge of importance, problems and solutions related to sustainable development	<ol style="list-style-type: none"> 1. Definition of sustainable development 2. Importance of sustainable development 3. Problems related to sustainable development 	<ol style="list-style-type: none"> 1. Identify the problem related to sustainable development in the community 2. Group discussion on the importance of respecting and conserving indigenous knowledge and cultural heritage 3. Discussion on the responsibilities and 	10

		benefits of environmental citizenship, including the conservation and protection of environmental values 4. Preparing models on rain water harvesting, drip / sprinkler irrigation, vermin-compost, solar energy, solar cooker, etc.	
Total	38	37	75

CLASS 10

Part B–Vocational Skills

S. No.	Units	Duration (Hrs)
1.	Bamboo Plantation and Maintenance	30
2.	Harvesting and Management of Bamboo	35
3.	Marketing of Bamboo	30
	Total	95

Unit 1: Bamboo Plantation and Maintenance			
Learning Outcome	Theory (15 hrs)	Practical (15 hrs)	Duration (30 hrs)
1. Describe the cultivation practices for improving soil quality	1. Weeding 2. Irrigation 3. Fertilizer application 4. Mulching 5. Constructing fire-lines 6. Replacing dead plants 7. Eliminating unwanted, old and decaying culms in bamboo cultivation	1. Visit to a bamboo plantation to observe different methods of Irrigation, weeding, mulching, fire-line construction and removal of old and rotting culms 2. Visit to a bamboo plantation farm for fertilizer application	10
2. Control the insects-pests and diseases	1. Major insect-pests of bamboo <ul style="list-style-type: none"> • Bamboo termites • Aphids • Bamboo mealy bug • Scale • Beetles 	1. Visit to a local bamboo plantation to identify insect-pests (bamboo termites, aphids, bamboo mealy bug, termites, scale, beetles) 2. Discussion with the bamboo farmer	20

Unit 1: Bamboo Plantation and Maintenance			
Learning Outcome	Theory (15 hrs)	Practical (15 hrs)	Duration (30 hrs)
	2. Major diseases of bamboo: <ul style="list-style-type: none"> • Bamboo blight • Branch die-back • Witches 'broom • Leaf rust • Thread blight • Leaf spot • Foliage blight • Rhizome root rot 	3. Observation of infected plant in the nursery	

Unit 2: Harvesting and Management of Bamboo			
Learning Outcome	Theory (15 hrs)	Practical (20 hrs)	Duration (35 hrs)
1. Describe pre-harvesting activities	1. Computation of culm sizes using metric system 2. Harvestable culms 3. Time and season of harvest 4. Harvesting procedure of bamboo culms 5. Maturity indicators 6. Harvesting plan 7. Farm record keeping 8. Stacking and storage 9. Grading and sizing	1. Visit to local bamboo plantation 2. Record observations in a local bamboo plantation	10
2. Demonstrate harvesting operation	1. Assessing the maturity of culms 2. Timing of harvest 3. Harvesting techniques adopted in bamboo plantation 4. Culms felling 5. Cutting rules 6. Tools and equipment 7. Characteristics of harvestable culms 8. Characteristics of harvestable shoots 9. Preparation of harvested culms	1. Visit to local bamboo plantation during the harvesting season, to understand the tools used, and gather information about harvesting techniques employed in the plantation 2. Visit a bamboo plantation to gather information about the various tools and equipment used in the bamboo harvesting process, and understand their roles in ensuring efficient and sustainable	10

Unit 2: Harvesting and Management of Bamboo			
Learning Outcome	Theory (15 hrs)	Practical (20 hrs)	Duration (35 hrs)
		bamboo harvesting	
3. Post-harvesting activities	1. Bamboo product requirements 2. Procedure for handling harvested culms and shoots 3. Drying and seasoning of bamboo culms 4. Mold prevention 5. Preservation 6. Non-chemical methods 7. Preservation using chemicals	1. Local visit to bamboo plantation for observation of culm cutting and preservation methods	15

Unit 3: Marketing of Bamboo			
Learning Outcome	Theory (10 hrs)	Practical (20 hrs)	Duration (30 Hrs)
1. Describe the policies and regulations for bamboo marketing	1. Introduction to bamboo marketing 2. Bamboo production and sustainable development 3. National transit pass system- bamboo 4. Types of businesses 5. Overall marketing strategies for bamboo products 6. Regulatory framework for bamboo marketing <ul style="list-style-type: none"> • Environmental regulations • Health and safety standards • Trade and export regulations • Intellectual property and branding • Fair Trade and ethical marketing • Packaging and waste management • Product labelling and certifications 	1. Visit to a local bamboo plantation to observe and learn about the different types of businesses involved in bamboo cultivation and their operations 2. Visit to agencies promoting bamboo and gain insights into their work	10

Unit 3: Marketing of Bamboo			
Learning Outcome	Theory (10 hrs)	Practical (20 hrs)	Duration (30 Hrs)
	<ul style="list-style-type: none"> Advertising and marketing regulations Local regulations 7. Government schemes and subsidies in relation to bamboo growers		
2. Describe marketing functionaries and strategies	1. Marketing functionaries for bamboo products 2. Marketing and branding agencies 3. Logistics and transporters 4. Certifying bodies and regulators 5. Marketing channels 6. Marketing strategies 7. Major challenges in the bamboo sector	1. Making a presentation on marketing strategies of bamboo 2. Case study on local bamboo growers	15
3. Describe the various institutions and organizations involved in the promotion and marketing of bamboo	1. National bamboo mission 2. Other institutions	1. Group discussion on the role and functions of agencies/ institutions involved in bamboo marketing and promotion 2. Visit to nearby institutions involved in promotion and marketing of bamboo	05

6. ORGANISATION OF FIELD VISITS/ON-THE-JOB TRAINING

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. Teachers and students should visit a Bamboo Farm and observe the following:

1. Layout and area under cultivation
2. Name of species grown
3. Number of crops raised annually
4. Total production of particular bamboo grown annually
5. Marketing and sale of bamboo
6. Manpower engaged
7. Total expenditure of growing and maintaining bamboo plantation
8. Total annual income

9. Profit/Loss (Annual)

On-the-job training of at least 80 hours is to be organised by the Institution to provide hands on training to the students.

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.

1. Garden Hand Tools
2. Round Scrapping Knife
3. Scrapping Knife
4. Double edged cleaning knife
5. Chisel edged cleaning knife
6. Indian Foldable knife
7. Indian Splitting knife
8. Garden/Digging Fork
9. Bow hand drill
10. Hand Drill
11. Powered Hand drill
12. Poly bags (different sizes)
13. Plug trays
14. Pruners
15. Rabbiting Spade
16. Secateurs
17. Shovels and Specialty Spades
27. Sprinkler Irrigation Unit
28. Drip Irrigation Unit
29. Dutch Hand Hoe
30. Trowels

8. VOCATIONAL TEACHER'S/TRAINER'S QUALIFICATION AND GUIDELINES

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
Post-graduation in Agroforestry /Horticulture/Agriculture from a recognized Institute /University, with at least 1-year work/ teaching	Effective communication skills (oral and written)	18-37 years (as on Jan. 01 (year). Age relaxation to be provided as per

experience	Basic computing skills.	Govt. rules.
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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 the following ways:

(i) 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 (ii) 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 organizations 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:

- a) Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- b) Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- c) Make effective use of learning aids and ICT tools during the classroom sessions;
- d) 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;
- e) Work with the institution's management to organize skill demonstrations, site visits, on-job trainings, and presentations for students in cooperation with industry, enterprises and other workplaces;
- f) Identify the weaknesses of students and assist them in upgradation of competency;
- g) Cater to different learning styles and level of ability of students;
- h) Assess the learning needs and abilities, when working with students with different abilities
- i) Identify any additional support the student may need and help to make special arrangements for that support;
- j) 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:

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

9. LIST OF CONTRIBUTORS

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