

DRONE PILOT

Job Role – Drone Technician

Class-11		Paper- I		Full Mark- 100	
Part -A	Employability Skills	No. of Theory classes	No. of Practical Classes	Max mark	
Unit - 1	Communication Skill-III	08	15	10	
Unit - 2	Self-Management Skill-III	05	12		
Unit - 3	Entrepreneur Skill-III	05	12		
	Total	18	39	10	
Part-B	Vocational Skill				
Unit - 1	Introduction to Drones	12	15	40	
Unit - 2	Types of Drones	08	12		
Unit - 3	Classification of Drones	05	03		
Unit - 4	Basic Components of a Drone	10	13		
Unit - 5	Knowledge on aviation Authority and Drone Utilization	8	12		
	Total	43	55	40	
Part-C	Practical Work				
	Practical Examination		06	15	
	Written test		01	10	
	Viva Voce		03	10	
	Total		10	35	
Part-D	Project Work/ Field Visit				
	Practical File/ Student Port folio		10	10	
	Viva Voce		05	05	
	Total		15	15	
	Grand Total	61	119	100	

Class-11		Paper- II		Full Mark- 100
Part -A	Employability Skills	No. of Theory classes	No. of Practical Classes	Max mark
Unit - 1	Basic Information and Communication Technology skills - III	10	27	10
Unit - 2	Green Skills - III	08	12	
	Total	18	39	10
Part-B	Vocational Skill			
Unit -1	Basics of Drone	10	15	40
Unit -2	Battery and Charger	08	13	
Unit -3	The Transmitter	12	15	
Unit -4	Routine Maintenance takes of Drone	9	08	
Unit - 5	Maintenance of Multirotor Drone	4	04	
	Theory	43	55	40
Part-C	Practical Work			
	Practical Examination		06	15
	Written test		01	10
	Viva Voce		03	10
	Total		10	35
Part-D	Project Work/ Field Visit			
	Practical File/ Student Port folio		10	10
	Viva Voce		05	05
	Total		15	15
	Grand Total	61	119	100

Council of Higher Secondary Education, Odisha

Employability Skills for All Job Roles

(Class XI) Paper -I

Unit 1: Communication Skills – III				
Sn	Learning Outcome	Theory	Practical	Hrs
1	Demonstrate knowledge of communication	<ul style="list-style-type: none"> • Introduction to communication • Importance of communication • Elements of communication • Perspectives in communication • Effective communication 	<ul style="list-style-type: none"> • Role-play on the communication process • Group discussion on the importance of communication and factors affecting perspectives in communication • Charts preparation on elements of communication • Classroom discussion on the 7Cs (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete) for effective communication 	03
2	Demonstrate verbal communication	<ul style="list-style-type: none"> • Verbal communication • Public Speaking 	<ul style="list-style-type: none"> • Role play of a phone conversation • Group activity on delivering a speech and practicing public speaking 	02
3	Demonstrate non-verbal communication	<ul style="list-style-type: none"> • 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 exercise and discussion on Do's and Don'ts to avoid body language mistakes • Group activity on methods of communication 	02
4	Demonstrate speech using correct pronunciation	<ul style="list-style-type: none"> • Pronunciation basics, • Speaking properly, • Phonetics, • Types of sounds 	<ul style="list-style-type: none"> • Group activities on practicing pronunciation 	01
5	Apply an assertive communication style	<ul style="list-style-type: none"> • Important communication styles, • Assertive communication, • Advantages of assertive communication, • Practicing assertive communication 	<ul style="list-style-type: none"> • Group discussion on communication styles, • Group discussion on observing and sharing communication styles 	03
6	Demonstrate the knowledge of saying no	<ul style="list-style-type: none"> • Steps for saying "No" • Connecting words 	<ul style="list-style-type: none"> • Group discussion on how to say 'No' 	02
7	Identify and use parts of speech in writing	<ul style="list-style-type: none"> • Capitalisation, • Punctuation, • Basic parts of speech, • Supporting parts of speech 	<ul style="list-style-type: none"> • Group activity on identifying parts of speech, • Writing a paragraph with punctuation marks, 	03

			<ul style="list-style-type: none"> Group activity on constructing sentences, Group activity on identifying parts of speech 	
8	Write correct sentences and paragraphs	<ul style="list-style-type: none"> Parts of a sentence Types of object Types of sentences Paragraph 	<ul style="list-style-type: none"> Activity on framing sentences Activity on active and passive voice Assignment on writing different types of sentences. 	02
9	Communicate with people	<ul style="list-style-type: none"> Geetings, Introducing self and others 	<ul style="list-style-type: none"> Role-play on formal and informal greetings, Role-play on introducing someone, Practice and group discussion on how to greet different people 	02
10	Introduce yourself to others and write about oneself	<ul style="list-style-type: none"> Talking about self Filling a form 	<ul style="list-style-type: none"> Practicing self-introduction and filling up forms Practicing self-introduction to others 	01
11	Develop questioning skill	<ul style="list-style-type: none"> Main types of questions, Forming closed and open ended questions 	<ul style="list-style-type: none"> Practice exercise on forming questions, Group activity on framing questions. 	01
12	Communicate information about family to others	<ul style="list-style-type: none"> Names of relatives, Relations 	<ul style="list-style-type: none"> Practice taking about family, Role-ply on talking about family members 	01
13	Describe habits and routines	<ul style="list-style-type: none"> Concept of habits and routines 	<ul style="list-style-type: none"> Group discussion on habits and routines Group activity on describing routines 	01
14	Ask or give	<ul style="list-style-type: none"> Asking for directions, 	<ul style="list-style-type: none"> Role-play on asking and giving 	01
	directions to others	<ul style="list-style-type: none"> Using landmarks 	<ul style="list-style-type: none"> directions, Identifying symbols used for giving directions 	
			Total Duration in Hours	25

Unit 2: Self-management Skills – III

Sn	Learning Outcome	Theory	Practical	Hrs
1.	Identify and analyze own strengths and weaknesses	<ul style="list-style-type: none"> Understanding self Techniques for identifying strengths and weaknesses Difference between interests and abilities 	<ul style="list-style-type: none"> Activity on writing aims in life Prepare a worksheet on interests and abilities 	03
2.	Demonstrate personal grooming skills	<ul style="list-style-type: none"> Guidelines for dressing and grooming Preparing a personal grooming checklist 	<ul style="list-style-type: none"> Role-play on dressing and grooming standards Self-reflection activity on various aspects of personal grooming 	04

3.	Maintain personal hygiene	<ul style="list-style-type: none"> Importance of personal hygiene Three steps to personal hygiene Essential steps of hand washing 	<ul style="list-style-type: none"> Role-play on personal hygiene Assignment on personal hygiene 	03
4.	Demonstrate the knowledge of working in a team and participating in group activities	<ul style="list-style-type: none"> Describe the benefits of teamwork, Working in a team 	<ul style="list-style-type: none"> Assignment on working in a team, Self-reflection on teamwork 	03
5	Develop networking skills	<ul style="list-style-type: none"> Benefits of networking skills, Steps to build networking skills 	<ul style="list-style-type: none"> Group activity on networking in action, Assignment on networking skills 	03
6	Describe the meaning and importance of self-motivation	<ul style="list-style-type: none"> Meaning of self-motivation, Types of motivation, Steps to building self-motivation 	<ul style="list-style-type: none"> Activity on staying motivated, Assignment on reasons hindering motivation 	03
7	Set goals	<ul style="list-style-type: none"> Meaning of goals and purpose of goal-setting, Setting SMART goals 	<ul style="list-style-type: none"> Assignment on setting SMART goals, Activity on developing long-term and short-term goals using SMART method 	03
8	Apply time management strategies and techniques	<ul style="list-style-type: none"> Meaning and importance of time management, Steps for effective time management 	<ul style="list-style-type: none"> Preparing checklist of daily activities 	03
			Total Duration in Hours	25

Unit 3: Information and Communication Technology Skills – III

Sn	Learning Outcome	Theory	Practical	Hrs
1.	Create a document on the word processor	<ul style="list-style-type: none"> Introduction to ICT, Advantages of using a word processor, Work with LibreOffice Writer 	<ul style="list-style-type: none"> Demonstration and practice of the following: Creating a new document Typing text Saving the text Opening and saving file in Microsoft word/Libre Office Writer 	02
2.	Identify icons on the toolbar	<ul style="list-style-type: none"> Status bar, Menu bar, Icons on the Menu bar, Multiple ways to perform a function 	<ul style="list-style-type: none"> Group activity on using basic user interface of LibreOffice writer Group activity on working with Microsoft Word 	02
3.	Save, close, open and print document	<ul style="list-style-type: none"> Save a document, Close a document, Open an existing document, Print a document 	<ul style="list-style-type: none"> Group activity on performing the functions for saving, closing and printing documents in LibreOffice Writer, Group activity on performing the functions to save, close and print documents 	02

4.	Format text in a document	<ul style="list-style-type: none"> • Change style and size of text • Align text, • Cut, Copy, Paste, • Find and replace 	<ul style="list-style-type: none"> • Group activity on formatting text in LibreOffice Writer, • Group activity on formatting text in Microsoft Word 	02
5.	Check spelling and grammar in a word document	<ul style="list-style-type: none"> • Use of spell checker, • Autocorrect 	<ul style="list-style-type: none"> • Group activity on checking spellings and grammar using LibreOffice Writer • Group activity on checking spellings and grammar using Microsoft Word 	02
6.	Insert lists, tables, pictures, and shapes in a word document	<ul style="list-style-type: none"> • Insert bullet list, • Number list, • Tables, • Pictures, • Shapes 	<ul style="list-style-type: none"> • Practical exercise of inserting lists and tables using LibreOffice Writer 	03
7.	Insert header, footer and page number in a word document	<ul style="list-style-type: none"> • Insert header, • Insert footer, • Insert page number, • Page count 	<ul style="list-style-type: none"> • Practical exercise of inserting header, footer and page numbers in LibreOffice Writer • Practical exercise of inserting header, footer and page numbers in Microsoft Word 	03
8.	Make changes by using the track	<ul style="list-style-type: none"> • Tracking option • Manage option 	<ul style="list-style-type: none"> • Group activity on performing track changes in LibreOffice 	04
	change option in a word document	<ul style="list-style-type: none"> • Compare documents 	<ul style="list-style-type: none"> Writer • Group activity on performing track changes in Microsoft Word 	
		•	Total Duration in Hours	20

Employability Skills (Class XI) Paper -II

Unit 4: Entrepreneurial Skills – III				
Sn	Learning Outcome	Theory	Practical	Hrs
1.	Differentiate between different kinds of businesses	<ul style="list-style-type: none"> • Introduction to entrepreneurship • Types of business activities 	<ul style="list-style-type: none"> • Role play on different kind of business around us 	03
2.	Describe the significance of entrepreneurial values	<ul style="list-style-type: none"> • Meaning of value, • Values of an Entrepreneur, • Case study on qualities of an entrepreneur 	<ul style="list-style-type: none"> • Role play on qualities of an Entrepreneur 	03
3.	Demonstrate the attitudinal changes required to become an entrepreneur	<ul style="list-style-type: none"> • Difference between the attitude of entrepreneur and employee 	<ul style="list-style-type: none"> • Interviewing employees and entrepreneurs 	03
4.	Develop thinking skills like an entrepreneur	<ul style="list-style-type: none"> • Problems of entrepreneurs • Problem-solving, • Ways to think like an entrepreneur 	<ul style="list-style-type: none"> • Group activity on identifying and solving problems 	04
5.	Generate business ideas	<ul style="list-style-type: none"> • The business cycle, • Principles of idea creation, • Generating a business idea, • Case studies 	<ul style="list-style-type: none"> • Brainstorming on generating a business ideas 	04
6.	Describe customer needs and importance of conducting a customer survey	<ul style="list-style-type: none"> • Understanding customer needs • Conducting a customer survey 	<ul style="list-style-type: none"> • Group activity to conduct a customer survey 	04
7.	Create a business plan	<ul style="list-style-type: none"> • Importance of business planning, • Preparing a business plan, • Principles to follow for growing a business, • Case studies 	<ul style="list-style-type: none"> • Group activity on developing a business plan 	04
			Total Duration in Hours	25
Unit 5: Green Skills – III				
Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	Hrs
1.	Describe the importance of the main sector of the green economy	<ul style="list-style-type: none"> • Meaning of ecosystem, food chain and sustainable development • Main sectors of the green economy- E-waste management, green transportation, renewal energy, green construction, and water management 	<ul style="list-style-type: none"> • Group discussion on sectors of green economy, Poster making on various sectors for promoting green economy 	06

2.	Describe the main recommendations of policies for the green economy	<ul style="list-style-type: none"> • Policies for a green economy 	<ul style="list-style-type: none"> • Group discussion on initiatives for promoting the green economy, • Writing an essay or a short note on the important initiatives for promoting green economy. 	03
3.	Describe the major green sector/area and the role of various stakeholders in the green economy	<ul style="list-style-type: none"> • Stakeholders in the green economy 	<ul style="list-style-type: none"> • Group discussion on the role of stakeholders in green economy • Preparation of posters on green sectors and their stakeholders • Making solar bulbs. 	03
4.	Identify the role of government and private agencies in the green economy	<ul style="list-style-type: none"> • Role of the government in promoting a green economy, • Role of private agencies in promoting green economy 	<ul style="list-style-type: none"> • Group discussion on the role of Government and Private Agencies in promoting a green economy. • Posters making on green sectors. 	03
			Total Duration in Hours	15

QUESTION PATTERN (For Theory Paper – I & Paper –II)

Type of Question	Marks
1. Very short answer type (Multiple Choice Question)	1 mark X 5=5
2. Short answer type questions(any 10) (Answer in one word or sentence)	1 mark X 10=10
3. Short answer type questions(any 10) (Answer in two or three sentences)	2 marks X 10 =20
4. <u>Long answer type questions(any 3)</u>	<u>5 marks X 3=15</u>

TOTAL

50

Part-B (Vocational Skills)

Paper-1

Unit-1

1. Introduction to Drones

- (i) What is a drone?
- (ii) History of evolution of drone.
- (iii) Drone category
 - a) By size (Nano drones, Micro drones, small drones, Medium drones, Large drones)
 - b) By Altitude (Low altitude drones, Medium altitude and High altitude drones)
 - c) By design (Fixed wing drone, Single rotor drone, Hybrid drone, Rotary wing drone)
- (iv) General rules for flying drones in India
 - a) Required drone equipment in India
 - b) Drone market in India
 - c) Application of drone technology

Unit-2

1. Types of Drones

- a) Fixed wing drone
- b) Types of fixed wing drone/ UAVS
- c) Fixed wing flight benefits
- d) Large fixed wing
- e) Medium fixed wing
- f) Small fixed wing
- g) Applications of fixed wing drones
- h) Advantages/ Disadvantages

2. Factors effecting selection of Drone

- a) KV- velocity constant
- b) Torque
- c) Efficiency
- d) Example scenario
- e) Choosing the right motor
- f) Current draw
- g) Temperature

Unit-3

Classification of Drones

1. Based on properties

- a) Fixed wing drones
- b) Single rotor drones
- c) Multi rotor drones
- d) Quadcopters
- e) Hexacopters
- f) Octacopters

2. Based on range

- a) Close range
- b) Short range
- c) Mid range

3. Based on power

Battery powered, fuel cell powered, gasoline/ petrol powered, solar powered and hybrid power drones

Unit-4

Basic components of a drone

- a) Frame
- b) Motors
- c) Propellers
- d) Flight controllers
- e) Battery
- f) Electronic speed controllers
- g) Radio transmitter & receiver
- h) Sensors
- i) On board camera / gimbal
- j) Propeller guards & landing gear

Unit-5

Knowledge on aviation authority & drone utilization

- a) Directorate General of civil aviation
- b) Remote pilot training organization
- c) Air traffic control
- d) Uses of drone in agriculture
- e) Uses of drone in industry
- f) Uses of drone in entertainment industry
- g) Drone use in emergency conditions
- h) Drone use in service orientated firms

PAPER I

Practical

1. Visit to the drone laboratory to identify different types of drones, such as Quadcopters , hexacopters, fixed wing drones, and hybrid models. Explain their unique features and use.
2. Make drones out of various locally available materials such as wood, thermocool, plastic fiver etc.
3. Visit to the drone technology lab to observe basic components and their functions.
4. Demonstrate drone components like frame, battery flight controllers, sensors, motors, and propellers in the laboratory.
5. Draw schematic diagram showing different components of the drone.
6. Conduct live demonstrations of various drones show causing their flight capabilities . Study the internals external components of drone, including motors, propellers , flight controllers , GPS modules , cameras and sensors.
7. Conduct a workshop where students stimulate a scenario involving drone regulators. They can play role as drone operators , regulators and law enforcement officers, learning about decision making process.
8. Organise lecture sessions on unmanned aircraft system rules and regulations for drone.
9. Slide presentation and poster preparation on the UAS rules and regulation for drones.
10. Discussion on proper handling and installation of components.

**SUB- DRONE PILOT
PAPER-II**

UNIT-1

BASICS OF DRONE

- Types and subtypes of Drone.
- Overall Past, Future and Present of Drone.
- Advantages and Limitations.
- Overview of main Components.
- Overview of Software and Data.
- Buying a Drone Vs Making One.
- Present & Future Applications.
- RC Commands.

UNIT-2

BATTERY AND CHARGER.

- Introduction.
- A Primer on Batteries.
- How to Change the battery.
- Battery terminal.
- Attaching the Battery to the frame.
- Improving battery endurance.

UNIT-3

THE TRANSMITTER

- Introduction
- Different types of Transmitter.
- Uses of Transmitter in drone.
- Main functions in Transmitter.

UNIT-4

ROUTINE MAINTANANCE TAKES OF DRONE.

- Clearing.
- Lubrication.
- Propeller replacement.
- Motor Maintenance.
- Preflight Checks.
- Post Flight Checks.

UNIT-5

MAINTENANCE OF MULTIROTOR DRONE.

- Configuration of Multirotor Drone.
 - ❖ Thrust Vectoring & Different thrust.
 - ❖ Storage of Drones.
 - ❖ Advanced maintenance.
 - I. Calibration
 - II. Replacement of Parts etc.

PRACTICAL PAPER-II

SUB-DRONE PILOT

- 1-Group discussion guidelines issued by DGCA for commercial use of drones remotely operated air craft.
2. Simulate scenarios where the drone encounters issues and practice safe emergency landing Procedures.
2. Group discussion on principles of aerodynamics (thrust, drag, lift, Gravity, Bernoulli's principle and Newton's Laws of motion).
4. Demonstrate the basic procedures for multirotor Drone maintenance.
- 5-Group discussion on flight hazards. Poster on Multirotor drone flight emergency procedures.
- 6- Practice emergency procedures during loss of link:
- 7-Practice emergency procedures to be followed in Case of loss of Power.
- 8-Practice emergency procedures for dealing with fly away, Loss of GPS, collision etc.
- 9- Test the Return to Home (RTH) function in various Scenarios to understand how the drone responds when it losses signal or encounters issues.

DRONE PILOT

Job Role – Drone Technician

Class-12		Paper- III		Full Mark- 100	
Part -A	Employability Skills	No. of Theory classes	No. of Practical Classes	Max mark	
Unit 1	Communication Skills – IV	08	15	10	
Unit 2	Self-management Skills – IV	05	09		
Unit 3	Entrepreneurial Skills – IV	05	09		
	Total	18	33	10	
Part-B	Vocational Skill				
Unit - 1	Transmitter and receiver in communication module	12	12	40	
Unit - 2	Flight Controller	10	15		
Unit - 3	Drone Sensors and Payloads	10	06		
Unit - 4	Principle of Flying and learning it with Drone Stimulator	10	15		
Unit - 5	Stimulators and Stimulations	05	09		
	Total	47	57	40	
Part-C	Practical Work				
	Practical Examination		06	15	
	Written test		01	10	
	Viva Voce		03	10	
	Total		10	35	
Part-D	Project Work/ Field Visit				
	Practical File/ Student Port folio		10	10	
	Viva Voce		05	05	
	Total		15	15	
	Grand Total	65	115	100	

Class-12		Paper- IV		Full Mark- 100
Part -A	Employability Skills	No. of Theo ry classes	No. of Practical Classes	Max mark
Unit - 1	Basic ICT Skills – IV	10	27	10
Unit - 2	Green Skills – IV	08	12	
	Total	18	39	10
Part-B	Vocational Skill			
Unit -1	Drone Regulation Worldwide	07	08	40
Unit -2	Drone Designing/Sector Specific Drone Design	08	13	
Unit -3	Mission Planner	12	15	
Unit -4	Drone Pilot Training	9	12	
Unit -5	Emergency Procedure in Drone Flying	07	07	
	Theory	43	55	40
Part-C	Practical Work			
	Practical Examination		06	15
	Written test		01	10
	Viva Voce		03	10
	Total		10	35
Part-D	Project Work/ Field Visit			
	Practical File/ Student Port folio		10	10
	Viva Voce		05	05
	Total		15	15
	Grand Total	61	119	100

Employability Skills (Class XII) Paper -I

Unit 1: Communication Skills – IV				
Sn	Learning Outcome	Theory (10 Hours)	Practical (15 Hours)	25 Hrs
1.	Demonstrate active listening skills	<ul style="list-style-type: none"> Active listening -listening skill, stages of active listening, Overcoming barriers to active listening 	<ul style="list-style-type: none"> Group discussion on the factors affecting active listening, Preparing posters of steps for active listening, Role-play on negative effects of not listening actively 	10
2.	Identify the parts of speech	<ul style="list-style-type: none"> Parts of speech – using capitals, punctuation, basic parts of speech, supporting parts of speech 	<ul style="list-style-type: none"> Group practice on identifying parts of speech Group practice on constructing sentences 	10
3.	Write sentences	<ul style="list-style-type: none"> Writing skills to practice the following: <ul style="list-style-type: none"> Simple sentence Complex sentence Types of object Identify the types of sentences <ul style="list-style-type: none"> Active and Passive sentences Statement/Declarative sentence Question/Interrogative sentence Emotion/Reaction or Exclamatory sentence Order or Imperative sentence 	<ul style="list-style-type: none"> Group activity on writing sentences and paragraphs, Group activity on practicing writing sentences in active or passive voice, Group activity on writing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative) 	05
			Total Duration in Hours	25
Unit 2: Self-management Skills – IV				
Sn	Learning Outcome	Theory (10 Hours)	Practical (15 Hours)	25 Hrs
1.	Describe the various factors influencing motivation and positive attitude	<ul style="list-style-type: none"> Motivation and positive attitude Intrinsic and extrinsic motivation Positive attitude – ways to maintain positive attitude Stress and stress management - ways to manage stress 	<ul style="list-style-type: none"> Role Play on avoiding stressful situation, Activity on listing negative situations and ways to turn it positive 	10
2.	Describe how to become result oriented	<ul style="list-style-type: none"> How to become result oriented? Goal setting – examples of 	<ul style="list-style-type: none"> Pair and share activities on the aim of life 	05

		result-oriented goals		
3.	Describe the importance of self-awareness and the basic personality traits, types and disorders	<ul style="list-style-type: none"> • Steps towards self-awareness • Personality and basic personality traits • Common personality disorders- <ul style="list-style-type: none"> • Suspicious • Emotional and impulsive • Anxious • Steps to overcome personality disorders 	<ul style="list-style-type: none"> • Group discussion on self awareness • Group discussion on common personality disorders • Brainstorming steps to overcome personality disorder 	10
			Total Duration in Hours	25

Unit 3: Information and Communication Technology Skills – IV

Sn	Learning Outcome	Theory (06 Hours)	Practical (14 Hours)	20 Hrs
1.	Identify the components of a spreadsheet application	<ul style="list-style-type: none"> • Getting started with spreadsheet – types of a spreadsheet, components of a worksheet, • Starting LibreOffice Calc • Creating a worksheet 	<ul style="list-style-type: none"> • Group activity on identifying components of spreadsheet in LibreOffice Calc 	02
2.	Perform basic operations in a spreadsheet	<ul style="list-style-type: none"> • Opening workbook and entering data – types of data, steps to enter data, editing and deleting data in a cell • Selecting multiple cells • Saving the spreadsheet in various formats • Closing the spreadsheet • Opening the spreadsheet. • Printing the spreadsheet. 	<ul style="list-style-type: none"> • Group activity on working with data on LibreOffice Calc 	03
3.	Demonstrate the knowledge of working with data and formatting text	<ul style="list-style-type: none"> • Using a spreadsheet for addition – adding value directly, adding by using cell address, using a mouse to select values in a formula, using sum function, copying and moving formula • Need to format cell and content • Changing text style and font size • Align text in a cell • Highlight text 	<ul style="list-style-type: none"> • Group activity on formatting a spreadsheet in LibreOffice Calc • Group activity on performing basic calculations in LibreOffice Calc. 	02

4.	Demonstrate the knowledge of using advanced features in spreadsheet	<ul style="list-style-type: none"> • Sorting data, • Filtering data, • Protecting spreadsheet with password 	• Group activity on sorting data in LibreOffice Calc	03
5.	Make use of the software used for making slide presentations	<ul style="list-style-type: none"> • Available presentation software • Stapes to start LibreOffice Impress • Adding text to a presentation 	<ul style="list-style-type: none"> • Group practice on working with LibreOffice Impress tools, • Group practice on creating a presentation in LibreOffice Impress 	02
6.	Demonstrate the knowledge to open, close and save slide presentations	• Open, Close, Save and Print a slide presentation	• Group activity on saving, closing and opening a presentation in LibreOffice Impress	01
7.	Demonstrate the operations related to slides and texts in the presentation	• Working with slides and text in a presentation- adding slides to a presentation, deleting slides, adding and formatting text, highlighting text, aligning text, changing text colour	• Group practice on working with font styles and types in LibreOffice Impress	04
8.	Demonstrate the use of advanced features in a presentation	<ul style="list-style-type: none"> • Advanced features used in a presentation, • Inserting shapes in the presentation, • Inserting clipart and images in a presentation, • Changing slide layout 	• Group activity on changing slide layout on LibreOffice Impress	03
			Total Duration in Hours	20

Employability Skills (Class XII) Paper -II

Unit 4: Entrepreneurial Skills – IV				
Sn	Learning Outcome	Theory	Practical	Hrs
1.	Describe the concept of entrepreneurship and the types and roles and functions entrepreneur	<ul style="list-style-type: none"> • Entrepreneurship and entrepreneur • Characteristics of entrepreneurship • Entrepreneurship-art and science • Qualities of a successful entrepreneur • Types of entrepreneurs • Roles and functions of an entrepreneur 	<ul style="list-style-type: none"> • Group discussion on the topic "An entrepreneur is not born but created". • Conducting a classroom quiz on various aspects of entrepreneurship. • Chart preparation on types of entrepreneurs • Brainstorming activity on What motivates an entrepreneur 	10
		<ul style="list-style-type: none"> • What motivates an entrepreneur • Identifying opportunities and risk-taking • Startups 		
2.	Identify the barriers to entrepreneurship	<ul style="list-style-type: none"> • Barriers to entrepreneurship, • Environmental barriers, • No or faulty business plan, • Personal barriers 	<ul style="list-style-type: none"> • Group discussion about "What we fear about entrepreneurship" • Activity on taking an interview of an entrepreneur. 	05
3.	Identify the attitude that make entrepreneur successful	<ul style="list-style-type: none"> • Entrepreneurial attitude 	<ul style="list-style-type: none"> • Group activity on identifying entrepreneurial attitude. 	05
4.	Demonstrate the knowledge of entrepreneurial attitude and competencies	<ul style="list-style-type: none"> • Entrepreneurial competencies • Decisiveness, • Initiative • Interpersonal skills-positive attitude, stress management • Perseverance • Organisational skills- time management, goal setting, efficiency, managing quality. 	<ul style="list-style-type: none"> • Playing games, such as "Who am I". • Brainstorming a business ideas • Group practice on "Best out of Waste" • Group discussion on the topic of "Let's grow together" • Group activity on listing stress and methods to deal with it like Yoga, deep breathing exercise. 	05
			Total Duration in Hours	25
Unit 5: Green Skills – IV				
Sn	Learning Outcome	Theory	Practical	Hrs

1.	Identify the benefits of the green jobs	<ul style="list-style-type: none"> • Green jobs • Benefits of green jobs • Green jobs in different sectors: <ul style="list-style-type: none"> • Agriculture • Transportation • Water conservation • Solar and wind energy • Eco-tourism • Building and construction • Solid waste management • Appropriate technology 	<ul style="list-style-type: none"> • Group discussion on the importance of green job, • Chart preparation on green jobs in different sectors. 	08
2	State the importance of green jobs	<ul style="list-style-type: none"> • Importance of green jobs in • Limiting greenhouse gas emissions, 	<ul style="list-style-type: none"> • Preparing posters on green jobs, • Group activity on tree 	07
		<ul style="list-style-type: none"> • Minimizing waste and pollution, • Protecting and restoring ecosystems, <p>Adapting to the effects of climate change</p>	<p>plantation.</p> <ul style="list-style-type: none"> • Brainstorming different ways of minimizing waste and pollution 	
			Total Duration in Hours	15

Unit 3: Green Skills – IV

1. Listing of green jobs and preparation of posters on green job profiles.
2. Prepare posters on green jobs.

QUESTION PATTERN (For Theory Paper – III& Paper –IV)

Type of Question	Marks
1. Very short answer type (Multiple Choice Question)	1 mark X 5=5
2. Short answer type questions(any 10) (Answer in one word or sentence)	1 mark X 10=10
3. Short answer type questions(any 10) (Answer in two or three sentences)	2 marks X 10 =20
4. Long answer type questions(any 3)	5 marks X 3=15
TOTAL	50

Reference book –

1. Fundamentals of Drone Technology

Author- I.V.S Yeswarth & Sridhar Kumar

2. Drone Technology for Beginners

Author-Dharan Nar & Radhika Kutecha

3. Basics of Unman Aerial Vehicle

Author- Gravit Pandya

4. Unleashing the Power of Drones

Author- Dr. Aradhana Deshmukh & Mr. Avinash Somatkar

PART-B
VOCATIONAL SKILL

Paper-IIT (THEORY)

Unit-1

Transmitters and Receivers and communication modules

1. a) Drone controller
- b) Frequency of the transmitter
- c) Radio receivers
- d) Drone batteries their types
- e) Components & assembly of multi rotor drone
- f) Application of multi rotor drone

Unit-2

2. Flight controller
 - a) What is flight controller?
 - b) Block diagram of the flight controller.
 - c) Description of the functioning of Block diagram of drone.
 - d) Distinguish between different flight controllers and compare them.
 - e) Drone flight controllers
 - i. K K 215 flight controller
 - ii. Features
 - iii. Installation
 - iv. Application
 - v. Advantages and Disadvantages
 - vi. Dji flight controllers
 - vii. Ardu pilot based controllers
 - viii. Open pilot and libre pilot controller
 - ix. Vector flight controllers

- x. Beta flight controllers
- xi. Holy bro flight controllers
- xii. Open pilot and librepilot controllers

Unit-3

3. Drone sensors and payloads

3.1 Basic electronic components

- i. Resistor
- ii. Capacitor
- iii. Transistor
- iv. Receiver
- v. Transmitter
- vi. Conductor
- vii. Semi conductor
- viii. Insulator

3.2. Different types sensors used in drone

3.2.1 Drone sensors

3.2.2 Drone payloads

3.2.3 Integration and impact

3.3 Demonstrates mounting of payload multi rotor drone

3.4 Interact visual images and videos captured by drones

3.5 Types of payloads

3.6 Features of payloads

3.7 Parts of payload

Unit-4

Principles of flying and learning it with drone stimulator

4.1 Forces of flight

4.1.1 Weight

4.1.2 Lift

4.1.3 Thrust

4.1.4 Drag

4.2 Principal axes and rotation of aerial systems

4.2.1 Longitudinal Axis

4.2.2 Lateral (Transverse) Axis

4.2.3 Perpendicular Axis

4.2.4 Propeller & Types

Unit-5

Stimulators and stimulation

- i. Introduction to stimulators
- ii. Different types of stimulators
- iii. Use of stimulation for drones
 - a) Software based stimulations
 - b) Hardware integrated stimulators
 - c) Full scale stimulators
 - d) Virtual reality stimulators (VRS)
 - e) Augmented Reality stimulators (ARS)
- iv) Flight stimulator (Basic and description etc.)
- v) Reason to use a drone flight stimulator

PAPER III Practical

1. Visit to the a drone technology lab for a demonstration of the function and use of arms , motors, propellers , electronic speed controller, flight controllers etc.
2. Identify different kinds of primary and secondary sensors, mounted on multi rotor drone.
3. Identify different kind sof flight controller, Block diagram and comparison them .
4. Allowing students to practice flying drones using flight stimulators.
5. Visit to nearest agricultural field to explore applications of multi rotor drone.
6. Hands on training in land surveying and field mapping.
7. Write a short note on futuristic application of multirotor drone.
8. Visit to a drone laboratory for demonstration of safe drone flying on stimulators.
9. Use drone flight stimulators to teach students about different flight scenarios while adhering to regulations.
10. Visit toa drone laboratory and observe the following types of payloads , parts of payloads, load utilization, case study on payloads

SUB- DRONE PILOT

PAPER-IV

UNIT-1

DRONE REGULATION WORLDWIDE

- Describe Safety Regulation & Guideline.
- NPNT in Brief
- Do's and Don'ts for Safety.
- DGCA Regulation.
- Fly zones & No Fly zone.
- Requirements of Drone to get NPNT Certified.
- Latest updates on DGCA Regulation.

UNIT-2

DRONE DESIGNING/SECTOR SPECIFIC DRONE DESIGN.

- Frame Design.
- Propellers Design.
- Agriculture Drone.
- Emergency Response Drone.
- Mining Drone.
- Warehousing Drone.
- Delivery Drone.
- Monitoring & Patrolling.
- Heavy Lift Drone.
- Military Application Drone.

UNIT-3

MISSION PLANNER

- ❖ Creating a mission
- ❖ Processing a mission
- ❖ Clearing mission

UNIT-4

DRONE PILOT TRAINING.

- Drone Pilot License.
- Basic Principle of flying.
- Simulator based Training.
- Role of Pilot while flying a drone.
- Maintenance of Ground equipment's, Batteries and Payloads.
- Scheduled Servicing, Repair of equipment fault finding and Rectification.

UNIT-5

EMERGENCY PROCEDURES IN DRONE FLYING.

- I. Drone emergency and handling Procedure.
- II. Drone emergency Procedure's during loss of link.
- III. Drone emergency Procedure's during loss of Power.
- IV. Drone emergency Procedure's during loss of GPS, Collision etc.

**SUB DRONE PILOT
PRACTICAL-PAPER IV**

1-Planning to fly of multirotor Drone, based on the aerodynamics and Flight principles.

2- Practical session to learn basic manoeuvres of multirotor drones.

3-Visit to the field and practice Pre-flight Checks and operations.

4-On-site assessment for operation using a Checklist and adjusting the flight profile.

5-Practice session on checks to be performed for and post-landing of drone.

6- Hands on Practice on different flight manoeuvres and Patterns.

7-Poster representation on different flight Patterns Using multirotor drones.

8- Practice flying multiple drones simultaneously focussing on co-ordination and avoiding Collisions.

9- Maintain flight logs, including details such as location, altitude and flight duration as required by many regulatory authorities.

10. Practice drone flying through games. Fly a multirotor drone under the Supervision of Instructor. Fly a multirotor drone without the help of an instructor.