

Blue Print
STD-X Subject Code: 98

Name of Subject: Assistant plumber -General (QP 0102)

Unit wise Marks Distribution

Sr.No	Unit	Knowledge			Understanding			Application			Total Marks	Total Marks With Option
		Objectives	Short Answer	Long Answer	Objectives	Short Answer	Long Answer	Objectives	Short Answer	Long Answer		
a	Part- 'A'											
1	Communication skills-II					3(1)		1(1)		4(1)	5	8
2	Self-management skills- II		3(1)								3	3
3	Information and communication technology skills-II						4(1)	1(1)	3(1)		5	8
4	Entrepreneurial skills- II					3(1)		1(1)		4(1)	4	8
5	Green skills- II	1(1)			1(1)			1(1)			3	3
b	Part- 'B'											
1	Basic building construction		3(1)		1(1)		6(1)	1(1)		4(1)	9	15
2	Pipes – cutting, threading, joining and testing of pipelines.	1(1)	3(1)	4(1)	1(2)	3(1)	4(1)	1(2)	3(1)	6(1)	19	28
3	Plumbing and sanitary fixtures			4(1)		3(1)	6(1)	1(1)		4(1)	14	18
4	Maintaining healthy safe and secure work environment	1(1)	3(1)				4(1)	1(1)		6(1)	8	15
5	Optimum utilization of resources	1(1)			1(1)	3(1)	4(1)	1(2)	3(1)		10	14
	No of Question	4	4	2	5	5	6	11	3	6		
	Total Marks	4	12	8	5	15	28	11	9	28		
	Marks with options	24			48			48			80	120

*Figures in bracket indicate number of questions and figures outside bracket indicate total marks for the question.

EVALUATION SCHEME
For March-2025 and on words Examination
Subject Code: 98
STD: X

Name of course: Assistant plumber -General (QP 0102)

Time - 3 Hrs.

Max Marks -80

Sr. No.	Method of Assessment	Weightage of Marks	Evaluator
1	Theory Paper (Written)	30 Marks (80 Marks converted 30 Marks)	School / State Board
2	Practical Exam	30 Marks	Certified Assessor/State Board
3	Term Work (Journal)	10 Mark	School Instructor / Trainer
4	Project Work	10 Mark	School Instructor / Trainer
5	Oral / Viva Vocu	10 Mark	School Instructor / Certified Assessor
6	Direct Observation	10 Mark	School Instructor / Certified Assessor
	Total Marks	100 Marks	

A)Unit-wise Distribution of Marks

Chapter No.	Topic / unit	Marks without option	Marks with option
1.	Communication skills-II	5	8
2.	Self-management skills- II	3	3
3.	Information and communication technology skills-II	5	8
4.	Entrepreneurial skills- II	4	8
5.	Green skills- II	3	3
6.	Basic building construction	9	15
7.	Pipes – cutting, threading, joining and testing of pipelines.	19	28
8.	Plumbing and sanitary fixtures	14	18
9.	Maintaining healthy safe and secure work environment	8	15
10.	Optimum utilization of resources	10	14
Total		80	120

2] Practical Exam:

Practical Time	3 Hours
Practical subject	As per Assistant plumber -General syllabus
Any one practical should be given from the text book by lot system to each group / individual.	
Total Marks of Practical	• 30 Marks

3] Term Work (Journal):

Term Work (Journal)	Journal maintained by the students during the academic year.
Term Work (Journal) Subject	as per Assistant plumber -General syllabus
Total Marks	10 Marks

4] Project Work:

<ul style="list-style-type: none">The project work given in syllabus is only for guideline.Candidate, with approval from the Instructor / Trainer, may choose any one project and prepare it.He has full liberty to prepare any useful project other than the mentioned projects.He may write a visit report about any nearest Industry and their product.One project should be compulsory for each student or a group of maximum 4 students.	
• Total Marks	• 10 Marks

5] Oral/Viva vocu:

10 Marks

6] Direct Observation:

10 Marks

A) Question Wise Distribution of Marks.

Sr. No	Types of Questions	Marks	Marks with option
1	Objectives (1 Mark)	20	20
2	Short Answer Type (3 Marks)	24	36
3	Long Answer Type (4 Marks)	24	40
4	Long Answer Type (6 Marks)	12	24
	Total Marks	80	120

B) Object wise Distribution of marks

Sr. No	Objective	Marks	Percentage	Marks with Option
1	Knowledge	16	20	24
2	Understanding	36	45	48
3	Application	28	35	48
	Total	80	100	120

STD: X
Question Paper Pattern for Theory Papers
Name of course: Assistant plumber -General (QP 0102) (98)

Time -3 Hrs.

Max Marks -80

Notes: 1. All questions are compulsory.
2. Draw diagrams wherever necessary.

Q. No. 1.A) Select the correct alternative and rewrite the sentence / Fill in the Blanks 5

1. Basic building construction
a)..... b) C) d)
2. Pipes – cutting, threading, joining and testing of pipelines
a)..... b) C) d)
3. Communication skills-II
a)..... b) C) d)
4. Maintaining healthy safe and secure work environment
a)..... b) C) d)
5. Optimum utilization of resources
a)..... b) C) d)

B) Match the following pairs. 5

- | | |
|---|----|
| 1. Basic building construction | A) |
| 2. Entrepreneurial skills- II | B) |
| 3. Plumbing and sanitary fixtures | C) |
| 4. Green skills- II | D) |
| 5. Pipes – cutting, threading, joining and testing of pipelines | E) |

C) State the following statement is true or false. 5

1. Maintaining healthy safe and secure work environment
2. Information and communication technology skills-II
3. Pipes – cutting, threading, joining and testing of pipelines
4. Green skills- II
5. Optimum utilization of resources

D) Answer the following questions in ONE sentence. 5

1. Pipes – cutting, threading, joining and testing of pipelines
2. Green skills- II
3. Optimum utilization of resources
4. Optimum utilization of resources
5. Pipes – cutting, threading, joining and testing of pipelines

- Q. No. 2) Answer the following questions in short. (Any four) 12
1. Information and communication technology skills-II
 2. Pipes – cutting, threading, joining and testing of pipelines
 3. Basic building construction
 4. Plumbing and sanitary fixtures
 5. Communication skills-II
 6. Maintaining healthy safe and secure work environment
- Q. No. 3) Answer the following questions in short. (Any four) 12
1. Entrepreneurial skills- II
 2. Pipes – cutting, threading, joining and testing of pipelines
 3. Optimum utilization of resources
 4. Self-management skills- II
 5. Optimum utilization of resources
 6. Pipes – cutting, threading, joining and testing of pipelines
- Q. No. 4) Answer the following questions in brief. (Any three) 12
1. Entrepreneurial skills- II
 2. Basic building construction
 3. Communication skills-II
 4. Pipes – cutting, threading, joining and testing of pipelines
 5. Plumbing and sanitary fixtures
- Q. No. 5) Answer the following questions in brief. (Any three) 12
1. Pipes – cutting, threading, joining and testing of pipelines
 2. Maintaining healthy safe and secure work environment
 3. Information and communication technology skills-II
 4. Plumbing and sanitary fixtures
 5. Optimum utilization of resources
- Q. No. 6) A) Answer the following questions in brief. (Any One) 6
1. Basic building construction
 2. Maintaining healthy safe and secure work environment
- B) Answer the following questions in brief. (Any One) 6
1. Pipes – cutting, threading, joining and testing of pipelines
 2. Plumbing and sanitary fixtures

Blue Print

STD-X Subject Code: X8

Name of Subject: Junior Field Technician Home Appliances (QP 3117)

Unit wise Marks Distribution

BLUE PRINT

Sr.No	Unit	Knowledge			Understanding			Application			Total Marks	Total Marks With Option
		Objectives	Short Answer	Long Answer	Objectives	Short Answer	Long Answer	Objectives	Short Answer	Long Answer		
a	Part- 'A'											
1	Communication skills-II				1(1)	3(1)				4(1)	4	8
2	Self-management skills- II				1(1)				3(1)		4	4
3	Information and communication technology skills-II				1(1)		4(1)		3(1)		5	8
4	Entrepreneurial skills- II	1(1)	3(1)		1(1)			1(1)			3	6
5	Green skills- II						4(1)				4	4
b	Part- 'B'											
1	Installation and repair and maintenance of electric Iron.	1(2)		4(1)	1(1)	3 (1)	6(1)	1(1)	3(1)	4(1)	17	24
2	Installation and repair and maintenance of Fan.	1(2)	3(1)	4(1)	1(1)	3(1)	4(1) 6(1)	1(1)	3(1)	6(1)	23	33
3	Installation and repair and maintenance of Cooler.	1(2)	3(1)		1(2)	3(1)	4(1)	1(2)	3(1)	4(2) 6(1)	20	33
	No of Question	7	3	2	8	4	6	5	5	6		
	Total Marks	7	9	8	8	12	28	5	15	28		
	Marks with options	24			48			48			80	120

*Figures in bracket indicate number of questions and figures outside bracket indicate total marks for the question.

EVALUATION SCHEME
For March-2025 and on words Examination
Subject Code: X8
STD: X

Name of course: Junior Field Technician Home Appliances (QP 3117)

Time - 3 Hrs.

Max Marks -80

Scheme of Examination:

Sr. No.	Method of Assessment	Weightage of Marks	Evaluator
1	Theory Paper (Written)	30 Marks (80 Marks converted 30 Marks)	School / State Board
2	Practical Exam	30 Marks	Certified Assessor
3	Term Work (Journal)	10 Mark	School Instructor / Trainer
4	Project Work	10 Mark	School Instructor / Trainer
5	Oral / Viva Vocu	10 Mark	School Instructor / Certified Assessor
6	Direct Observation	10 Mark	School Instructor / Certified Assessor
	Total Marks	100 Marks	

A)Unit-wise Distribution of Marks

Chapter No.	Topic / unit	Marks without option	Marks with option
1.	Communication skills-II	4	8
2.	Self-management skills- II	4	4
3.	Information and communication technology skills-II	5	8
4.	Entrepreneurial skills- II	3	6
5.	Green skills- II	4	4
6.	Installation and repair and maintenance of electric Iron.	17	24
7.	Installation and repair and maintenance of Fan.	23	33
8.	Installation and repair and maintenance of Cooler.	20	33
Total		80	120

2] Practical Exam:

Practical Time	3 Hours
Practical subject	As per Junior Field Technician Home appliances syllabus
Any one practical should be given from the text book by lot system to each group / individual.	
Total Marks of Practical	• 30 Marks

3] Term Work (Journal):

Term Work (Journal)	Journal maintained by the students during the academic year.
Term Work (Journal) Subject	As per Junior Field Technician Home appliances syllabus
Total Marks	10 Marks

4] Project Work:

<ul style="list-style-type: none">• The project work given in syllabus is only for guideline.• Candidate, with approval from the Instructor / Trainer, may choose any one project and prepare it.• He has full liberty to prepare any useful project other than the mentioned projects.• He may write a visit report about any nearest Industry and their product.• One project should be compulsory for each student or a group of maximum 4 students.	
• Total Marks	• 10 Marks

5] Oral/Viva vocu:	10 Marks
6] Direct Observation:	10 Marks

A) Question Wise Distribution of Marks.

Sr. No	Types of Questions	Marks	Marks with option
1	Objectives (1 Mark)	20	20
2	Short Answer Type (3 Marks)	24	36
3	Long Answer Type (4 Marks)	24	40
4	Long Answer Type (6 Marks)	12	24
	Total Marks	80	120

B) Object wise Distribution of marks

Sr. No	Objective	Marks	Percentage	Marks with Option
1	Knowledge	16	20	24
2	Understanding	36	45	48
3	Application	28	35	48
	Total	80	100	120

STD: X

Question Paper Pattern for Theory Papers

Name of course: Junior Field Technician Home Appliances (X8)

Time -3 Hrs.

Max Marks -80

- Notes:** 1. All questions are compulsory.
2. Draw diagrams wherever necessary.

Q. No. 1.A) Select the correct alternative and rewrite the sentence / Fill in the Blanks **5**

1. Installation and repair and maintenance of Fan
a)..... b) C) d)
2. Communication skills-II
a)..... b) C) d)
3. Installation and repair and maintenance of electric Iron
a)..... b) C) d)
4. Installation and repair and maintenance of Cooler
a)..... b) C) d)
5. Installation and repair and maintenance of Cooler
a)..... b) C) d)

B) Match the following pairs. **5**

- | | |
|---|----|
| 1. Installation and repair and maintenance of Fan | A) |
| 2. Self-management skills- II | B) |
| 3. Installation and repair and maintenance of Cooler | C) |
| 4. Entrepreneurial skills- II | D) |
| 5. Installation and repair and maintenance of electric Iron | E) |

C) State the following statement is true or false. **5**

1. Installation and repair and maintenance of Fan
2. Installation and repair and maintenance of electric Iron
3. Information and communication technology skills-II
4. Installation and repair and maintenance of Cooler
5. Entrepreneurial skills- II

D) Answer the following questions in ONE sentence. **5**

1. Installation and repair and maintenance of Fan
2. Entrepreneurial skills- II
3. Installation and repair and maintenance of electric Iron
4. Installation and repair and maintenance of Cooler
5. Installation and repair and maintenance of Cooler

Q. No. 2) Answer the following questions in short. (Any four) 12

1. Information and communication technology skills-II
2. Installation and repair and maintenance of electric Iron
3. Installation and repair and maintenance of Fan
4. Communication skills-II
5. Installation and repair and maintenance of Cooler
6. Installation and repair and maintenance of Fan

Q. No. 3) Answer the following questions in short. (Any four) 12

1. Installation and repair and maintenance of Fan
2. Installation and repair and maintenance of electric Iron
3. Self-management skills- II
4. Installation and repair and maintenance of Cooler
5. Entrepreneurial skills- II
6. Installation and repair and maintenance of Cooler

Q. No. 4) Answer the following questions in brief. (Any three) 12

1. Communication skills-II
2. Installation and repair and maintenance of electric Iron
3. Green skills- II
4. Installation and repair and maintenance of Fan
5. Installation and repair and maintenance of Cooler

Q. No. 5) Answer the following questions in brief. (Any three) 12

1. Installation and repair and maintenance of Fan
2. Installation and repair and maintenance of electric Iron
3. Information and communication technology skills-II
4. Installation and repair and maintenance of Cooler
5. Installation and repair and maintenance of Cooler

Q. No. 6) A) Answer the following questions in brief. (Any One) 6

1. Installation and repair and maintenance of Fan
2. Installation and repair and maintenance of electric Iron

B) Answer the following questions in brief. (Any One) 6

1. Installation and repair and maintenance of Fan
2. Installation and repair and maintenance of Cooler

Blue Print

STD-X Subject Code:X2

Name of Subject: Four Wheeler Service Assistant (QP 1401)

Unit wise Marks Distribution

BLUE PRINT

Sr.No	Unit	Knowledge			Understanding			Application			Total Marks	Total Marks With Option
		Objectives	Short Answer	Long Answer	Objectives	Short Answer	Long Answer	Objectives	Short Answer	Long Answer		
a	Part- 'A'											
1	Communication skills-II	1(1)				3 (1)				4(1)	5	8
2	Self-management skills- II		3(1)		1(1)						4	4
3	Information and communication technology skills-II	1(1)					4(1)		3(1)		5	8
4	Entrepreneurial skills- II					3(1)				4(1)	3	7
5	Green skills- II	1(1)			1(1)			1(1)			3	3
b	Part- 'B'											
1	Automobile and its components	1(1)		4(1)	1(1)	3(1)		1(1)	3(1)	6(1)	13	19
2	Automobile service tools	1(1)	3(1)		1(2)		6(1)	1(2)		4(1)	12	18
3	Vehicle servicing	1(1)			1(1)	3(1)	6(1)	1(1)	3(1)	4(1)	12	19
4	Customer sales care		3(1)	4(1)	1(1)		6(1)	1(1)		4(1)	12	19
5	Innovation and development	1(1)				3(1)	4(1)		3(1)	4(1)	11	15
	No of Question	7	3	2	7	5	5	6	4	7		
	Total Marks	7	9	8	7	15	26	6	12	30		
	Marks with options	24			48			48			80	120

*Figures in bracket indicate number of questions and figures outside bracket indicate total marks for the question.

EVALUATION SCHEME

For March-2025 and on words Examination

Subject Code: X2

STD: X

Name of course: Four Wheeler Service Assistant (QP 1401)

Time - 3 Hrs.

Max Marks -80

Scheme of Examination:

Sr. No.	Method of Assessment	Weightage of Marks	Evaluator
1	Theory Paper (Written)	30 Marks (80 Marks converted 30 Marks)	School / State Board
2	Practical Exam	30 Marks	Certified Assessor
3	Term Work (Journal)	10 Mark	School Instructor / Trainer
4	Project Work	10 Mark	School Instructor / Trainer
5	Oral / Viva Vocu	10 Mark	School Instructor / Certified Assessor
6	Direct Observation	10 Mark	School Instructor / Certified Assessor
	Total Marks	100 Marks	

A) Unit-wise Distribution of Marks

Chapter No.	Topic / unit	Marks without option	Marks with option
1.	Communication skills-II	5	8
2.	Self-management skills- II	4	4
3.	Information and communication technology skills-II	5	8
4.	Entrepreneurial skills- II	3	7
5.	Green skills- II	3	3
6.	Automobile and its components	13	19
7.	Automobile service tools	12	18
8.	Vehicle servicing	12	19
9.	Customer sales care	12	19
10.	Innovation and development	11	15
Total		80	120

2] Practical Exam:

Practical Time	3 Hours
Practical subject	As per Four Wheeler Service Assistant Syllabus
Any one practical should be given from the text book by lot system to each group / individual.	
Total Marks of Practical	• 30 Marks

3] Term Work (Journal):

Term Work (Journal)	Journal maintained by the students during the academic year.
Term Work (Journal) Subject	as per per Four Wheeler Service Assistant Syllabus
Total Marks	10 Marks

4] Project Work:

<ul style="list-style-type: none">• The project work given in syllabus is only for guideline.• Candidate, with approval from the Instructor / Trainer, may choose any one project and prepare it.• He has full liberty to prepare any useful project other than the mentioned projects.• He may write a visit report about any nearest Industry and their product.• One project should be compulsory for each student or a group of maximum 4 students.	
• Total Marks	• 10 Marks

5] Oral/Viva vocu:	10 Marks
6] Direct Observation:	10 arks

A) Question Wise Distribution of Marks.

Sr. No	Types of Questions	Marks	Marks with option
1	Objectives (1 Mark)	20	20
2	Short Answer Type (3 Marks)	24	36
3	Long Answer Type (4 Marks)	24	40
4	Long Answer Type (6 Marks)	12	24
	Total Marks	80	120

B) Object wise Distribution of marks

Sr. No	Objective	Marks	Percentage	Marks with Option
1	Knowledge	16	20	24
2	Understanding	36	45	48
3	Application	28	35	48
	Total	80	100	120

STD: X
Question Paper Pattern for Theory Papers
Name of course: Four Wheeler Service Assistant

Time -3 Hrs.

Max Marks -80

Notes: 1. All questions are compulsory.
2. Draw diagrams wherever necessary.

Q. No. 1.A) Select the correct alternative and rewrite the sentence / Fill in the Blanks **5**

1. Automobile and its components

a)..... b) C) d)

2. Communication skills-II

a)..... b) C) d)

3. Automobile service tools

a)..... b) C) d)

4. Green skills- II

a)..... b) C) d)

5. Innovation and development

a)..... b) C) d)

B) Match the following pairs. **5**

- | | |
|----------------------------------|----|
| 1. Vehicle servicing | A) |
| 2. Self-management skills- II | B) |
| 3. Automobile and its components | C) |
| 4. Green skills- II | D) |
| 5. Automobile service tools | E) |

C) State the following statement is true or false. **5**

1. Automobile service tools
2. Information and communication technology skills-II
3. Automobile service tools
4. Vehicle servicing
5. Customer sales care

D) Answer the following questions in ONE sentence. **5**

1. Automobile service tools
2. Customer sales care
3. Green skills- II
4. Automobile and its components
5. Vehicle servicing

- Q. No. 2) Answer the following questions in short. (Any four) 12
1. Automobile and its components
 2. Automobile service tools
 3. Communication skills-II
 4. Vehicle servicing
 5. Information and communication technology skills-II
 6. Innovation and development
- Q. No. 3) Answer the following questions in short. (Any four) 12
1. Automobile and its components
 2. Vehicle servicing
 3. Self-management skills- II
 4. Customer sales care
 5. Entrepreneurial skills- II
 6. Innovation and development
- Q. No. 4) Answer the following questions in brief. (Any three) 12
1. Automobile service tools
 2. Communication skills-II
 3. Customer sales care
 4. Entrepreneurial skills- II
 5. Innovation and development
- Q. No. 5) Answer the following questions in brief. (Any three) 12
1. Automobile and its components
 2. Customer sales care
 3. Information and communication technology skills-II
 4. Innovation and development
 5. Vehicle servicing
- Q. No. 6) A) Answer the following questions in brief. (Any One) 6
1. Automobile service tools
 2. Customer sales care
- B) Answer the following questions in brief. (Any One) 6
1. Vehicle servicing
 2. Automobile and its components

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

**JOB ROLE: Four-Wheeler Service Assistant
(Old: - Auto Service Technician L3)**

Qualification Pack- Ref. Id.: ASC/Q1401


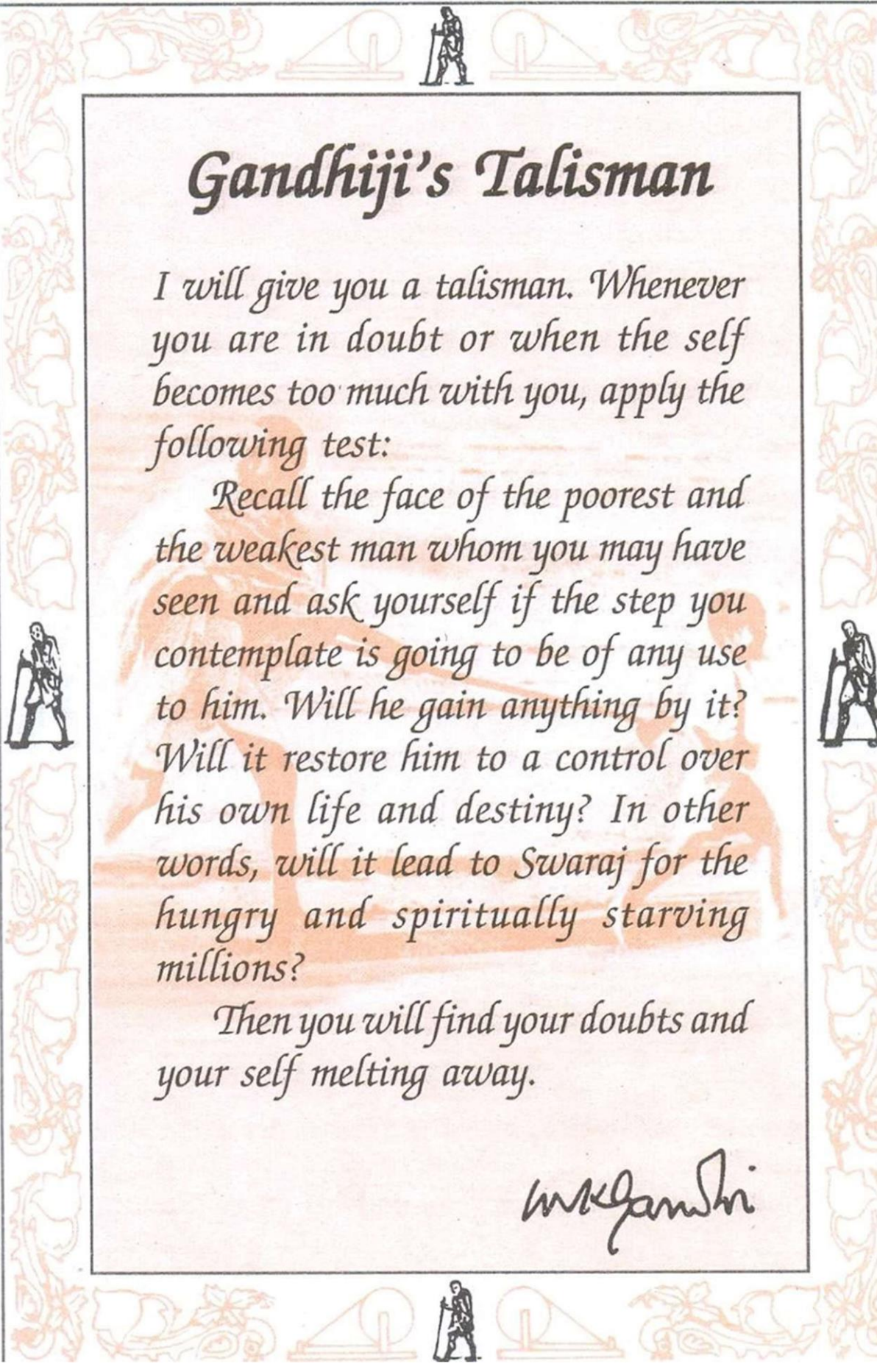
Sector: Automotive

Class: 9th and 10th




**PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
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

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

**JOB ROLE: Four Wheeler Service Assistant
(Old: - Auto Service Technician L3)**

(QUALIFICATION PACK: Ref. Id. ASC/Q1401)

SECTOR: Automotive

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

<http://www.psscive.ac.in>

LEARNING OUTCOME BASED CURRICULUM

Automotive- Four Wheeler Service Assistant
September, 2022

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Bhopal

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FOREWORD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) a constituent of the National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based curricula and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education (CSSVSHSE) launched by the Ministry of Education (MoE), 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 learning outcome 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 Four Wheeler Service Assistant. 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.

Prof. Dinesh Prasad Saklani
Director
National Council of Education Research &
Training

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth is 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. In order to fulfil the growing aspirations of our youth and the demand for a skilled human resource, the Ministry of Education (erstwhile, Ministry of Human Resource Development (MHRD), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of School 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 with the responsibility to develop learning outcome-based curricula, student textbooks and e-learning material for job roles in various sectors.

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 society and the world of work. In order to honor its commitment to the nation, the PSSCIVE is developing learning outcome- based curricula with the involvement of faculty members and leading experts in the field. It is being done through the concerted efforts of leading academicians, professionals, policymakers, partner institutions, Vocational Education and Training (VET) 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. 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.

The success of this curriculum depends upon its effective implementation, and it is expected that the managers of vocational education programme, vocational educators, vocational teachers/trainers, and other stakeholders will make earnest efforts to provide better facilities, develop linkages with the industry or world of work and foster a conducive learning environment for the students for effectively transacting the curriculum and to achieve the learning outcomes as per the content of the curriculum document.

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We are grateful to the expert contributors and reviewers for their earnest effort and contributions in the development of this learning outcome-based curriculum. Their names are acknowledged in the list of contributors and reviewers.

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PSSCIVE Team

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1. COURSE OVERVIEW

COURSE TITLE: Automotive- Four-Wheeler Service Assistant

The present curriculum Four-Wheeler Service Assistant job role is related to Level L-3. This course fulfils the needs of the students willing to learn activities relating to the Four-Wheeler Service Assistant job role. Any student/entrepreneur willing to start an Automobile Service Centre can acquire the desired competencies with the help of this curriculum. Automobile or Automotive Engineering has gained recognition and importance ever since motor vehicles capable for transporting passengers has been in vogue. Now due to the rapid growth of auto component manufacturers and automobile industries, there is a great demand for Automobile Assistant. Automobile Engineering alias Automotive Engineering or Vehicle Engineering is one of the most challenging careers in the field of engineering with a wide scope.

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

- Identify the principal components of a computer system
- Identify and control hazards in the workplace that pose a danger or threat to their safety or health, or that of others.
- Demonstrate self-management skills.
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities.
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection.
- Communicate effectively with the customers
- Greet, escort, seat the customers and offer refreshments (tea/ coffee)
- Enquire and understand customer queries related to vehicle type, model, specifications
- Identify features of different elements of Engineering such as mechanical, electrical, electronic, software and safety engineering
- Repairing and servicing automobiles such as cars, trucks, motorcycles, scooters etc.
- Understanding the mechanism of vehicle chassis, internal combustion engine,
- electrical systems, motor transport affairs, workshop technology

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

COURSE LEVEL: This is a beginner level course. On completion of this course, a student can take up an Intermediate level course for a job role in Automotive sector, such as **Four-Wheeler Service Assistant L4** in Class XI and Class XII.

COURSE DURATION:	400 hrs
Class 9	: 200 hrs
Class 10	: 200 hrs
TOTAL	: 400 hrs

2. SCHEME OF UNITS

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Class 9 and 10 opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Class 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		
	Unit 1: Communication Skills-I	20	10
	Unit 2: Self-management Skills-I	10	
	Unit 3: Information and Communication Technology Skills-I	20	
	Unit 4: Entrepreneurial Skills-I	15	
	Unit 5: Green Skills-I	10	
		75	10
Part B	Vocational Skills		
	Unit 1: History and Evolution of Automobiles	10	30
	Unit 2: Various types of Automobiles	15	
	Unit 3: Major Systems & Components of an Automobile	35	
	Unit 4: Road Safety	10	
	Unit 5: Health, Hygiene and Environment	05	
	Unit 6: Introduction to Vehicle Maintenance & Servicing	10	
	Unit 7: Innovations & Developments in Automobiles	10	
		95	30
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
		10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
		15	15

Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	5	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		
	Unit 1 : Communication Skills-II	20	10
	Unit 2 : Self-management Skills-II	10	
	Unit 3 : Information and Communication Technology Skills-II	20	
	Unit 4 : Entrepreneurial Skills-II	15	
	Unit 5 : Green Skills-II	10	
		75	10
Part B	Vocational Skills		
	Unit 1 : Automobile and its components	20	30
	Unit 2 : Automobile Service Tools	20	
	Unit 3 : Vehicle Servicing	20	
	Unit 4 : Customer sales care	20	
	Unit 5 : Innovation and Development	15	
		95	30
Part C	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
		10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
		15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	5	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 or teaching aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

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

FIELD VISITS/ EDUCATIONAL TOUR

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

4. ASSESSMENT AND CERTIFICATION

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

The National Skills Qualifications Framework (NSQF) is based on outcomes referenced to the National Occupation Standards (NOSs), rather than inputs. The NSQF level descriptors, which are the learning outcomes for each level, include the process, professional knowledge, professional skills, core skills and responsibility. The assessment is to be undertaken to verify that individuals have the knowledge and skills needed to perform a particular job and that the learning programme undertaken has delivered education at a given standard. It should be closely linked to certification so that the individual and the employer could come to know the competencies acquired through the vocational subject or course. The assessment should be reliable,

valid, flexible, convenient, cost effective and above all it should be fair and transparent. Standardized assessment tools should be used for assessment of knowledge of students. Necessary arrangements should be made for using technology in assessment of students.

KNOWLEDGE ASSESSMENT (THEORY)

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

WRITTEN TEST

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

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

Duration: 3 hrs Max. Mark: 30

S.No.	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

Sub-Unit 1: Communication Skills-I			
Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Total 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"> (i) sender, (ii) ideas, (iii) encoding, (iv) 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 - Past experience - Prejudices - Feelings - Environment 	1. Group discussion on factors affecting perspectives in communication 2. Sharing of experiences on factors affecting perspectives 3. Sharing experiences on factors affecting communication at workplace	05
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

Sub-Unit 2: Self-management-I			
Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Total 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

Sub-Unit 3: Information and Communication Technology Skills- I			
Learning Outcome	Theory (06 hrs)	Practical (14 hrs)	Total 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	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	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

	5.Procedure for starting and shutting down a computer		
3. Demonstrate use of various components and peripherals of computer system	1. Peripherals devices and their uses – mouse, keyboard, scanner, webcam, etc. of a computer system	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	1. Primary operations on a computer system – input, process, storage, output, communication networking, etc.	1. Identification of the various input and output units and explanation of their purposes	04

Sub-Unit 4: Entrepreneurship Development - I

Learning Outcome	Theory (06 hrs)	Practical (09 hrs)	Total 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 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	09

1. 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/presentation s by entrepreneurs on their experiences and success stories 4. Identify core skills of successful entrepreneur	06
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Sub-Unit 5: Green Skills - I

Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Total Duration (10 Hrs)
1. Demonstrated the knowledge of the factors influencing natural resource conservation	1. Introduction to environment, Relationship between society and environment, ecosystem and factors causing imbalance 2. Natural resource conservation 3. Environment protection and conservation	1. Group discussion on hazards of deteriorating environment 2. Prepare posters showing environment conservation 3. Discussion on various factors that influence our environment	05
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. green economy 3. Prepare a Poster showing the importance of green economy with the help of newspaper/magazine cuttings	05
Total	34	41	75

Part B: Vocational Skills

S. No.	Units	Duration (Hrs.)
1	Unit 1: History and Evolution of Automobiles	10
2	Unit 2: Various types of Automobiles	15
3	Unit 3: Major Systems & Components of an Automobile	35
4	Unit 4: Road Safety	10
5	Unit 5: Health, Hygiene and Environment	05
6	Unit 6: Introduction to Vehicle Maintenance & Servicing	10
7	Unit 7: Innovations & Developments in Automobiles	10
	Total	95

Unit 1: History and Evolution of Automobile			
Learning Outcome	KNOWLEDGE CRITERIA	PERFORMANCE CRITERIA	Duration (10 Hrs)
Describe the Invention of wheel, Invention of wheel cart and animal powered horse cart, Invention of Automobiles and Evaluation till date, Invention of automobile (Post world war II)	Invention of wheel Invention of wheel cart and animal powered cart, Use of horse cart and horse power, Invention of Automobiles and Evolution till date, Invention of automobile and Evaluation post World War II	Able to describe the Invention of wheel, wheel cart, Able to explain use of horse power, Able to describe Invention of Automobiles and Evolution till date, Able to describe Invention of Automobile and Evolution post World WarII	10

Unit 2: Various types of Automobiles			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
Able to identify Two Wheelers Three Wheelers, Passenger vehicle, Commercial vehicle, Agricultural vehicle, Construction Equipment Vehicle, Special Vehicles	Special vehicle, make, model, specifications Parts/Components of Special Vehicles	Able to identify three Wheelers used, make drawing of three Wheelers, Able to identify passenger vehicles used, make a drawing of passenger vehicle, Able to identify commercial vehicle used, make drawing of commercial vehicle, Able to identify agricultural vehicle used. Make drawing of agricultural vehicle.	15

		Identify construction equipment vehicle used. Drawing of construction equipment vehicles, Able to identify special vehicles used, Drawing of special vehicles	
Total			15

Unit 3: Major Systems & Components of an Automobile			
Learning Outcome	Theory	Practical	Duration (30 Hrs)
Identify and discuss major systems and components of an automobile	Use of Chassis Frame and Auto body Use of Engine and its components Use of Lubrication System Use of Cooling System Use of Fuel Supply system Use of Transmission System, Use of Front and Rear Use of Steering Use of Suspension System Use of Wheels and Tyres Use of Brake Use of Electrical & electronic Systems Use of Air Conditioning System Use of Active and Passive Safety	Able to identify and describe the importance of Chassis Frame and Auto Body Able to make a drawing of the Chassis Frame and Auto Body Able to identify and describe the importance of the Engine and its components Able to make a drawing of the Engine and its components. Able to identify and describe the importance of the Lubrication and its components Able to make a drawing of the Lubrication system and its components Able to identify and describe the importance Cooling System, Able to make a drawing of the Cooling System Able to identify and describe importance Fuel Supply System, Able to make a drawing of the Fuel Supply System, Able to identify, describe importance of Transmission System, Able to make a drawing of the Transmission System, Able to identify and describe the importance of Front and Rear Axle, Able to make a drawing of the Front and Rear Axle Able to identify and describe the importance of steering,	30

		<p>Able to make drawing of steering</p> <p>Able to identify and describe importance of suspension system</p> <p>Able to make a drawing of the Suspension System</p> <p>Able to identify and describe the importance Wheels and Tyres</p> <p>Able to make drawing of Wheels and Tyres</p> <p>Able to identify and describe importance of Brake</p> <p>Able to make drawing of Brake</p> <p>Able to identify and describe the importance of the Electrical & Electronic Systems</p> <p>Able to make a drawing of the Electrical & Electronic Systems.</p> <p>Able to identify and describe the importance of Air Conditioning System</p> <p>Able to make a drawing of Air Conditioning System,</p> <p>Able to identify and describe importance of Active and Passive Safety</p> <p>Able to make a drawing of Active and Passive Safety</p>	
Total			30

Unit 4: Road safety			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
Importance of road safety rules Safe and responsible driving Road Signs Driving rules and Registration of a vehicle Driving License	Importance of safety rules and safe practices, Safe and responsible driving, Road Signs, Traffic signals and rules, Driving rules and registration, License rules	<p>Able to list the safety rules to be followed.</p> <p>Able to list the safe and responsible driving procedures practices while driving.</p> <p>Able to identify various road signs, traffic signals and describe the rules</p> <p>Able to make sketch of various road sign, traffic signals and describe the rules,</p> <p>Able to describe driving rules</p>	10

		Able to fill forms for driving and registration, Able to describe different license forms Able to write license rules Able to fill forms for license	
Total			25

Unit 5: Health, Hygiene and Environment

Learning Outcome	Theory	Practical	Duration (5 Hrs)
Air pollution Auto Emissions and EU/ BS Standards PUC Certification Identify the recyclable and non-recyclable and hazardous waste Tips to keep advanced hygiene and sanitation issue	Air Pollution and its norms Air Pollution and automobiles, Auto emissions and EU/ BS Standards, PUC Certification Segregate waste into different categories Dispose non-recyclable waste appropriately Importance of hygiene, sanitization of workstation and equipment. Dispose Wearing PPE.	Able to list Air pollution norms Able to observe Air Pollution and Automobiles, Able to identify various tandards like EU/ BS, PUC Certification Able to make list of various standards, Able to describe about PUC Certification. Deposit recyclable and reusable material at identified location Make a list of items used in work station for hygiene maintenance	5
Total			5

Unit 6: Introduction to Vehicle Maintenance and Servicing

Learning Outcome	Theory	Practical	Duration (10 Hrs)
Importance of Vehicle Maintenance and Servicing Tips to Extend the Life of Vehicles Introduction to Vehicle Servicing procedure	Importance of Vehicle Maintenance and Servicing, Tips to extend the life of vehicles, Procedures during vehicle servicing	Able to perform basic procedures for vehicle maintenance Able to describe vehicle maintenance Able to list tips to extend the life of Vehicles Able to check the tips, Able to list procedures during vehicle servicing	10
Total			10

Unit 7: Innovation and Development			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
Explain Innovation and Development	Importance of innovation and development	Able to identify innovation in Automobiles. Able to understand about new developments	10
Total			10

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 (12 hrs)	Practical (08 hrs)	Total Duration (20 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication Verbal - Non-verbal Visual	Writing pros and cons of written, verbal and non-verbal communication Listing do's and don'ts for avoiding common body language mistakes	05
3. 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	1. Constructing sentences for providing descriptive and specific feedback	03

	4. Specific and nonspecific feedback		
3. Apply measures to overcome barriers in communication	<ol style="list-style-type: none"> 1. Barriers to effective communication – types and factors 2. Measures to overcome barriers in effective communication 	<ol style="list-style-type: none"> 1. Enlisting barriers to effective communication 2. Applying measures to overcome barriers in communication 	04
4. Apply principles of communication	<ol style="list-style-type: none"> 1. Principles of effective communication 7 Cs of effective communication 	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. 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 	<ol style="list-style-type: none"> 1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject 	05
Total			20

Unit 2: Self-management Skills - II			
Learning Outcome	Theory (05 hrs)	Practical (05 hrs)	Total Duration (10 Hrs)
1. Apply stress management techniques	<ol style="list-style-type: none"> 1. Meaning and importance of stress management 2. Stress management techniques – physical exercise, yoga, meditation Enjoying, going to vacations and holidays with family and friends Taking nature walks 	<ol style="list-style-type: none"> 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

2. Demonstrate the ability to work independently	1. Importance of the ability to work independently Describe the types of self-awareness 2. Describe the meaning of self-motivation 3. and self-regulation	1. Demonstration on working independently goals 2. Planning of an activity 3. Executing tasks in a specific period, with no help or directives 4. Demonstration on the qualities required for working independently	04
Total			10

Unit 3: Information and Communication Technology Skills- II			
Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Total 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 filesystem 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 subfolders, 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 Cleaning computer components Preparing maintenance schedule Protecting computer against viruses Scanning and cleaning viruses and removing SPAM files, temporary files and folders	1. Demonstration of the procedures to be followed for cleaning, care and maintenance of hardware and software	03
Total			20

Unit 4: Entrepreneurial Skills - II			
Learning Outcome	Theory (06 hrs)	Practical (09 hrs)	Total Duration (15 Hrs)
1. List the characteristics of successful entrepreneur	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	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. Plan in team for setting up a business	15
Total			15

Unit 5: Green Skills - II			
Learning Outcome	Theory (07 hrs)	Practical (03hrs)	Total Duration (10 Hrs)
1. Demonstrate the knowledge of importance, problems and solutions related to sustainable development	1. Definition of sustainable development 2. Importance of sustainable development 3. Problems related to sustainable development	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 benefits of environmental citizenship, including the conservation and protection of environmental values 4. Preparing models on rain water harvesting, drip / sprinkler irrigation, vermicompost, solar energy, solar cooker, etc.	10
Total			10

Part B: Vocational Skills

S. No.	Units	Duration (Hrs.)
1	Unit 1: Automobile and its components	20
2	Unit 2: Automobile Service Tools	20
3	Unit 3: Vehicle Servicing	20
4	Unit 4: Customer sales care	20
5	Unit 5: Innovation and Development	15
	Total	95

Unit 1: Automobile and its components			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
Identify Chassis Body Engine Lubrication System Cooling System Fuel Supply system Transmission System Front axle Steering Rear axle Suspension System Wheel and Tyre Brake	Chassis Body and Use Engine and its components Lubrication System Cooling System Fuel Supply system Transmission System Front axle Steering Rear axle Suspension System Wheels and Tyres Brakes	Able to identify and describe Chassis Able to understand details of Chassis Able to identify and describe Body Able to understand details of body Able to identify and describe Engine and its type Able to understand details of engine	20
Total			20

Unit 2: Automobile Service tools			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
Identify Hand Tools, Measuring Tools, Electrical Tools, Special Tools, Service, Workshop machine.	Able to identify hand tools used. Drawing of hand tools. Measurement tools make, model, specifications Parts/Components of measurement tools. Electrical tools make, model, specifications Parts/Components of electrical tools, Special tools make, model, specifications Parts/Components of Special tools Service workshop equipment make, model, specifications Parts/Components of hand tools	Identify and handle hand tools Parts/Components of hand tools Able to identify measurement tools used. Drawing of measurement tools Able to identify electrical tools used Drawing of electrical tools Able to identify special tools Drawing of special tools, Able to identify Service workshop equipment Drawing of hand tools	20
Total			20

Unit 3: Vehicle Servicing			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
Washing of a Vehicle Changing of oil and oil filter Changing of air filter Changing of fuel filter Changing of Coolant	Washing of a Vehicle Changing of oil and oil filter Changing of air filter Change the fuel filter Changing of coolant	Able to understand washing procedure of a Vehicle. Able to do washing of a Vehicle Able to understand procedure of changing of oil and oil filter Able to understand procedure of air filter changing Able to change air filter Able to change the oil and oil filter Able to understand procedure of air filter changing Able to change air filter Able to understand procedure of fuel filter changing Able to change fuel filter Able to understand procedure of changing of coolant Able to change coolant	20
Total			20

Unit 4: Customer Sales care			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
Customer service	Customer service	Able to understand about meaning of customer service Able to list duties of a automobile sales person	20
Total			20

Unit 5: Innovation and development			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
Explain about Innovation and Development in automobile	Importance of innovation and development	Able to identify innovation in automobile. Able to understand about new development	20
Total			20

6. ORGANISATION OF FIELD VISITS

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace like. Automobile show room, Automobile Fair, Different section of show room and service centre, Tele caller centre, Service centre Visit a Automobile showroom and service centre and observe the following: During the visit,

students should obtain the following information from the owner or the supervisor of the showroom:

1. Activity of Automobile show room
2. Different section of show room and service centre
3. Service centre activity
4. Automobile Fair
5. Different section of showroom
6. Number of Vehicle sold annually
7. Power transmission section of engine
8. Type of engine and technology
9. Automation system
10. Denting and painting section
11. Electrical section
12. Auto electrical system

7. LIST OF EQUIPMENT AND MATERIALS

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

Tools and Equipment's and Training materials

- Compressor
- Spark plug cleaning machine
- Screw driver (Star & minus)
- Double End Ring spanner
- Open and Close (Fix) spanner
- Socket (Goti) spanner
- Plier
- Monkey plier
- Outer and inner plier
- Tool box
- T spanner (tommy) set
- Allen key set
- Tappet puller
- Tappet gauge
- Multimeter
- Tachometer
- Hammer
- Compressor gauge
- Oil measure container, funnel
- Oil can
- Tools trolley
- Magnetic bar

Basic Tool Box

- Workshop tool/equipment: drain pan, oil can, jack hydraulic, bench vice, ramp, pneumatic tool, equipment stands, etc.
- Pressure indicators: oil pressure gauges, tire pressure gauges etc.
- Specialty wrenches: alignment wrenches, chain wrenches, locking wrenches, lug wrenches etc.
- Trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc.
- Measuring equipment: Vernier, calipers, micrometer, feeler gauges, multi-metre, flow meter, temp gauge, dial gauge etc.
- Other tools: hand tools, power tools, lifting and jacking equipment, tensioning equipment, brake roller tester, chassis dynamometer, suspension activation, security activator etc.
- Tools for other tasks such as cleaning of vehicles, tools, equipment and workshop
- Personal Protection Equipment: Gloves, Safety Shoes, goggles, ear plugs, boiler suit
- Workshop Safety: Fire extinguishers
- First Aid

Consumable items: cotton waste, petrol/diesel, lubricant, grease, storage containers, air filters, oil filters, spark plugs, glow plugs etc.

- Worn out/ defective/ spurious samples: seal, gaskets, clutch plate, brake shoes, brake pads, spark plug, oil filter, air cleaner etc.

Teaching Aids:

Charts, CBTs, LCD Projector and Videos.

- Cleaning equipment and solutions
- SOP Charts on safety norms and drills • Charts of dos and Don'ts in work area.
- Audio/video on English, Hindi or local language course
- Reference books
- Work books
- Study for Soft Skills
- CBTs on working on computer
- Computer system
- UPS

□ Vehicle service manuals, vehicle hand book, job card, work order, completion material requests, Technical reference books.

List of cut section working model

S.No.	Name of working automotive model	Quantity	Price
1.	Four stroke working petrol engines or diesel engines model	1	30,000
3	Old second hand Radiator	1	2000
4	Old second hand pressure cap	1	150
5	Old second hand thermostat	1	2000
6	Old second hand disc brake	1	1000
8	Four wheelers old second hand vehicle	1	50000
9	MPFI working model system	1	5000
10	Old second hand motor cycle	1	10000

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:

S.No.	Qualification	Minimum Competencies	Age Limit
1.	Degree in Automobile Engineering /Mechanical Engineering from a recognized Institute /University, with at least 1 year work / teaching experience Or Diploma in Automobile Engineering /Mechanical Engineering from a recognized Institute /University, with at least 3 year work / teaching experience Or B.Voc in Automotive Engineering from a recognized Institute /University, with at least 2 year work/teaching experience	Effective communication skills (oral and written) Basic computing skills.	18-37 years (as on Jan. 01 (year)) Age relaxation to be provided as per Govt. rules.

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

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

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

Through accredited Vocational Training Providers accredited under the National Quality Assurance Framework (NQAF*) approved by the National Skill Qualification Committee on 21.07.2016. If the State is engaging Vocational Teachers/Trainers through the Vocational Training Provider (VTP), it should ensure that VTP should have been accredited at NQAF Level 2 or higher.

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

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

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

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

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

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

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

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

- (i) Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- (ii) Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- (iii) Make effective use of learning aids and ICT tools during the classroom sessions;

- (iv) 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;
- (v) Work with the institution's management to organise skill demonstrations, site visits, onjob trainings, and presentations for students in cooperation with industry, enterprises and other workplaces;
- (vi) Identify the weaknesses of students and assist them in up-gradation of competency;
- (vii) Cater to different learning styles and level of ability of students;
- (viii) Assess the learning needs and abilities, when working with students with different abilities
- (ix) Identify any additional support the student may need and help to make special arrangements for that support;
- (x) 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 counselling 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. Organisation of activities for promotion of vocational subjects;
11. Involvement in placement of students/student support services.

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LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:

Junior Field Technician Home Appliances

(QUALIFICATION PACK: Ref. Id. ELE/Q3117)

SECTOR: Electronics

Grades IX and X



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Electronics Sector

March, 2023

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<http://www.psscive.ac.in>

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Published by:

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 Human Resource Development, Government of India in 2012. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Samagra Shiksha*. The main purpose of the competency based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject.

It is a matter of great pleasure to introduce this learning outcome based curriculum as part of the vocational training packages for the job role of **Electronics – Junior Field Technician Home Appliances**. 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 PSSCIVE has initiated the work on developing learning outcome based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training experts, industry representatives, and teachers. The expert group through a series of consultations, working group meetings and use of reference materials develops a National Curriculum. Currently, the Institute is working on developing curricula and 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 Ministry of Education 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 Ministry of Education.

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 Human Resource Development (MHRD), Government of India for the financial support to the project for development of curricula.

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

We are grateful to the expert contributors and Deepak D. Shudhalwar, Associate Professor (CSE), PSSCIVE, for their earnest effort and contributions in the development of this learning outcome based curriculum. Their contributions are duly 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 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: Junior Field Technician Home Appliances

Junior Field Technician Home Appliances, diagnose the source of problems or malfunctions with household appliances and repairs them. They use hand and power tools to troubleshoot, disassemble, fix, and install a variety of home appliances, including electric iron, fan, cooler and similar others. They rectifies minor problems or replaces faulty modules for failed parts or recommends factory repairs for bigger faults.

The individual at work is responsible for interacting with the customers for installation of the appliance and diagnosis of the problem to assess possible causes of malfunction, rectification of the problem, replacement of faulty Parts. The individual must also possess important attributes such as punctuality, amenable behaviour, patience, good interpersonal relationship building, trustworthiness, integrity, and critical thinking.

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

- ✓ Apply effective oral and written communication skills to interact with 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;
- ✓ Identify the basic parameters of electricity;
- ✓ Demonstrate to verify the Ohm's Law and Kirchhoff's Law;
- ✓ Develop an electric circuit and explain its types;
- ✓ Identify and list active, passive and electromechanical components used in a circuit;
- ✓ Demonstrate to read values of electronic components;
- ✓ Identify and use different hand tools and electronics tools;
- ✓ Identify the different types and models of air conditioners with its features;
- ✓ Conduct pre-installation tasks;
- ✓ Conduct installation of home appliances;
- ✓ Conduct post-installation tasks;
- ✓ Perform troubleshooting to identify the fault and its cause;
- ✓ Repair or replace the dysfunctional part of LED and other lights;
- ✓ Repair or replace the dysfunctional part of Electric Iron;
- ✓ Repair or replace the dysfunctional part of Fan;
- ✓ Repair or replace the dysfunctional part of Cooler;
- ✓ Perform post-repair check up and documentation;
- ✓ Check the functionality after repairing or replacement of dysfunctional part;
- ✓ Comply with the standard safety procedures to maintain a safe work area;

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

COURSE LEVEL: This course can be taken up at Intermediate level in Grade 9 and 10.

COURSE DURATION: Total : 400 hours

Class 11 : 200 hours

Class 12 : 200 hours

2. SCHEME OF UNITS AND ASSESSMENT

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

Grade IX			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory & Practical 100
Part A	Employability Skills		
Unit 1	Communication Skills – I	15	10
Unit 2	Self-management Skills – I	10	
Unit 3	Information and Communication Technology Skills – I	15	
Unit 4	Entrepreneurial Skills – I	10	
Unit 5	Green Skills – I	10	
	Total	60	10
Part B	Vocational Skills		
Unit 1	Basic Electrical, Electronics, Tools and Equipment	45	30
Unit 2	Installation and Repair and Maintenance of LED and other Lights	45	
Unit 3	Work Ethics, Quality, Sustainability and Safety	30	
	Total	120	40
Part C	Practical Work		
	Practical Examination		15
	Written Test		10
	Viva Voce		10
	Total		35
Part D	Project Work/Field Visit		
	Practical File/ Student Portfolio		10
	Viva Voce		5
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		10
	Total	200	100

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

Grade X			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
Unit 1	Communication Skills – IV	15	10
Unit 2	Self-management Skills – IV	10	
Unit 3	Basic ICT Skills – IV	15	
Unit 4	Entrepreneurial Skills – IV	10	
Unit 5	Green Skills – IV	10	
	Total	60	10
Part B	Vocational Skills		
Unit 1	Installation and Repair and Maintenance of Electric Iron	30	30
Unit 2	Installation and Repair and Maintenance of Fan	45	
Unit 3	Installation and Repair and Maintenance of Cooler	45	
	Total	120	30
Part C	Practical Work		
	Practical Examination		15
	Written Test		10
	Viva Voce		10
	Total		35
Part D	Project Work/Field Visit		
	Practical File/ Student Portfolio		10
	Viva Voce		5
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)	5	10
	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, and subject experts from university/colleges or industry. The respective Sector Skill Council should be consulted by the Central/State Board for preparing the panel of experts for question paper setting and conducting the examinations.

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

Duration: 3 hrs

Max. Mark: 30

S N	Typology of Question	No. of Very Short Answer Q. (1 mark)	No. of Short Answer Q. (2 Marks)	No. of Long Answer Q. (3 Marks)	Marks
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	2	1	2	10
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	1	2	2	11
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	1	1	05
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	1	0	02
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	Total	3x1=3	6x2=12	5x3=15	30 (14 Q.)

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 IX

Part A: Employability Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Communication Skills – I	15
Unit 2	Self-management Skills – I	10
Unit 3	Information and Communication Technology Skills – I	15
Unit 4	Entrepreneurial Skills – I	10
Unit 5	Green Skills – I	10
	Total	60

Unit 1: Communication Skills – I

Sn	Learning Outcome	Theory (05 Hours)	Practical (10 Hours)	15
1	Demonstrate the Knowledge of Importance, Elements, and Perspectives in Communication	<ul style="list-style-type: none"> • Introduction to communication • Importance of communication • Elements of communication • Perspective in communication • Effective communication 	<ul style="list-style-type: none"> • Role play on the communication process, • Group discussion and sharing of experiences on factors affecting communication, • Asking students to write examples of 7Cs (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete), • Preparing charts for elements of communication 	02
2	Demonstrate the knowledge of verbal communication	<ul style="list-style-type: none"> • Verbal communication, • Types of verbal communication, • Advantages & disadvantages of verbal communication • Public speaking 	<ul style="list-style-type: none"> • Role play of a phone conversation • Chat preparation on types of verbal communication • Group discussion on advantages and disadvantages of verbal communication • Delivering a speech and practicing public speaking by using 3P's. 	02
3	Demonstrate the knowledge of non-verbal communication	<ul style="list-style-type: none"> • Non-verbal communication • Importance of non-verbal communication • Types of non-verbal communication • Visual communication 	<ul style="list-style-type: none"> • Role plays on non-verbal communication, • Group discussion and demonstration of Do's and Don'ts to avoid body language mistakes, • Group discussion on three 	01

			methods of communication.	
4	Demonstrate basic writing skills	<ul style="list-style-type: none"> Writing skills: Parts of speech, Using capitals, Punctuations, Basic parts of speech. 	<ul style="list-style-type: none"> Reading paragraphs and sentences and identifying parts of speech, Constructing and writing sentences by using parts of speech, Identifying nouns by guessing the name, place, animal, and thing. 	02
5	Describe the parts and types of sentences	<ul style="list-style-type: none"> Writing skills: Sentences, Parts of a sentence, Types of objects, Types of sentences – active and passive, Types of sentences, according to their purpose, Paragraphs. 	<ul style="list-style-type: none"> Making and writing sentences using direct and indirect objects, Writing paragraph using active and passive voice, Writing different types of sentences (i.e. declarative, exclamatory, interrogative and imperative). 	01
6	Demonstrate the knowledge of pronunciation basics	<ul style="list-style-type: none"> Pronunciation basics, Speaking correctly, Phonetics, Types of sounds. 	<ul style="list-style-type: none"> Pronouncing words and identifying vowels, diphthongs and consonants, Practicing the pronunciation of words. 	01
7	Demonstrate how to greet and introduce self	<ul style="list-style-type: none"> Greetings and Introductions, Types of greetings, Introducing self and others 	<ul style="list-style-type: none"> Role-play on formal and informal greetings Role-play on introducing someone, Practicing greeting people. 	01
8	Answer questions that others ask about you	<ul style="list-style-type: none"> Talking about self, Filling a form about self. 	<ul style="list-style-type: none"> Practicing introducing self out form, Practicing how to talk about self 	01
9	Asking questions according to a situation	<ul style="list-style-type: none"> Asking questions, Need for asking questions, 5W+1H (Who, Where, When, What, Why+How) method for asking questions. 	<ul style="list-style-type: none"> Framing and writing questions (using Who, Where, When, What, Why and How) Framing and writing questions, based on purpose of the question, Discussing and guessing the personality using framed questions. 	02
10	Use the correct question words to ask open-ended and close-ended questions	<ul style="list-style-type: none"> Asking questions Types of questions Framing questions – open ended and close ended. 	<ul style="list-style-type: none"> Framing and writing open-ended and close-ended questions. Group practice on framing questions. 	02
			Total Duration in Hours	15

Unit 2: Self-management Skills – I

Sn	Learning Outcome	Theory (07 Hours)	Practical (03 Hours)	10
1.	Describe the meaning and importance of self-management	<ul style="list-style-type: none"> • Introduction to self management and its components • Self-awareness • Self-confidence • Self-motivation • Positive thinking • Self-control • Problem solving • Personal hygiene and grooming, • Team work • Time management • Goal setting 	<ul style="list-style-type: none"> • Group discussion on self-management skills • Performing activities to know how much aware are you about yourself. • Chart preparation on components of self-management 	01
2.	Identify strength and weakness analysis	<ul style="list-style-type: none"> • Identifying strength and weakness • Knowing yourself • Strength and weakness analysis • Difference between interests and abilities 	<ul style="list-style-type: none"> • Group discussion on aim and goal in life • Perform a strength and weakness analysis • Group discussion on interests and abilities 	01
3.	Build self-confidence	<ul style="list-style-type: none"> • Self-confidence, • Qualities of self-confident people, • Building self-confidence 	<ul style="list-style-type: none"> • Role play on building self-confidence • Performing activities on building confidence through positive words 	02
4.	Build the concept on positive thinking	<ul style="list-style-type: none"> • Positive thinking, • Positive thinking and its importance, • How to keep your things positive 	<ul style="list-style-type: none"> • Storytelling, • Role-play on following the class rules • Practicing saying positive words • Making a list of steps involved in self-reflection) on how you will follow positive attitude practices • Home activity on helping others, 	02
5	Describe the concept and aspects of personal hygiene	<ul style="list-style-type: none"> • Personal hygiene • Three steps of personal hygiene - Care, Wash, Avoid • Essential steps of handwashing 	<ul style="list-style-type: none"> • Role-play on following personal hygiene steps • Discussion and follow up on personal hygiene practices 	02
6	Follow the guidelines for dressing and personal grooming	<ul style="list-style-type: none"> • Grooming • Grooming and its importance, • Guidelines for dressing and personal grooming – clothes, hair, face 	<ul style="list-style-type: none"> • Role play on dressing and grooming standards • Self-reflection on dressing and grooming well 	02
			Total Duration in Hours	10

Unit 3: Information and Communication Technology Skills – I

Sn	Learning Outcome	Theory (05 Hours)	Practical (10 Hours)	15
1.	Explain the role of Information and Communication Technology (ICT) in day-to-day life and the workplace	<ul style="list-style-type: none"> • Introduction to Information and Communication Technology (ICT) • ICT at workplace • ICT at home 	<ul style="list-style-type: none"> • Group discussion on past, present, and future use of ICT • Preparations of posters on applications of ICT 	02
2.	Differentiate between the ICT tools and use of mobile apps	<ul style="list-style-type: none"> • ICT tools – • Smartphones, • Tablets, • TV and Radio 	<ul style="list-style-type: none"> • Performing activities to get familiar with mobile devices 	01
3.	Differentiate between smartphones and tablets	<ul style="list-style-type: none"> • ICT tools – smartphone and tablet, • Mobile device layout • Basic features of a mobile device • Home screen of mobile device • Basic gestures used 	<ul style="list-style-type: none"> • Performing activities to get familiar with the mobile device – use and applications of mobile devices 	01
4.	Describe the parts of computer and computer peripherals	<ul style="list-style-type: none"> • Parts of a computer, • Input devices, • Output devices, • Peripherals devices and their functions, • Central Processing Unit (CPU), • Understanding Random Access Memory (RAM) and Read Only Memory (ROM), • Motherboard, • Ports and connectons. 	<ul style="list-style-type: none"> • Chart preparation on components of a computer • Group activity on connecting devices to a computer 	02
5.	Demonstrate basic computer operations	<ul style="list-style-type: none"> • Basic computer operations, • Computer hardware and software, • Starting a computer, • Log in and log out, • Shutting down computer, • Using the keyboard • Using mouse 	<ul style="list-style-type: none"> • Group activity on use of computer • Group practice on using the keyboard 	02
6.	Perform basic file operations	<ul style="list-style-type: none"> • Performing Basic file operations, • File and folders – creating afile and using text editor 	<ul style="list-style-type: none"> • Group practice on creating a file 	01
7.	Demonstrate the knowledge of internet and networking	<ul style="list-style-type: none"> • Communication and Networking -Internet browsing • Use of internet • Connecting to internet • Types of connection 	<ul style="list-style-type: none"> • Group discussion on the uses of internet 	01

		<ul style="list-style-type: none"> Bandwidth Internet browser 		
8.	Perform internet browsing	<ul style="list-style-type: none"> World Wide Web Web pages Web browsers 	<ul style="list-style-type: none"> Group practice on web browsing 	01
9.	Apply the knowledge of communication networking	<ul style="list-style-type: none"> Introduction to Email Working of Email Email address Advantages of Email 	<ul style="list-style-type: none"> Group discussion on using Email and its advantages 	01
10.	Create an Email account	<ul style="list-style-type: none"> Creating an Email account Steps to open an Email account on Gmail 	<ul style="list-style-type: none"> Group practice on creating and opening an Email account 	01
11.	Write an Email	<ul style="list-style-type: none"> Writing an Email Attaching a file to an Email Managing folders in Email account 	<ul style="list-style-type: none"> Group practice on receiving and replying to an email message 	01
12.	Reply an Email	<ul style="list-style-type: none"> Receiving Email, Replying to an Email Forwarding Email Deleting Email 	<ul style="list-style-type: none"> Group practice on receiving and replying to an Email. 	01
			Total Duration in Hours	15

Unit 4: Entrepreneurial Skills – I

Sn	Learning Outcome	Theory (05 Hours)	Practical (05 Hours)	10
1.	Describe the concept of Entrepreneurship skills	<ul style="list-style-type: none"> Concept of Entrepreneurship and Enterprise 	<ul style="list-style-type: none"> Group activity on guessing the Entrepreneur 	01
2.	Describe the role of entrepreneurship	<ul style="list-style-type: none"> Role of Entrepreneurship Economic development Social development Improved standard of living Optimal use of resources More benefits at lower prices products and services at competitive prices 	<ul style="list-style-type: none"> Group discussion on "A world without entrepreneurship" Role play on roles of entrepreneurship 	02
3.	Describe the qualities of a successful entrepreneur	<ul style="list-style-type: none"> Qualities of a successful entrepreneur Patience Positive attitude Hardworking Confident Open to trial and error Creative and innovative 	<ul style="list-style-type: none"> Role play on appearing for interview Group activity on interactions with entrepreneurs 	02
4.	State the characteristics of	<ul style="list-style-type: none"> Distinguishing characteristics of entrepreneurship and wage 	<ul style="list-style-type: none"> Group activity on identifying characteristics of enterprise 	02

	entrepreneurship	employment <ul style="list-style-type: none"> • Characteristics of entrepreneurship • Wage employment • Benefits of entrepreneurship 	<ul style="list-style-type: none"> • Discussion on advantages of entrepreneurship over wage employment 	
5.	Identify the type of business activity	<ul style="list-style-type: none"> • Types of business activities • Product business • Service business • Hybrid business 	<ul style="list-style-type: none"> • Group activity on identifying different types of products and services 	01
6.	Differentiate between the product, service, and hybrid businesses	<ul style="list-style-type: none"> • Product, Service, and Hybrid Businesses • Types of product-based business • Manufacturing businesses • Trade businesses 	<ul style="list-style-type: none"> • Poster making on business activities around us 	01
7.	Describe the entrepreneurship development process	<ul style="list-style-type: none"> • Entrepreneurship development process • Steps of starting a business – idea generation, getting money and material, understanding customer needs, improving product/ service 	<ul style="list-style-type: none"> • Group activity on Make-and-Sell business 	01
			Total Duration in Hours	10

Unit 5: Green Skills – I

Sn	Learning Outcome	Theory (07 Hours)	Practical (03 Hours)	10
1.	Demonstrate the knowledge of society and environment	<ul style="list-style-type: none"> • Society and Environment • Natural resources • Renewable and Non-renewable resources • Types of pollutions • Climate change • Harmful radiation • Natural disaster • Saving the environment: What can you do? • Reduce, reuse and recycle • Actions for saving the environment 	<ul style="list-style-type: none"> • Group activity on listing the factors influencing the environment • Group activity on listing the steps one can take to save the environment 	05
2.	Describe the meaning and importance of conserving natural resources	<ul style="list-style-type: none"> • Conserving the natural resources • Soil conservation • Water conservation • Energy conservation • Food conservation • Forest conservation 	<ul style="list-style-type: none"> • Group discussion on conserving natural resources 	02

3.	Describe the meaning and scope of sustainable development and green economy	<ul style="list-style-type: none"> Sustainable Development Sustainable Development Goals (SDGs) Green growth Green economy Components of green economy – Renewable energy, green building, well managed Skill development for the green economy Green skills Green jobs Green projects 	<ul style="list-style-type: none"> Group discussion on importance of green skills Poster making on importance of green economy 	03
			Total Duration in Hours	10

Grade IX, Part B: Vocational Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Fundamentals of Electrical and Electronics Engineering	45
Unit 2	Installation and Repair and Maintenance of LED and other Lights	45
Unit 3	Work Ethics, Quality, Sustainability and Safety	30
	Total Duration	120

Unit 1: Fundamentals of Electrical and Electronics Engineering

Sn	Learning Outcome	Theory (15 Hours)	Practical (30 Hours)	45
1.	Describe the duties and responsibilities of Junior Field Technician Home Appliances	<ul style="list-style-type: none"> Size and scope of electronic industry and its sub-sectors, Role and responsibilities of Junior Field Technician Home Appliances. 	<ul style="list-style-type: none"> List various home appliances, Group activity to demonstrate and operate different types of appliances such as LED, Fan, Iron, Cooler. 	5
2.	Describe the basic electrical engineering concepts	<ul style="list-style-type: none"> Electricity, Types of electricity – AC, DC Current, Voltage, Power, Resistance Measuring units of current, voltage and resistance, Potential and Potential difference, Electric Circuit, Open and Closed Circuit, Series and Parallel connections, Electrostatics, Laws of Electrostatics Switches, relay and fuse, 	<ul style="list-style-type: none"> Switch on/ off the electrical appliances such as electric fan, TV, Refrigerator and determine the presence of electricity. Read the voltage, current, resistance, power ratings of the appliances. List the measurement units of voltage, current, resistance, Identify the live, neutral and earth ports of power socket, List, identify and name the electrical components, Connect the electrical 	15

		<ul style="list-style-type: none"> • Concept of magnetic field, • Comparison between magnetic circuit and electric circuit, • Domestic wiring • Ohm's law • Kirchhoff's law • Faraday's law of electromagnetic induction, • Transformer, • AC motors, DC motors • Starter in motors 	<p>components in series and parallel combination</p> <ul style="list-style-type: none"> • List and detect the basic electrical faults, • Detect the problem with switch and earthing, • Verify the ohm's law by using ohm's experiment, • Verify the Kirchhoff's law by using experiment, • Verify Faraday's law of electromagnetic induction, • Identify AC motors, DC motors 	
3.	Describe the basic electronics engineering concepts	<ul style="list-style-type: none"> • Electronic components – active and passive components, • Color codes of resistors, • Types of capacitors, • Semiconductor, • PN Junction diode, • Forward and reverse bias characteristics of PN junction diode • Transistor, • Thermistor, • Integrated Circuits, • Electrical and Electronics symbols 	<ul style="list-style-type: none"> • List the active and passive components and draw their symbols, • Determine the value of resistance by using color code, • Determine the types of capacitor and its value, • Connect the electronic components in series and parallel combination, • Draw the symbol of PN junction diode and determine the name of terminals by observing the PN junction diode • Test the continuity of given diode using multimeter • Construct the circuit for forward and reverse bias of the diode and draw its characteristic curve • Determine the input and output voltage of a given transformer, • Demonstrate the working of LED, • Demonstrate to verify the transistor as a switch, • Demonstrate to verify the temperature resistance relationship of thermistor 	15
4.	Use tools, equipment and measuring instruments	<ul style="list-style-type: none"> • Common hands tools – Cutter, Scissors, Screwdriver, Combination Plier, • Measuring instruments – Phase Tester, Earth Tester, Watt Meter, Energy Meter, Multi-meter, 	<ul style="list-style-type: none"> • Group activity to use various hand tools, • Measure electrical quantities and test electronic component, • Calculate the current flowing through resistance, 	10

		Clamp Meter <ul style="list-style-type: none"> Measurement of AC, DC voltage and current using multi-meter Safety practices to use Tools, Equipment and Measuring instruments 	<ul style="list-style-type: none"> 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 	
			Total Duration in Hours	45

Unit 2: Installation and Repairing dysfunctional LED and Other Lights

Sn	Learning Outcome	Theory (15 Hours)	Practical (30 Hours)	45
1.	Install LED and other lights	<ul style="list-style-type: none"> Different types of light – LED Lights, CFL, Incandescent bulb, Fluorescent light, Halogen light, Features and functioning of lights, Types of LED lights – LET strip, LED tube, LED dimmer switches, Colour LED, Specificationis of various types of lights, Energy ratings (BEE) and consumption of various lights, Functioning of dimmer, filament, Pre-installation preparation, Hazards and prevention/ safety precautions while handling the appliances, Installation and testing of light, Post installation activity – billing and documentation, Operational guidelines. 	<ul style="list-style-type: none"> List the types of LED lights with its power rating, Draw the diagram of various LED lights and state their use, List the specifications of each type of light, List the preinstallation requirements, Group activity to install various types of LED lights, Testing the functionality of light after installation by swichig ON/OFF. 	15
2.	Diagnose faults in lights	<ul style="list-style-type: none"> Faults based on customer interaction, usage pattern and initial inspection, Basic tests – power supply, earth test power supply, internal check, Common issues and faults that may occur in an LED light, Faults due to electrical connections, Reasons for damage and 	<ul style="list-style-type: none"> List the faults based on customer interaction, usage pattern and initial inspection, Group activity to perform Basic tests – power supply, earth test power supply, internal check, Group activity to solder wires and make connections of loose wires to make them functional, Group activity to perform basic tests power supply, earth test 	15

		disfunctioning of light, <ul style="list-style-type: none"> Reasons for flickering, simming, sparking, Process of comparing actual voltage with the desired voltage to find out the damaged section of supply using multimeter, 	power supply, internal check, <ul style="list-style-type: none"> Group activity to detect basic electrical faults, Group activity to detect faults in lights, Group activity to check the LED light engine and repair/ replace it with the DC supply, if found faulty, 	
3.	Repair faulty LED lights	<ul style="list-style-type: none"> Importance of checking and replacing the damaged LED strips, Parameters to check and ensure functioning of the LED lights, Preventive Maintenance of LED lights, Maintenace tips of LED lights. 	<ul style="list-style-type: none"> Demonstrate to repair and replace the damaged component of LED light and ensure its functioning, Check the performance of LED light after repairing and re-assembling it, Demonstrate to fix LED light at the required fixture and check its functioning again, List and practice the maintenance of LED light. 	15
			Total Duration in Hours	45

Unit 3: Work Ethics, Quality, Substantiality and Safety

S _n	Learning Outcome	Theory (12 Hours)	Practical (18 Hours)	30
1.	Describe the process of achieving optimum productivity and quality	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Organisation safety and health policy, Appropriate Personal Protective Equipment (PPE) ESD precautions, Types of accident injury or hazard 	<ul style="list-style-type: none"> Group acticity to observe and follow organisation safety guidelines, Demonstrate the use of proper personal protective equipment (PPE) for safety Demonstrate to observe ESD precautions, Identify and report any accident 	08

			injury or hazard	
3.	Demonstrate the process of organizing waste management and recycling	<ul style="list-style-type: none"> Recyclable/non-recyclable and hazardous wastes, Different waste categories – dry, wet, recyclable, non-recyclable and single use plastic items, Different colours of dustbins to dispose waste, Waste management and waste disposal procedures, Methods of recycling as well as repairing and reusing electronic components, Effect of greening of jobs 	<ul style="list-style-type: none"> Identify and segregate recyclable/non-recyclable and hazardous wastes, Group activity to dispose waste as per the procedures, Demonstrate to use appropriate colours of dustbins to dispose waste, Group activity to recycle, repair and reuse electronic components, Participate in waste management and waste disposal workshops organised at workplace 	08
4.	Explain the importance of conserving resources	<ul style="list-style-type: none"> Efficient utilisation of material and water, Prevalent energy efficient devices, Common electrical problems, Cleaning of tools, machines and equipment Common practices of conserving electricity 	<ul style="list-style-type: none"> 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

GRADE X**Part A: Employability Skills**

Unit No.	Unit Name	Duration in Hours
Unit 1	Communication Skills – II	15
Unit 2	Self-management Skills – II	10
Unit 3	Information and Communication Technology Skills – II	15
Unit 4	Entrepreneurial Skills – II	10
Unit 5	Green Skills – II	10
	Total	60

Unit 1: Communication Skills – II

Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	20
1.	Demonstrate the knowledge of various methods of communication	<ul style="list-style-type: none"> Methods of communication Communication process and elements 	<ul style="list-style-type: none"> Role plays on communication process Group discussion on the effects of elements of communication cycle. 	02
2.	Describe the types of verbal communication	<ul style="list-style-type: none"> Verbal communication Types of verbal communication Advantages and disadvantages of verbal communication Mastering verbal communication 	<ul style="list-style-type: none"> Role play of a telephonic conversation Chart preparation on types of verbal communication Group discussion on the advantages and disadvantages of verbal communication Group activity on delivering a speech and practicing public speaking. 	02
3.	Demonstrate the knowledge of non-verbal communication	<ul style="list-style-type: none"> Non-verbal communication – Importance of non-verbal communication Types of non-verbal communication Visual communication 	<ul style="list-style-type: none"> Role play on non-verbal communication Group discussion and practice on how to avoid body language mistakes Group discussion on three methods of communication 	02
4.	Describe the communication cycle and importance of feedback	<ul style="list-style-type: none"> Communication cycle and importance of feedback Feedback Types of feedback Importance of feedback 	<ul style="list-style-type: none"> Role play on providing feedback Group activity on constructive feedback 	02
5.	Identify the barriers to effective communication	<ul style="list-style-type: none"> Effective communication Barriers to effective communication - <ul style="list-style-type: none"> Physical barriers 	<ul style="list-style-type: none"> Role play on barriers to effective communication Group practice on overcoming the barriers to effective 	03

		<ul style="list-style-type: none"> • Linguistic barrier • Interpersonal barriers • Organizational barriers • Culture barriers • Ways to overcome barriers to effective communication 	communication <ul style="list-style-type: none"> • Chart preparation on barriers to effective communication 	
6.	Demonstrate the knowledge of parts of speech	<ul style="list-style-type: none"> • Writing skills – Parts of speech • Capitalization • Punctuations • Basics of parts of speech • Supporting parts of speech <ul style="list-style-type: none"> • Article • Conjunctions • Prepositions • Interjections 	<ul style="list-style-type: none"> • Reading paragraph and sentences and identifying parts of speech • Group activity on sentence construction • Identifying nouns by guessing the name, place, animal, or thing 	02
7.	Write sentences	<ul style="list-style-type: none"> • Meaning of sentence • Parts of sentence <ul style="list-style-type: none"> • Subject • Verb • Object • Types of objects • Types of sentences <ul style="list-style-type: none"> • Active • Passive • Paragraphs 	<ul style="list-style-type: none"> • Making sentences using direct and indirect objects • Writing a paragraph using active and passive voice • Framing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative) 	02
Total Duration in Hours				15

Unit 2: Self-Management Skills – II

Sn	Learning Outcome	Theory (05 Hours)	Practical (05 Hours)	10
1.	Apply stress management techniques	<ul style="list-style-type: none"> • Stress management • Stress and Stress management techniques • Management technique • Ability to work independently • Emotional intelligence 	<ul style="list-style-type: none"> • Role Play on avoiding stressful situation, • Activity on listing stressful situations and discussing the stress management techniques like yoga, deep breathing exercises 	02
2.	Identify strengths and weaknesses of self	<ul style="list-style-type: none"> • Self-Awareness – Strength and Weakness Analysis • Knowing yourself • Strength and weakness analysis • Techniques for identifying strengths and weaknesses • Difference between interests and abilities 	<ul style="list-style-type: none"> • Group discussion on aim and goal in life • Perform a strength and weakness analysis • Group discussion on interests and abilities 	02
3.	Demonstrate the knowledge of self -	<ul style="list-style-type: none"> • Self-Motivation • Types of motivation 	<ul style="list-style-type: none"> • Group discussion on staying motivated 	02

	motivation	<ul style="list-style-type: none"> Qualities of self-motivated people Building self-motivation 	<ul style="list-style-type: none"> Activity on listing the ways to motivate oneself 	
4.	Set SMART goals	<ul style="list-style-type: none"> Self regulation – Goal setting, Goals and setting SMART Goals How to set SMART Goals, <ul style="list-style-type: none"> Specific Measurable Achievable Realistic Time bound 	<ul style="list-style-type: none"> Group activity on setting SMART goals Writing long- term and short-term goals Activity on listing the ways to surely set SMART goals 	02
5.	Demonstrate the knowledge of time management	<ul style="list-style-type: none"> Self-Regulation – Time Management Time management and its importance Example and non-example of time management Four steps for effective time management <ul style="list-style-type: none"> Organise Prioritise Control Track Tips for practicing the four steps of effective time management 	<ul style="list-style-type: none"> Preparing a list of activities to practice time management Discussion on how to manage time to reach school on time 	02
			Total Duration in Hours	10

Unit 3: Information And Communication Technology Skills – II

Sn	Learning Outcome	Theory (05 Hours)	Practical (10 Hours)	15
1.	Perform basic computer operations	<ul style="list-style-type: none"> Basics computer operations, Starting a computer - basic functions performed when a computer starts, login and logout, Shutting down a computer, Using keyboard, Using a mouse - Roll over or hover, Point and click, Drag and drop, Double click 	<ul style="list-style-type: none"> Demonstration on use of computers Group practice on using the keyboard 	07
2.	Perform basic file operations	<ul style="list-style-type: none"> Concept of basic file operations Files and folders Creating a file Creating a folder 	<ul style="list-style-type: none"> Demonstration and practice on creating a file and folder 	02
3.	Demonstrate computer care	<ul style="list-style-type: none"> Importance of care and maintenance of computers 	<ul style="list-style-type: none"> Making a chart on care and maintenance of computer 	03

	and maintenance	<ul style="list-style-type: none"> • Basic tips for taking care of devices • Cleaning computer devices • Preparing maintenance schedule for computers • Taking backup data • Scanning and cleaning viruses • Removing SPAM files 		
4.	Describe the importance of maintaining computer security and privacy	<ul style="list-style-type: none"> • Computer security and privacy • Reasons for security breach • Threats to computer • Protecting your data 	<ul style="list-style-type: none"> • Group work on preparing a chart of computer security and privacy 	03
			Total Duration in Hours	15

Unit 4: Entrepreneurial Skills – II

Sn	Learning Outcome	Theory (05 Hours)	Practical (05 Hours)	10
1.	Describe the meaning of entrepreneurship	<ul style="list-style-type: none"> • Entrepreneurship and society • Activities of entrepreneurs: <ul style="list-style-type: none"> • Fulfil customer needs • Use local materials • Help society • Create job • Share wealth • Lower price product 	<ul style="list-style-type: none"> • Group work on finding the problems in school campus and turning them into business opportunities 	03
2.	Identify the qualities and functions of an entrepreneur	<ul style="list-style-type: none"> • Qualities and functions of an entrepreneur • Qualities of an entrepreneur 	<ul style="list-style-type: none"> • Activity on self-assessment of entrepreneurial qualities • Brainstorming on solving a problem in their area • Taking an interview of an entrepreneur 	02
3.	Describe the myths and realities about entrepreneurship	<ul style="list-style-type: none"> • Misconceptions and myths about entrepreneurship 	<ul style="list-style-type: none"> • Group activity on identifying everyday heroes • Activity on interviewing the entrepreneurs • Group activity on making items and selling to someone 	02
4.	Describe entrepreneurship as a career option	<ul style="list-style-type: none"> • Entrepreneurship as a career option • Meaning of career • Ways of earning a living • Self-employment • Wage employment • Entrepreneurship career process – Enter, Survive, Grow 	<ul style="list-style-type: none"> • Brainstorming on entrepreneurship as a life option • Group discussion on The power of entrepreneurship 	03
			Total Duration in Hours	10

Unit 5: Green Skills – II

Sn	Learning Outcome	Theory (07 Hours)	Practical (03 Hours)	10
1.	Demonstrate the knowledge of green skills	<ul style="list-style-type: none"> Sustainable development, Importance of sustainable development, Problems related to sustainable development, Sustainable development Goals, Sustainable development initiatives, Sustainable process 	<ul style="list-style-type: none"> Group activity on creating garden in the school or planting tree saplings Group discussion on "How to prevent wastage" 	05
2	Describe the role of self in sustainable development	<ul style="list-style-type: none"> Our role in sustainable development Our role towards Sustainable Development <ul style="list-style-type: none"> Quality education Clean water and sanitation Affordable and clean energy Decent work and economic growth Reducing inequalities Creating sustainable cities and communities Responsible consumers and producers Protect life below water Protect life on land 	<ul style="list-style-type: none"> Group discussion on conservation and protection of environment Group activity on organising an art project using waste 	05
			Total Duration in Hours	10

Grade X, Part B: Vocational Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Installation, Operation, Repair and Maintenance of Electric Iron	30
Unit 2	Installation and Repair and Maintenance of Fan	45
Unit 3	Installation and Repair and Maintenance of Cooler	45
	Total Duration	120

Unit 1: Installation and Repair and Maintenance of Electric Iron

Sn	Learning Outcome	Theory (12 Hours)	Practical (18 Hours)	30
1.	Describe the installation and	<ul style="list-style-type: none"> Concept of heating in electric Iron, 	<ul style="list-style-type: none"> Draw the circuit diagram of heating coil of electric Iron, 	15

	operational process of Electric Iron	<ul style="list-style-type: none"> • Heating coil in electric Iron, • Insulation used in electric Iron, • Switches and controller used in electric Iron, • Earthing in electric Iron, • Thermostat used in Electric Iron, • Specificationis, features and functioning of Electric Iron, • Pre-installation checks, • Safety precautions while installing and handling Electric Iron, • Procedure to fix various accessories and parts of modern Electric Iron, • Testing of Electric Iron, • Temperature settings for various types of cloths, • Documentation and recording, • Features, utility and maintenance procedure of Electric Iron, • Operational guidelines. 	<ul style="list-style-type: none"> • Draw the circuit diagram of temperature controller of electric Iron, • Demonstrate the working of heating coil of electric Iron, • Demonstrate the connection of earthing of Electric Iron, • Demonstrate the process of disposing of the packaging material waste, • Demonstrate to shut off and On the Electric Iron and test the functionality, • Demonstrate to regulate temperature settings for various types of cloths, • Group activity to follow maintenance procedures while handling the Electric Iron. 	
2.	Describe the process of diagnosing, repairing and replacing the faulty module of Electric Iron.	<ul style="list-style-type: none"> • Faults based on customer interaction, usage pattern and initial inspection, • Common issues and faults that may occur in Electric Iron, • Faults in separate parts of Electric Iron, • Working of Electric Iron after connection is developed, • Performance test to check if the appliance is working or not 	<ul style="list-style-type: none"> • List the faults based on customer interaction, usage pattern and initial inspection, • Group activity to perform Basic tests – power supply, earth test power supply, internal check, • Group activity to detect faults in Electric Iron and it's parts, • Demonstrate to repair and replace the damaged component of Electric Iron and ensure its functioning, • Check the performance of Electric Iron after repairing 	15
			Total Duration in Hours	30

Unit 2: Installation and Repair and Maintenance of Fan

Sn	Learning Outcome	Theory (15 Hours)	Practical (30 Hours)	45
1.	Install the Fan	<ul style="list-style-type: none"> • Concept of Fan for air circulation, • Types of fan – table fan, ceiling fan, blade-less fan, • Energy rating and power 	<ul style="list-style-type: none"> • List the various parts of Fan, • Draw the diagram of table fan and ceiling fan indicating the various parts of fan, • Name the various parts of fan 	15

		<ul style="list-style-type: none"> consumption of various fans, Features and utility of Iron, Motor in Fan, Switches and controller in Fan, Insulation used in Fan, Safety and precautions for installation of Fan, Installation of ceiling Fan, Concept of earthing in fan Operational guidelines. Maintenance of motor, Preventive maintenance, Product warranty and after sales support 	<ul style="list-style-type: none"> and their connectivity, Group activity to fix various accessories and parts of Fan, Group activity to install ceiling fan, table fan, blade-less Fan, Demonstrate to shut off and On the Fan, Group activity to regulate the speed of Fan, Group activity to follow maintenance procedures of Fan. 	
2.	Diagnose faults in Fan	<ul style="list-style-type: none"> Faults based on customer interaction, usage pattern and initial inspection, Common issues and faults that may occur in Fan, Working of Fan after installation, Performance test to check working of Fan after installation, 	<ul style="list-style-type: none"> List the faults based on customer interaction, usage pattern and initial inspection, Group activity to perform Basic tests – power supply, earth test power supply, internal check, Group activity to detect faults in Fan and it's parts, 	15
3.	Repair or replace dysfunctional module in Fan	<ul style="list-style-type: none"> Procedure to replace dysfunctional module in Fan, Replacement of fan capacitor, Replacement of shaft, gasket, and blades of fan, Repairing of motor, Maintenance of motor, Repairing of blown out motor 	<ul style="list-style-type: none"> Group activity to replace dysfunctional module in Fan, Group activity to replace capacitor, shaft, gasket, and blades of fan, Demonstrate to repair dysfunctional module in Fan, Check the performance of Fan after repairing and replacement of part, 	15
			Total Duration in Hours	45

Unit 3: Installation and Repair and Maintenance of Cooler

Sn	Learning Outcome	Theory (15 Hours)	Practical (30 Hours)	45
1.	Install the Cooler	<ul style="list-style-type: none"> Concept of air cooling and circulation in Cooler, Types of Cooler – Desert Cooler, Tower Air Cooler, Window Air Cooler Different models of Cooler, their features and functionalities, Energy rating and power consumption of Cooler, 	<ul style="list-style-type: none"> List the various parts of Cooler, Identify the various types of Cooler, Group activity to compare the features of various types of Cooler, Draw the diagram of Cooler indicating its various parts, Group activity to fix various accessories and parts of Cooler, 	15

		<ul style="list-style-type: none"> Functioning of various electromechanical parts of the Cooler, Assembly and disassembly of Cooler, Hazards, their causes, prevention and safety while installation and repair of Cooler, Installation of Cooler, Operational guidelines. Maintenance of motor, Preventive maintenance, Product warranty and after sales support 	<ul style="list-style-type: none"> Group activity to assemble and dis-assemble a Cooler, Group activity to install and test the functionality of Cooler, Group activity to operate various buttons of Cooler, Group activity to observe safety measures while installation, operation and maintenance of a Cooler, Group activity to follow maintenance of Cooler. 	
2.	Diagnose faults in Cooler	<ul style="list-style-type: none"> Faults based on customer interaction, usage pattern and initial inspection, Common issues and faults that may occur in Cooler, Components of Cooler Problems in motors, pump, shaft, gaskets, Frequently occurring faults – Improper working of blades, heating of motor, Performance test to check working of Cooler, Reporting faults, Technicians service manual for testing, 	<ul style="list-style-type: none"> Group activity to diagnose the fault based on customer interaction, usage pattern and initial inspection Group activity to perform basic tests – power supply, earth test, Group activity to detect basic electrical faults, faults in switch, earthing, Identify and name the various components of Cooler, Group activity to diagnose problem in motors, pump, shaft, gaskets, Group activity to detect each component for fault diagnosis, 	15
3.	Repair or replace dysfunctional module in Cooler	<ul style="list-style-type: none"> Procedure to repair/ replacement of dysfunctional component in Cooler, Procedure for replacement of shaft, gasket, and blades of Cooler, Procedure for replacement of shaft, gasket, and blades of Cooler, Procedure for replacement of pump and blown out motor, Procedure for cleaning and maintenance of Cooler, Precautions to be taken to avoid recurrence of problem, 	<ul style="list-style-type: none"> Group activity to replace external parts of Cooler, Group activity to replace internal dysfunctional component of Cooler, Group activity to replace shaft, gasket, and blades of Cooler, Group activity to replace dysfunctional pump, and blown out motor Check the performance of Cooler after repairing and replacement of part, Maintenance of motor/replace fan capacitor 	15
			Total Duration in Hours	45

6. ORGANISATION OF FIELD VISITS

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

Visit a workshop or service center and observe the following: Location, Site, Home appliances, Parts of Appliances, Assembly, Installation, Repair and Maintenance of the appliances such as LED and other light, Electric Iron, Fan, Cooler. During the visit, students should obtain the following information from the owner or the supervisor :

1. Explain the use of appropriate tools, parts, relevant reference sheets, manuals and
2. documents.
3. Disposing the packaging material waste as per the company's norms.
4. Detect basic electrical faults such as improper/no earth, defective power cord, connector or internal wiring defect, short/ loose/open contacts, blown fuse
5. Inspect each module of the unit separately if the fault is not identified through basic tests.
6. Communicating effectively at the workplace.
7. Applying health and safety practices at the workplace.

7. LIST OF EQUIPMENT AND MATERIALS

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

Tools	Equipment	Material
<ul style="list-style-type: none"> • Phase tester • Screwdriver set • Nut driver set • Combination Plier • Spanner set • Electrical tape • Soldering kit • Drill machine • Measuring tape • Hacksaw • Hammer • Scissor 	<ul style="list-style-type: none"> • Multimeter • Clamp-meter • Personal Protective Equipment • Temperature meter • Cable Connector • Continuity Tester • Ohm's Law kit • Kirchhoff's Law kit • AC and DC motors • Regulated power supply kit 	<ul style="list-style-type: none"> • Electrical and electronic components: Resistor, capacitor, inductor, various diode, Bipolar Junction Transistor, transformer, starter, relay, contractor, Field Effect Transistor (FET), Integrated Circuit, Thermistor, Circuit breaker • Wire, Wiring layout • Colour code chart of resistor • Code chart of capacitor • Datasheet of Integrated Circuit • Printed Circuit Board, Sensor

Classroom Aids

Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop

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 Graduate in Science with Diploma in appropriate branch of Engineering/ Technology Desirable: Knowledge and skills of Installation, Repair and Maintenance of Home Appliances.	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 committee 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 Rashtriya Madhyamik Shiksha Abhiyan (RMSA). They are directly involved in teaching of vocational subjects and also serve as a link between the industry and the schools for arranging industry visits, On-the-Job Training (OJT) and placement.

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

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

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

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

The educational qualifications required for being a Vocational Teacher/Trainer for a particular job role are clearly mentioned in the curriculum for the particular NSQF compliant job role. The State should ensure that teachers / trainers deployed in the schools have relevant technical competencies for the NSQF qualification being delivered. The Vocational Teachers/Trainers preferably should be certified by the concerned Sector Skill Council for the particular Qualification

Pack/Job role which he will be teaching. Copies of relevant certificates and/or record of experience of the teacher/trainer in the industry should be kept as record.

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

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 and International level;
- Development of teaching-learning materials in the subject area;
- Efforts made in developing linkages with the Industry/Establishments;
- Efforts made towards involving the local community in Vocational Education
- Publication of papers in National and International Journals;
- Organisation of activities for promotion of vocational subjects;
- Involvement in placement of students/student support services.

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PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
(A constituent unit of National Council of Educational Research and Training, under Ministry of Education, Government of India)

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE: ASSISTANT PLUMBER-GENERAL

(QUALIFICATION PACK: Ref. Id. PSC/Q0102)

SECTOR: PLUMBING
Grades 09 and 10

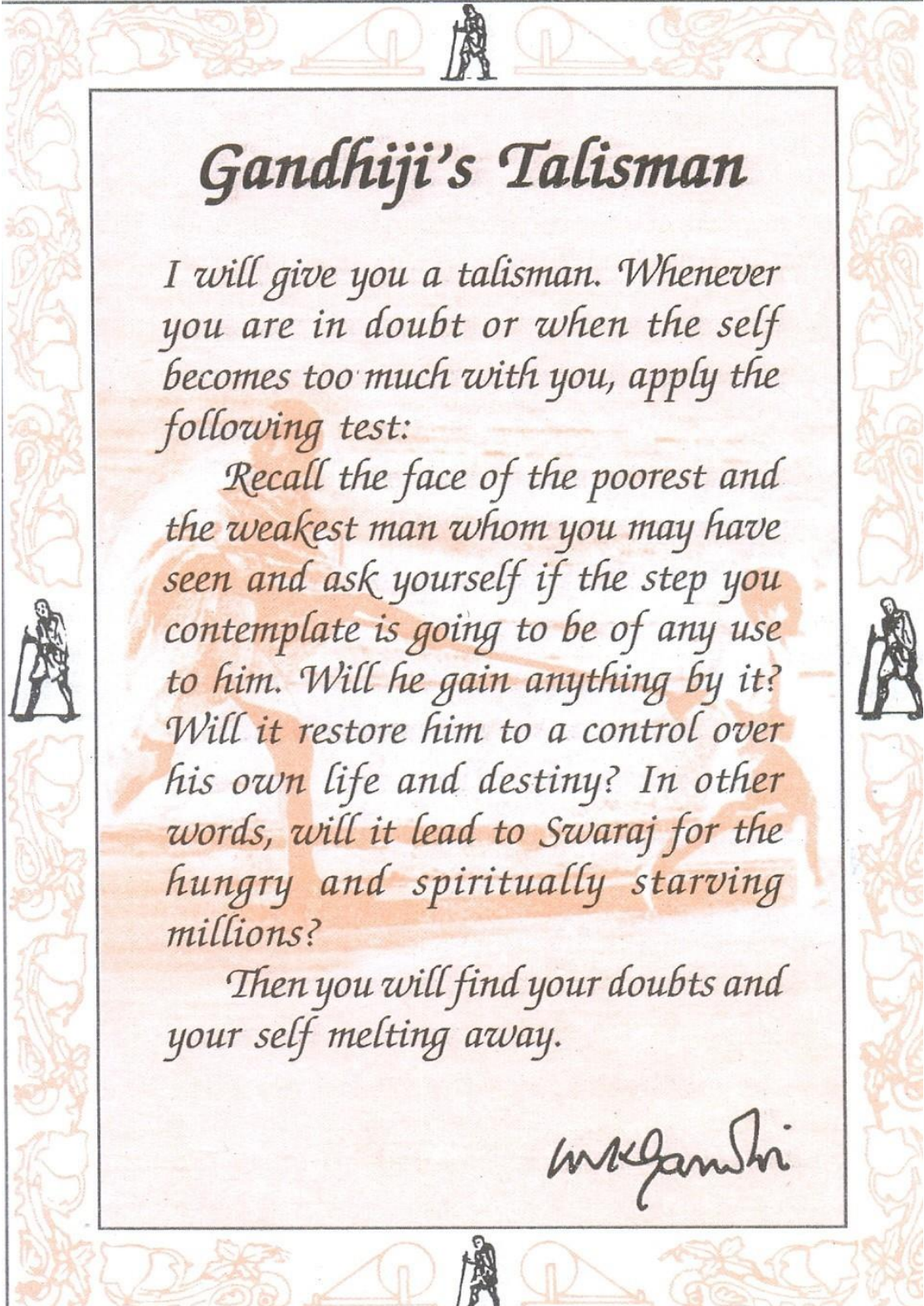


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Shyamla Hills, Bhopal-462002, M.P., India

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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.

MK Gandhi

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE: ASSISTANT PLUMBER-GENERAL

(QUALIFICATION PACK: Ref. Id. PSC/Q0102)

SECTOR: Plumbing

Classes 9 and 10



PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

Shyamla Hills, Bhopal- 462002, M.P., India

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**LEARNING OUTCOME BASED
VOCATIONAL CURRICULUM**

**Assistant Plumber–General,
January, 2023**

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Bhopal

FOREWARD

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. The curriculum has been developed for the vocational education programme introduced under the Centrally Sponsored Scheme of *Samagra Shiksha* of the Ministry of Education (*erstwhile, Ministry of Human Resource Development*) and is aligned to the National Skill Qualifications Framework (NSQF). The curricula for vocational courses are being developed under the project approved by the Project Approval Board (PAB) of '*Samagra Shiksha*', which is an overarching programme for the school education sector extending from pre-school to Grade 12.

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 Assistant Plumber-General. The curriculum has been developed for the secondary students of grades 09 and 10 and is aligned to the National Occupation Standards (NOSs) for the job role. 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 skill needs. The teaching-learning is to be done through interactive sessions in classrooms, practical activities in laboratories or workshops, projects, field visits, etc. and professional experience is to be provided through on-the-job training.

The curriculum has been developed and reviewed by a group of experts and their contributions are duly 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 Education Research and Training

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth is 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. In order to fulfil the growing aspirations of our youth and the demand for a skilled human resource, the Ministry of Education (erstwhile, Ministry of Human Resource Development (MHRD), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of School 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 with the responsibility to develop learning outcome- based curricula, student textbooks and e-learning material for job roles in various sectors.

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 society and the world of work. In order to honour its commitment to the nation, the PSSCIVE is developing learning outcome-based curricula with the involvement of faculty members and leading experts in the field. It is being done through the concerted efforts of leading academicians, professionals, policymakers, partner institutions, Vocational Education and Training (VET) 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. 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.

The success of this curriculum depends upon its effective implementation, and it is expected that the managers of vocational education programme, vocational educators, vocational teachers/trainers, and other stakeholders will make earnest efforts to provide better facilities, develop linkages with the industry or world of work and foster a conducive learning environment for the students for effectively transacting the curriculum and to achieve the learning outcomes as per the content of the curriculum document.

DEEPAK PALIWAL

Joint Director

PSS Central Institute of Vocational Education

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We are grateful to the Director, National Council of Educational Research and Training (NCERT) for his support and guidance. We also acknowledge the contributions of our colleagues at the NCERT, National Council for Vocational Education and Training (NCVET), National Skill Development Corporation (NSDC), Water Management and Plumbing Skill Council (WMPSC) and Sector Skill Council for Management and Entrepreneurship and Professional Skills for their academic support and cooperation in the development of Qualification file and curriculum.

We are grateful to Prof. Saurabh Prakash, Course Coordinator for his untiring efforts and contribution to the development of this learning outcome-based curriculum. The contribution made by Er. Hemant Wadikar, Dr. Abhay Kumar Jha, Ms. Pooja Sharma, Ms. Gunjan Aneja, Dr. Manoj Arya and his team, Industry Partner in the development of the curriculum for domain and non-domain skills is duly acknowledged.

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1. COURSE OVERVIEW

COURSE TITLE: Assistant Plumber - General

Assistant Plumber-General is an important job role in installation and repair of plumbing fittings and fixtures. Assistant Plumber-General is responsible for assists the plumber in installation and repair of plumbing fittings and fixtures. The job role holder organises and hands over tools, clears work area, cuts and bends pipes as per the specified dimensions. The individual also supports the plumber with other tasks as per instructions received. The person should be able to work independently on the assignment. The person should be comfortable in performing laborious work, should be a good listener, good at taking and following instructions, a good team player and result oriented with positive attitude.

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

- Communicate effectively with the customers;
- Identify the principal components of a computer system
- Identify and control hazards in the workplace that pose a danger or threat to their safety or health, or that of others.
- Demonstrate self-management skills.
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities.
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection.
- Identify and demonstrate safe use of hand and power tools/equipment used in plumbing;
- Gain insight into Assistant Plumber-General job role and its career progression
- Do installation of basic sanitary fixtures in housing, commercial and institutional setups
- Do repairing of basic plumbing systems, repair of pipes and sanitary fixtures in housing, commercial and institutional setups
- Maintenance and servicing of plumbing systems in housing, commercial and institutional setups
- Coordinating with the senior and other working team about communicating with colleagues and seniors in order to achieve smooth and hazard free work flow.
- Maintaining a healthy, safe and secure working environment. Work effectively in a team to deliver results at a Plumbing site

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

COURSE LEVEL: On completion of this course, a student can take up a course in the area of Plumbing sector.

COURSE DURATION:	400 hrs
	Grade 9: 200 hrs
	Grade 10: 200 hrs

Total	: 400 hrs

2. SCHEME OF UNITS

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

GRADE 9			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1 : Communication Skills- I	20	10
	Unit 2 : Self-management Skills- I	10	
	Unit 3 : Information and Communication Technology Skills- I	20	
	Unit 4 : Entrepreneurial Skills- I	15	
	Unit 5 : Green Skills- I	10	
	Total	75	10
Part B	Vocational Skills		
	Unit 1: Introduction to plumbing	15	30
	Unit 2: Tools for plumbing	25	
	Unit 3: Plumbing material and pipes, types and grades of pipe	20	
	Unit 4: Measurements and symbols used in plumbing	15	
	Unit 5 : Plumbing fittings, Joints and valves	20	
	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	20
	Total	200	100

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

GRADE 10			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1 : Communication Skills– II	20	10
	Unit 2 : Self-management Skills– II	10	
	Unit 3 : Information and Communication Technology Skills– II	20	
	Unit 4 : Entrepreneurial Skills– II	15	
	Unit 5 : Green Skills– II	10	
	Total	75	10
Part B	Vocational Skills		
	Unit 1: Basic building construction	15	30
	Unit 2: PIPES –Cutting, Threading, Joining and Testing of Pipelines	30	
	Unit 3: Plumbing and sanitary fixtures	20	
	Unit 4: Maintaining a healthy, safe and secure work environment	15	
	Unit 5: Optimum utilization of resources	15	
	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 or teaching aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

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

FIELD VISITS/ EDUCATIONAL TOUR

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

4. ASSESSMENT AND CERTIFICATION

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

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

KNOWLEDGE ASSESSMENT (THEORY)

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

WRITTEN TEST

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

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

Duration: 3 hrs

Max. Mark: 30

S. No.		No. of Questions			Marks
		Very Short Answer (1 mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	
	<i>Typology of Question</i>				
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

GRADE 9

PART A: EMPLOYABILITY SKILLS

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

Unit 1: Communication Skills - I

Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Duration (20 Hrs)
1. Demonstrate the knowledge of importance, elements and perspectives in communication	1. Introduction to communication process 2. Importance of communication 3. Elements of communication 4. Perspectives in communication 5. Effective communication	1. Role play on the communication process 2. Group discussion on the importance of communication and factors affecting perspectives in communication 3. Charts preparation on elements of communication 4. Asking students to write statements exemplify the use of the 7Cs (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete) for effective communication	02
2. Demonstrate the knowledge of verbal communication	1. Verbal communication 2. Types of verbal communication 3. Advantages and disadvantages of verbal communication 4. Public speaking	1. Role play of a phone conversation 2. Chart preparation on types of verbal communication 3. Group discussion on advantages and disadvantages of verbal communication 4. Delivering a speech and practicing public speaking by using 3P's	02

3. Demonstrate the knowledge of non-verbal communication	<ol style="list-style-type: none"> 1. Non-verbal communication 2. Importance of non-verbal communication 3. Types of non verbal communication 4. Visual communication 	<ol style="list-style-type: none"> 1. Role play on non-verbal communication 2. Group discussion and demonstration of Do's and Don'ts to avoid body language mistakes 3. Group discussion on three methods of communication 	02
4. Demonstrate the knowledge of basic writing skills	<ol style="list-style-type: none"> 1. Writing skills: Parts of speech 2. Using capitals 3. Punctuation 4. Basic parts of speech 	<ol style="list-style-type: none"> 1. Reading paragraphs and sentences and identifying parts of speech 2. Constructing and writing sentences by using parts of speech 3. Identifying nouns by guessing the name, place, animal, and thing 	02
5. Describe the parts and types of sentences	<ol style="list-style-type: none"> 1. Writing skills: Sentences 2. Parts of a sentence 3. Types of objects 4. Types of sentences – Active and Passive 5. Types of sentences, according to their purpose 6. Paragraphs 	<ol style="list-style-type: none"> 1. Framing and writing sentences using direct and indirect objects 2. Writing a paragraph using active and passive voice 3. Writing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative) 	02
6. Demonstrate the knowledge of pronunciation basics	<ol style="list-style-type: none"> 1. Pronunciation Basics 2. Speaking correctly 3. Phonetics 4. Types of sounds 	<ol style="list-style-type: none"> 1. Pronouncing words and identifying vowels, diphthongs and consonants 2. Practicing the pronunciation of words 	02
7. Demonstrate how to greet and introduce self	<ol style="list-style-type: none"> 1. Greetings and Introductions 2. Greetings 3. Types of greetings 4. Introducing yourself and others 	<ol style="list-style-type: none"> 1. Role-play on Formal and informal greetings 2. Role-play on introducing someone 3. Practice and discussion on how to greet different people. 	02

8. Answer questions that others ask about you	1. Talking about self 2. Filling a form	1. Practicing introducing yourself and 2. Practicing filling of forms 3. Role-play on Self Introduction	02
9. Asking questions according to a situation	1. Asking questions 2. Need for asking questions 3. Method for asking questions	1. Framing and writing questions (using Who, Where, When, What, Why and How) 2. Framing and writing questions (based on purpose of the question) 3. Discussing and guessing the personality using framed questions	02
10. Use the correct question words to ask open-ended and close-ended questions	1. Asking questions 2. Types of questions 3. Framing questions	1. Framing and writing open-ended and close-ended questions. 2. Group practice on framing question 3. Identifying open-ended and closed-ended questions.	02
Total			20

Unit 2: Self-management Skills – I

Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Duration (10 Hrs)
1. Describe the meaning and importance of self-management	1. Introduction to self-management and its components 2. Self-awareness 3. Self-confidence 4. Self-motivation 5. Positive thinking 6. Self-control 7. Problem solving 8. Personal hygiene and grooming 9. Team work 10. Time management 11. Goal setting	1. Group discussion on self-management skills 2. Performing activities to know how much aware are you about yourself. 3. Chart preparation on components of self-management	01

2. Identifying strength and weakness analysis	<ol style="list-style-type: none"> 1. Identifying strength and weakness 2. Knowing yourself 3. Strength and Weakness analysis 4. Difference between interests and abilities 	<ol style="list-style-type: none"> 1. Group discussion on aim and goal in life 2. Perform a strength and weakness analysis 3. Group discussion on interests and abilities 	01
3. Build self-confidence	<ol style="list-style-type: none"> 1. Self-confidence 2. Qualities of self-confident people 3. Building self-confidence 	<ol style="list-style-type: none"> 1. Role play on building self-confidence 2. Performing activities on building confidence through positive words 	02
4. Building the concept on positive thinking	<ol style="list-style-type: none"> 1. Positive thinking 2. Positive thinking and its importance 3. How to keep your thinking positive? 	<ol style="list-style-type: none"> 1. Story-telling 2. Role-play on following the class rules 3. Practicing saying positive words 4. Making a list of steps involved in self-reflection) on how you will follow positive attitude practices 5. Home activity on helping others, community service and social work 	02
5. Describe the concept and aspects of personal hygiene	<ol style="list-style-type: none"> 1. Personal hygiene 2. Three steps of personal hygiene <ul style="list-style-type: none"> • Care • Wash • Avoid 3. Essential steps of handwashing 	<ol style="list-style-type: none"> 1. Role-play on following personal hygiene steps 2. Discussion and follow up on personal hygiene practices 	02
6. Follow the guidelines for dressing and personal grooming	<ol style="list-style-type: none"> 1. Grooming 2. Grooming and its importance 3. Guidelines for dressing and grooming – 	<ol style="list-style-type: none"> 1. Role play on dressing and grooming standards 2. Self-reflection on dressing and 	02

	clothes, hair, face	grooming well	
Total			10

Unit 3: Information and Communication Technology Skills – I

Learning Outcome	Theory (06 hrs)	Practical (14 hrs)	Duration (20 Hrs)
1. Explain the role of Information and Communication Technology (ICT) in day-to-day life and the workplace	1. Introduction to Information and Communication Technology (ICT) 2. ICT at workplace 3. ICT at home	1. Group discussion on past, present, and future use of ICT 2. Preparations of posters on applications of ICT	02
2. Differentiate between the ICT tools and use of mobile apps	1. ICT tools smartphones and tablets I 2. Smartphones 3. Tablets 4. TV and Radio 5. Application or apps	1. Performing activities to get familiar with mobile devices	02
3. Differentiate between smartphones and tablets	1. ICT tools -smartphone and tablets II 2. Mobile device layout 3. Basic features of a mobile device 4. Home screen of mobile device 5. Basic gestures used	1. Performing activities to get familiar with the mobile device – use and applications of mobile devices	02
4. Describe the parts of computer and the computer peripherals	1. Parts of a computer and peripherals 2. Parts of a computer 3. Input devices 4. Output devices 5. Peripherals devices and their functions 6. Central Processing Unit (CPU) 7. Understanding Random Access Memory (RAM) and Read Only Memory (ROM) 8. Motherboard 9. Ports and connections	1. Chart preparation on components of a computer 2. Group activity on connecting devices to a computer	02
5. Demonstrate basic computer	1. Basic computer operations 2. Computer hardware	1. Group activity on use of computer 2. Group practice	02

operations	and software 3. Starting a computer 4. Log in and log out 5. Shutting down computer 6. Using the keyboard 7. Using a mouse	on using the keyboard	
6. Perform basic file computer operations	1. Performing Basic file operations 2. Need to perform basic file operations. 3. Files and folders - creating a file and using text editor Ubuntu	1. Group practice on creating a file.	02
7. Demonstrate the knowledge of internet and networking	1. Communication and Networking -Basics of Internet 2. Use of the Internet 3. Connecting to the Internet <ul style="list-style-type: none"> • Types of connection • Bandwidth • Internet browser 	1. Group discussion on the uses of the internet	02
8. Perform internet browsing	1. Communication and Networking – Internet Browsing 2. World Wide Web 3. Web page 4. Web browsers	1. Group practice on web browsing	02
9. Apply the knowledge of communication networking	1. Communication and Networking – Introductions to E-Mail 2. How does the E-mail work? 3. Email Id or address 4. Advantages of E-mail	1. Group discussion on using E-mail and its advantages	01
10. Create an Email account	1. Communication and Networking – Creating an E-mail account 2. Creating an E-mail account 3. Steps to open an E-mail account on Gmail	1. Group practice on creating and operating an e-mail account	01

11. Write an Email	1. Communication and Networking – Writing an E-mail 2. Writing an E-mail 3. Attaching a file to an E-mail 4. Managing folders	1. Group practice on writing an e-mail with attachments	01
12. Reply an Email	1. Communication and Networking – Receiving and Replying to an E-mail 2. Receiving Email 3. Replying to an Email 4. Forwarding Email 5. Deleting Email	1. Group practice on receiving and replying to an e-mail.	01
Total			20

Unit 4: Entrepreneurial Skills - I

Learning Outcome	Theory (06 hrs)	Practical (09 hrs)	Duration (15 Hrs)
1. Describe the concept of Entrepreneurship skills	1. What is Entrepreneurship? 2. Entrepreneurship 3. Enterprise	1. Group activity on guessing the Entrepreneur	04
2. Describe the role of entrepreneurship	1. Role of Entrepreneurship 2. Economic development 3. Social development 4. Improved standard of living 5. Optimal use of resources 6. More benefits at lower prices - products and services at competitive prices	1. Group discussion on "A world without Entrepreneurs" 2. Role-play on roles of entrepreneurship	03
3. Describe the qualities of a successful entrepreneur	1. Qualities of a successful entrepreneur 2. Patience 3. Positivity 4. Hardworking 5. Confidence 6. Open to trial and error 7. Creativity and innovation	1. Role-play on appearing for an interview 2. Group activity on interactions with entrepreneurs	02

4. State the characteristics of entrepreneurship	<ol style="list-style-type: none"> 1. Distinguishing characteristics of entrepreneurship and wage employment 2. Characteristics of entrepreneurship 3. Wage employment 4. Benefits of entrepreneurship 	<ol style="list-style-type: none"> 1. Group activity on identifying characteristics of enterprise 2. Discussion on advantages of entrepreneurship over wage employment 	03
5. Identify the type of business activity	<ol style="list-style-type: none"> 1. Types of business activities 2. Product business 3. Service business 4. Hybrid business 	<ol style="list-style-type: none"> 1. Group activity on identifying different types of products and services 	01
6. Differentiate between the product, service, and hybrid businesses	<ol style="list-style-type: none"> 1. Product, Service, and Hybrid Businesses 2. Types of product-based business 3. Manufacturing businesses 4. Trade businesses 	<ol style="list-style-type: none"> 1. Poster making on business activities around us 	01
7. Describe the entrepreneurship development process	<ol style="list-style-type: none"> 1. Entrepreneurship 2. Development Process 3. Steps of starting a business <ul style="list-style-type: none"> • Idea generation • Getting money and material • Understanding customer needs • Improving product/service 	<ol style="list-style-type: none"> 1. Group activity on Make-and-Sell business 	01
Total			15

Unit 5: Green Skills - I

Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Duration (10 Hrs)
1. Demonstrate the knowledge of society and environment	1. Society and Environment 2. Natural resources 3. Renewable and Non-renewable resources 4. Types of pollutions 5. Climate change 6. Harmful radiation 7. Natural disaster 8. Saving the environment: What can you do? 9. Reduce, reuse and recycle 10. Actions for saving the environment	1. Group activity on listing the factors influencing the environment 2. Group activity on listing the steps one can take to save the environment	05
2. Describe the meaning and importance of conserving natural resources	1. Conserving natural resources 2. Soil conservation 3. Water conservation 4. Energy conservation 5. Food conservation 6. Forest conservation	1. Group discussion on various ways of conserving natural resources	02
3. Describe the meaning and scope of sustainable development and green economy	1. Sustainable Development and Green Economy 2. Sustainable Development 3. Sustainable Development 4. Goals (SDGs) 5. Green growth 6. Green economy 7. Components of green economy 8. Skill development for the green economy 9. Green skills 10. Green jobs 11. Green projects	1. Group discussion on importance of green skills 2. Poster making on importance of green economy	03
Total			10

PART B: VOCATIONAL SKILLS

S. No.	Units	Duration (Hrs.)
1	Unit 1: Introduction to plumbing	15
2	Unit 2: Tools for plumbing	25
3	Unit 3: Plumbing material and pipes, types and grades of pipe	20
4	Unit 4: Measurements and symbols used in plumbing	15
5	Unit 5: Plumbing fittings, Joints and valves	20
	Total	95

Unit 1: Introduction to Plumbing

Learning Outcome	Theory (06 Hrs)	Practical (09 Hrs)	Duration (15 Hrs)
1. Overview of plumbing industry, scope of employment in this sector	1. Importance of plumbing 2. Job opportunities in plumbing	1. List the jobs related to water and plumbing sector	05
2. Responsibilities of an assistant plumber general	1. Responsibilities of assistant plumber general	1. List the responsibilities of assistant plumber general	05
3. Identifying the plumbing components	1. Meaning of plumbing 2. Sketches 3. Application and Uses	1. Visit to school building and see plumbing items 2. List the plumbing items in a school building	05
Total			15

Unit 2: Tools for Plumbing

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Identify the tools to be used	1. Importance of tools 2. Different types of tools used in plumbing Knowledge of tools such as Bench vice, Pipe, vice, Wrenches, Adjustable wrench, Water-pump, plies, Spanners, Ring spanner,	1. Identify the tools 2. Draw the figure of tools 3. Do the market survey to find out the manufacturer and cost of each tools	10

	Open ended spanner, Combination Spanners, Bi-hexagonal, ring spanner, Chisel, Hammer, Chain wrench, Rover jumper, Trowel, Screw driver, Hacksaw, Pipe cutter, Pipe bending, machine Threading dies, File, Pliers, Caulking tools, Drill machine, Drill bit Hangers, Measuring tape, Plumb rule and bob, Spirit level, Pipe threader		
2. Handling of tools	<ol style="list-style-type: none"> 1. Methods of holding the tools 2. Safety precautions to be taken while using the tools 3. Maintaining the plumbing tools and equipment's 	<ol style="list-style-type: none"> 1. Do practice of handling of tools using safety measures 2. Demonstrate the procedure of cleaning and maintaining, plumbing resources and tools 	10
3. Maintenance of tools	<ol style="list-style-type: none"> 1. Impact of factors such as temperature, pH (acidity levels), chemical composition, oxidation and ageing on plumbing tools, equipment, products and materials 2. Processes of prevention and their application used in the plumbing industry 	<ol style="list-style-type: none"> 1. Measuring the temperature of water 2. Reading the chemical composition of water 3. List the processes of prevention 	05
Total			25

Unit 3: Plumbing materials and pipes, types and grades of pipe

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Basic task to facilitate plumbing work	1. Importance of obtaining clarity about the task to be performed and following instruction and standard procedure. 2. Unpacking and checking of material as per manufacturer guideline	1. Demonstrate the process of unpacking of plumbing pipes, fittings fixtures and related materials.	10
2. Identify the plumbing materials used	1. Plumbing material and its importance 2. Method/technique of application of plumbing material Precautions to be used during application. 3. Various tools used for application of material	1. Enlist and identify the plumbing materials 2. Technique of application of the material 3. Demonstrate the application process	05
3. Identify the plumbing pipes	1. Importance and use of plumbing pipes 2. Types and quality of pipes. 3. Grades and characteristics of pipes 4. Cost of the pipes Precaution while handling the pipes	1. Survey the institute building and identify the plumbing pipes used 2. Market survey and make a list of plumbing pipes available. 3. Visit a construction site and see plumbing pipes with their uses at site	05
Total			20

Unit 4: Measurements and Symbol used in Plumbing

Learning Outcome	Theory (06 Hrs)	Practical (11 Hrs)	Duration (15 Hrs)
1. Identify the measurement systems used for plumbing	1. Importance of measurement 2. Types of measurement 3. Measurement tools 4. Conversion method	1. Convert different units in MKS to FPS system 2. Read and note down the values in measuring tools 3. Measure the dimensions and record the value of different plumbing materials	05
2. Measure the various quantity to be used in plumbing	1. Technique of measurement with tools 2. Important units of measurement	1. Measure the length 2. Measure the density 3. Measure the Pressure 4. Calculate the quantity of material as per data above recorded	05
3. Identify the various symbols used for plumbing work	1. Importance of symbols 2. Symbols used in plumbing 3. List the types of symbols	1. List the symbols for various plumbing items 2. Draw the symbols in drawing sheet 3. Identify the symbol details from drawing and note what it signifies or indicates	05
Total			15

Unit 5: Plumbing fittings, joints and valves

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Able to identify plumbing fittings	2. Importance and use of plumbing fittings 3. Types and properties of plumbing fittings. 4. Tools required for fixing the plumbing fittings 5. Procedure of fixing the fittings like Elbow, Gasket, Couplings, Union, Reducer, Tee, Nipple, Valve and Trap etc.	1. Identify the different types of plumbing fittings 2. Drawings /sketches of plumbing fittings 3. Reading and interpreting the sketches/basic working drawing 4. Market survey and identify the different type of plumbing fittings 5. Practice of fixing of plumbing fittings	10
2. Able to identify plumbing joints	1. Importance and use of plumbing joints 2. Types and properties of plumbing joints. 3. Tools required for fixing the plumbing joints 4. Procedure of fixing the joints	1. Identify the different types of plumbing joints 2. Drawings /sketches of plumbing joints 3. Reading and interpreting the sketches/basic working drawing 4. Market survey to identify the different type of plumbing materials available to assemble joints 5. Practice of fixing of plumbing joints	10
Total			20

GRADE 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 (12 hrs)	Practical (08 hrs)	Duration (20 Hrs)
1. Demonstrate the knowledge of various methods of communication	1. Methods of communication 2. Communication process and elements	1. Role-play on communication process 2. Group discussion on the effects of elements of communication cycle	05
2. Describe the types of verbal communication	1. Verbal communication 2. Types of verbal communication 3. Advantages and disadvantages of Verbal communication 4. Mastering Verbal communication	1. Role-play of a telephonic conversation 2. Chart preparation on types of verbal communication 3. Group discussion on the advantages and disadvantages of verbal communication 4. Group activity on delivering a speech and practicing public speaking.	02
3. Demonstrate the knowledge of non-verbal communication	1. Non-verbal communication 2. Importance of Non-verbal communication	1. Role play on non-verbal communication 2. Group discussion and practice on	02

	<ol style="list-style-type: none"> Types of non-verbal communication Visual communication 	<p>how to avoid body language mistakes</p> <ol style="list-style-type: none"> Group discussion on three methods of communication 	
4. Describe the communication cycle and importance of feedback	<ol style="list-style-type: none"> Communication cycle and importance of feedback Feedback Types of feedback Importance of feedback 	<ol style="list-style-type: none"> Role play on providing feedback Group activity on constructive feedback 	02
5. Identify the barriers to effective communication	<ol style="list-style-type: none"> Barriers to Effective communication Effective communication Barriers to effective communication <ul style="list-style-type: none"> Physical barriers Linguistic barrier Interpersonal barriers Organizational barriers Culture barriers Ways to overcome barriers to effective communication 	<ol style="list-style-type: none"> Role play on barriers to effective communication Group activity on overcoming barriers to effective communication Chart preparation on barriers to effective communication 	04
6. Demonstrate the knowledge of parts of speech	<ol style="list-style-type: none"> Writing skills – Parts of speech Capitalization Punctuations Basics of parts of speech Supporting parts of speech <ul style="list-style-type: none"> Article Conjunctions Prepositions Interjections 	<ol style="list-style-type: none"> Reading paragraph and sentences and identifying parts of speech Group activity on sentence construction Identifying nouns by guessing the name, place, animal, or thing 	03
7. Write sentences	<ol style="list-style-type: none"> Writing Skills - Sentences Parts of sentence Types of objects Types of sentences <ul style="list-style-type: none"> Active 	<ol style="list-style-type: none"> Making sentences using direct and indirect objects Writing a paragraph using active and passive voice 	02

	<ul style="list-style-type: none"> • Passive 5. Paragraphs	3. Framing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative)	
Total			20

Unit 2: Self-management Skills - II

Learning Outcome	Theory (05 hrs)	Practical (05 hrs)	Duration (10 Hrs)
1. Apply stress management techniques	1. Stress management 2. Stress and Stress management techniques 3. Management technique 4. Ability to work independently 5. Emotional intelligence	1. Role Play on avoiding stressful situation 2. Activity on listing stressful situations and discussing the stress management techniques like yoga, deep breathing exercises etc.	02
2. Identify strengths and weaknesses of self	1. Self-Awareness – Strength and Weakness Analysis 2. Knowing yourself 3. Strength and weakness analysis 4. Techniques for identifying strengths and weaknesses 5. Difference between interests and abilities	1. Group discussion on aim and goal in life 2. Perform a strength and weakness analysis 3. Group discussion on interests and abilities	02
3. Demonstrate the knowledge of self-motivation	1. Self-Motivation 2. Types of motivation 3. Qualities of self-motivated people 4. Building self-motivation	1. Group discussion on staying motivated 2. Activity on listing the ways to motivate oneself	02
4. Set SMART goals	1. Self-Regulation – Goal Setting 2. Goals and Setting SMART goals 3. How to set goals <ul style="list-style-type: none"> • Specific • Measurable • Achievable • Realistic 	1. Group activity on setting SMART goals 2. Writing long- term and short-term goals 3. Activity on listing the ways to surely set SMART goals	02

	<ul style="list-style-type: none"> • Time bound 		
5. Demonstrate the knowledge of time management	<ol style="list-style-type: none"> 1. Self-Regulation – Time Management 2. Time management and its importance 3. Example and non-example of time management 4. Four steps for effective time management <ul style="list-style-type: none"> • Organise • Prioritise • Control • Track 5. Tips for practicing the four steps of effective time management 	<ol style="list-style-type: none"> 1. Preparing a list of activities to practice time management 2. Discussion on how to manage time to reach school on time 	02
Total			10

Unit 3: Information and Communication Technology Skills– II

Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Duration (20 Hrs)
1. Perform basic computer operations	<ol style="list-style-type: none"> 1. Basics computer operations 2. Computer hardware and software 3. Starting a computer 4. Shutting down a computer 5. Using keyboard 6. Using a mouse <ul style="list-style-type: none"> • Roll over or hover • Point and click • Drag and drop • Double click 	<ol style="list-style-type: none"> 1. Demonstration on use of computers 2. Group activity on using the keyboard 	12

2. Apply basic file operations	1. Performing basic file operations 2. Basic File Operations 3. Files and folders <ul style="list-style-type: none"> • Creating a file • Creating a folder 	1. Practice of creating a folder	02
3. Demonstrate computer care and maintenance	1. Computer care and Maintenance 2. Importance of care and maintenance of computers 3. Basic tips for taking care of devices <ul style="list-style-type: none"> • Cleaning computer devices • Preparing maintenance schedule for computers • Taking backup data • Scanning and cleaning viruses • Removing SPAM files 	1. Group activity on preparing a chart on care and maintenance of computer	03
4. Describe the importance of maintaining computer security and privacy	1. Computer security and privacy 2. Computer security deals with protecting computer <ul style="list-style-type: none"> • Reasons for security breach • Threats to computer • Protecting your data 	1. Group activity on preparing an infographic chart on computer security and privacy	03
Total			20

Unit 4: Entrepreneurial Skills - II

Learning Outcome	Theory (06 hrs)	Practical (09 hrs)	Duration (15 Hrs)
1. Describe the meaning of entrepreneurship	1. Entrepreneurship and society 2. Activities of entrepreneurs: <ul style="list-style-type: none"> • Fulfil customer 	1. Group work on finding the problems in school campus and turning them into business	05

	needs <ul style="list-style-type: none"> • Use local materials • Help society • Create job • Share wealth • Lower price product 	opportunities	
2. Identify the qualities and functions of an entrepreneur	1. Qualities and functions of an entrepreneur 2. Qualities of an entrepreneur	1. Activity on self-assessment of entrepreneurial qualities 2. Brainstorming on solving a problem in their area 3. Taking an interview of an entrepreneur	03
3. Describe the myths and realities about entrepreneurship	1. Misconceptions and myths about entrepreneurship	1. Group activity on identifying everyday heroes 1. Activity on interviewing the entrepreneurs 2. Group activity on making items and selling to someone	04
4. Describe entrepreneurship as a career option	1. Entrepreneurship as a career option 2. Meaning of career <ul style="list-style-type: none"> • Ways of earning a living • Self-employment 3. Wage employment 4. Entrepreneur career process <ul style="list-style-type: none"> • Enter • Survive • Grow 	1. Brainstorming on entrepreneurship as a life option 2. Group discussion on The power of entrepreneurship	03
Total			15

Unit 5: Green Skills - II

Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Duration (10 Hrs)
1. Demonstrate the knowledge of green skills	1. Sustainable Development 2. Importance of sustainable development	1. Group activity on creating garden in the school or planting tree saplings 2. Group discussion on	05

	3. Problems related to sustainable development 4. Sustainable development Goals 5. Sustainable development initiatives 6. Sustainable process	"How to prevent wastage"	
2. Describe the role of self in sustainable development	1. Our role in sustainable development 2. Our role towards Sustainable Development <ul style="list-style-type: none"> • Quality education • Clean water and sanitation • Affordable and clean energy • Decent work and economic growth • Reducing inequalities • Creating sustainable cities and communities • Responsible consumers and producers • Protect life below water • Protect life on land 	1. Group discussion on conservation and protection of environment 2. Group activity on organizing an art project using waste	05
Total			10

PART B: VOCATIONAL SKILLS

S. No.	Units	Duration (Hrs.)
1	Unit 1: Basic Building Construction	15
2	Unit 2: PIPES –Cutting, Threading, Joining and Testing of Pipelines	30
3	Unit 3: Plumbing and sanitary fixtures	20
4	Unit 4: Maintaining a healthy, safe and secure work environment	15
5	Unit 5: Optimum utilization of resources	15
	Total	95

Unit 1: Basic Building Construction

Learning Outcome	Theory (05 Hrs)	Practical (10 Hrs)	Duration (15 Hrs)
1. Identify different components of a building structure	1. Components of Building structure, 2. Importance and use of building components in a structure 3. Purpose and utilization of various components of building structure	1. Identification of the components of building structure 2. Draw the components of building structure	05
2. Do the cutting and opening in building structure for fixing plumbing fixtures etc.	1. Method of cutting 2. Tools used for cutting Safety during cutting and opening	1. Do the marking on structure for cutting 2. Application of tools and equipment for cutting 3. Collect the waste material and dispose at proper place	10
Total			15

Unit 2: PIPES – Cutting, Threading, Joining, and Testing of Pipelines

Learning Outcome	Theory (12 Hrs)	Practical (18 Hrs)	Duration (30 Hrs)
1. Do the cuttings of pipeline as per requirement	1. Cutting procedure of pipes	1. Cutting practice of pipes as per dimension	05
2. Do the threading of pipeline as per requirement	1. Threading procedure of pipes	1. Threading practices of pipes	05
3. Do the joining practice of pipes as per requirement	1. Joining procedure of pipes	1. Joining practices of pipes	05
4. Do the bending practice of pipes as per requirement	1. Bending procedure of pipes	1. Bending practices of pipes	05
5. Do the forming, assembling and securing practice of pipes	1. Forming, assembling and securing procedure of pipes	1. Forming, assembling and securing practices of pipes	05

as per requirement			
6. Do the testing of pipelines after installation	1. Testing procedure of pipes	1. Testing practices of pipes	05
Total			30

Unit 3: Plumbing and sanitary fixtures

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Identify Plumbing and sanitary fixtures	1. Meaning of plumbing and sanitary fixtures 2. Use of plumbing and sanitary fixtures	1. Identification of the components of Plumbing and sanitary fixtures 2. Draw the Plumbing and sanitary fixtures	05
2. Identify type and Components of plumbing and sanitary fixtures	1. Type and components of plumbing and sanitary fixtures 2. Spacing/ height to be provided among different components of a Plumbing and sanitary fixtures	1. Make a list of Plumbing and sanitary fixtures in your area 2. Collect the drawing of various types of Plumbing and sanitary fixtures	07
3. Handle the tools used for Accessories and its type used for plumbing and sanitary fixtures	1. Specification and type of tools used	2. Demonstration of opening of different Plumbing and sanitary fixtures 3. Making the drawing of different Plumbing and sanitary fixtures 1. Making a list of safety equipment	05
4. Installation of different Plumbing and sanitary fixtures	1. Method of assembling and disassembling Plumbing and sanitary fixtures	2. Demonstrate the assembly of Plumbing and sanitary fixtures	03
Total			20

Unit 4: Maintaining a healthy, safe and secure work environment

Learning Outcome	Theory (06 Hrs)	Practical (09 Hrs)	Duration (15 Hrs)
1. Identify different types of hazards	1. Miss handling of power tool 2. Improper use of hand tool 3. Falls 4. Manual handling 5. Ladders	1. Safe handling practices, hand and power tool 2. Making of drawing of power tool	05
2. Follow the safety procedures	1. Safety check 2. Precaution at workshop 3. Reporting of injuries and disease and danger 4. Sign and symbols 5. Personnel protection equipment 6. Emergency services and first Aid	1. Identification of various types of hazard 2. Identification and Handling of personnel protective equipment 3. Handling of firefighting equipment	10
Total			20

Unit 5: Optimum utilization of resources

Learning Outcome	Theory (09 Hrs)	Practical (06 Hrs)	Duration (15 Hrs)
1. Practices and impact of inefficient utilization of material and water	1. Procedure of efficient utilization of material and water.	1. List the procedure of efficient utilization of material and water management.	02
2. Ways of efficiently managing material and water in the process	1. Efficient ways of managing material and water in the plumbing process	1. List the efficient ways of managing material and water in the plumbing process.	03

3. Application of Electricals equipment's used in plumbing	<ol style="list-style-type: none"> 1. Explain the basics of electricity. 2. Common electrical and thermal equipment used in a plumbing workplace. 3. Describe the use of prevalent energy efficient devices. 4. List indicators of common electrical problems. 5. Discuss common practices of conserving electricity. 6. Explain the importance of checking if the equipment. Machine is functioning normally before commencing work and ensuring it is rectified 	<ol style="list-style-type: none"> 1. List common electrical and thermal equipment used in a plumbing workplace. 2. List indicators of common electrical problems. 3. List the prevalent energy efficient devices used in plumbing. 4. List the common practices of conserving electricity. 	05
4. Efficient waste management	<ol style="list-style-type: none"> 1. Usage of different colours of dustbin 2. Recyclable and non-recyclable and hazardous waste 3. Efficient waste management practices 4. Common source of pollution 5. Common ways implied by organization to minimize waste generated from plumbing activities 	<ol style="list-style-type: none"> 1. Identify ways to optimize usages of water and other material in various tasks/activities/ process. 2. List the appropriate techniques to use energy/electricity in an optimum way. 3. Categorize waste into dry, wet, recyclable, non-recyclable and items of single-use plastics. 4. Employ effective waste management/recycling practices 	05
Total			15

6. ORANISATION OF FIELD VISITS

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace. Visit a Plumbing site and observe the following: Location, Site, Plumbing

site, Office building, newly constructed site, building store, Plumbing site. During the visit, students should obtain the following information from the owner or the supervisor of the Plumbing site:

1. Plumbing site activity being taken
2. Residential/Commercial project
3. Technology adopted
4. Type of material used
5. Sale procedure
6. Manpower engaged
7. Total expenditure of project
8. Total annual income
9. Profit/Loss (Annual)
10. Any other information

7. LIST OF EQUIPMENT AND MATERIALS

The tools, equipment and materials required for training are as follows:

1. Pipe wrench,
2. Parrot pliers,
3. Slide wrench,
4. Die set complete,
5. Hacksaw
6. Pipe vice,
7. Screw drivers set, D
8. Double Ended spanner set,
9. Allen Key set,
10. Drill bit set,
11. Drilling Machine,
12. Caulking tools
13. Hammers,
14. measuring tape, plumb,
15. L-Square,
16. Spirit Level,
17. Hydraulic Testing Machine,
18. Smoke Generator for testing of pipes and joints,
19. Pressure gauge,
20. Powered pipe threading machine,
21. Taps/faucets,
22. Shower head complete,
23. Sink,
24. Flushing tanks,
25. Urinal,
26. Urinal flush,
27. Bidet,
28. Bath tub,
29. Geyser,
30. Clamps and Hangers,
31. Pipes,
32. Fittings and accessories as required.

8. VOCATIONAL TEACHERS'/TRAINERS' QUALIFICATIONS 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:

S. No.	Qualification	Minimum Competencies	Age Limit
1.	B.Tech in Civil Engineering, Agricultural Engineering, Mechanical Engineering and B.Voc. (Bachelor in Vocation) from a recognized Institute /University, with at least 1-year work/teaching experience Or Diploma in Civil engineering / Agricultural Engineering/ Mechanical Engineering with 2 years work/teaching experience	<ul style="list-style-type: none"> Effective communication skills (oral and written) Basic computing skills. 	<ul style="list-style-type: none"> Minimum 18 Years Age relaxation to be provided as per Govt.rules.

These guidelines have been prepared with an aim to help and guide the States in engaging quality Vocational Teachers/Trainers in schools. Various parameters that need to be looked into while engaging the Vocational Teachers/Trainers are the 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 organisations involved in education and training must meet in order to be accredited by competent bodies to provide government-funded education and training/skills activities. This is applicable to all organizations offering NSQF-compliant qualifications.*

The educational qualifications required for being a Vocational Teacher/Trainer for a particular job role are clearly mentioned in the curriculum for the particular NSQF compliant job role. The State should ensure that teachers / trainers deployed in the schools have relevant technical competencies for the NSQF

qualification being delivered. The Vocational Teachers/Trainers preferably should be certified by the concerned Sector Skill Council for the particular Qualification Pack/Job role which he will be teaching. Copies of relevant certificates and/or record of experience of the teacher/trainer in the industry should be kept as record.

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

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

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

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

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

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

- (i) Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- (ii) Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- (iii) Make effective use of learning aids and ICT tools during the classroom sessions;
- (iv) 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;
- (v) 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;
- (vi) Identify the weaknesses of students and assist them in up-gradation of competency;
- (vii) Cater to different learning styles and level of ability of students;
- (viii) Assess the learning needs and abilities, when working with students with different abilities
- (ix) Identify any additional support the student may need and help to make special arrangements for that support;
- (x) 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 counselling activities conducted at Institutional, District and State level;
2. Adoption of innovative teaching and training methods;
3. Improvement in result of vocational students of Grade 10 or Grade 12;
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. Organisation of activities for promotion of vocational subjects;
11. Involvement in placement of students/student support services.

9. LIST OF CONTRIBUTORS

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