SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar-Kattankulathur –603203

DEPARTMENT OF AGRICULTURE ENGINEERING

QUESTIONBANK

VI SEMESTER

1902607-AGRICULTURAL WASTE MANAGEMENT

Regulation – 2019

Academic Year 2024 –2025

Prepared by

Mr.Dinesh .R,

Assistant Professor/Agriculture Engineering

UNIT-I: INTRODUCTION

Availability of different types of agriculture wastes - its overall characteristics - classification of agro wastes based on their characteristics- its recycling and utilization potential - current constraints in collection and handling of agricultural wastes - its environmental impact.

Q.NO	QUESTIONS PART-A	BTLEVEL	COMPETENCE
1.	What are the formidable challenges in waste?	BT-1	Remembering
2.	What is Agricultural waste as per Glossary of Environmental Statistics, UN (1997)?	BT-2	Understanding
3.	Define Agricultural waste.	BT-1	Remembering
4.	What is the economic value of agricultural waste processing?	BT-2	Understanding
5.	What are the different forms of agricultural waste?	BT-1	Remembering
6.	What are the types of Agro waste?	BT-4	Analyzing
7.	What are different types of agro-waste based on residue?	BT-2	Understanding
8.	What are general constituent of agro waste?	BT-1	Remembering
9.	What are primary constituent of food industrial waste?	BT-4	Analyzing
10.	Describe the characterization of rice production.	BT-3	Applying
11.	Discuss the effect of agro-waste over soil.	BT-1	Remembering
12.	What are the problems caused if the agro waste is not properly handled?	BT-3	Applying
13.	What do you understand from Agricultural Waste Management?	BT-2	Understanding
14.	What are the basic functions of Agricultural Waste Management?	BT-1	Remembering
15.	Make a keynote on generation of agriculture waste.	BT-4	Analyzing
16.	Mention the general waste treatment process of agro-waste.	BT-5	Evaluating
17.	What is utilization based on agricultural waste?	BT-2	Understanding
18.	What are the 3R's of waste management/	BT-4	Analyzing
19.	What is the concept behind minimize waste?	BT-2	Understanding
20.	What is Zero waste agriculture?	BT-4	Analyzing
21.	What are the 4 classification of waste?	BT-3	Applying
22.	What is agrochemical waste?	BT-6	Creating

23.	What are the classification systems of waste?	BT-3	Applying
24.	What is classification of agro-waste?	BT-1	Remembering
25.	What are agrochemicals used?	BT-2	Understanding
Q.NO	**QUESTIONS PART-B**	**BTLEVEL**	**COMPETENCE**
1.	Describe Agro industrial waste.	BT-2	Understanding
2.	Evaluate the Characterization of agricultural waste based on activity	BT-1	Remembering
3.	Describe the production in agricultural waste management.	BT-5	Evaluating
4.	Explain the collection process in Agricultural waste management system.	BT-3	Applying
5.	Describe briefly about transfer and storage in agricultural waste management	BT-5	Evaluating
6.	Explain treatment process in Agricultural waste management system.	BT-6	Creating
7.	What are various ways of utilization in Agricultural waste management system.	BT-1	Remembering
8.	Describe about Organic waste utilization.	BT-5	Evaluating
9.	Explain the waste hierarchy of waste management.	BT-4	Analyzing
10.	Describe the schematic flow of waste handling in dairy industry.	BT-4	Analyzing
11.	What is zero waste agriculture? List the merits and demerits of Zero waste agriculture	BT-2	Understanding
12.	Explain the waste handling of a sugar manufacturing industry.	BT-3	Applying
13.	Explain the applications of waste processed products in various activity and industry.	BT-2	Understanding
14.	Explain the waste generation cycle in a rice production industry.	BT-1	Remembering
15.	Discuss the Impact of agricultural waste on the environment	BT-3	Applying
16.	Write a short notes on Recycling agricultural waste	BT-1	Remembering
17.	Write the Solutions for Overcoming Common Waste Management Challenges	BT-1	Remembering
Q.NO	**QUESTIONS PART-C**	**BTLEVEL**	**COMPETENCE**

1.	What are different types of agricultural waste and explain them in detail?	BT-2	Understanding
2.	What are various method of disposal of agricultural waste?	BT-1	Remembering
3.	Explain the agricultural waste management system its functions.	BT-3	Applying
4.	Explain zerowaste agriculture system with a schematic diagram.	BT-1	Remembering
5.	Explain the classification of agro-waste in deatil	BT-1	Remembering

UNIT-II: COMPOSTING

Definition- Solid waste suitable for composting – Methods of composting – vermicomposting – Mineralization process in composting - Biochemistry of composting – Factors involved – Infrastructure required – maturity parameters – value addition – application methods.

Q.NO	QUESTIONS PART-A	BTLEVEL	COMPETENCE
1.	Define composting.	BT-1	Remembering
2.	What are additional ingredients added to induce composting?	BT-4	Analyzing
3.	List the carbon composition of organic waste materials.	BT-1	Remembering
4.	What is ‘brown’ and ‘green’ in composting?	BT-1	Remembering
5.	What are categories of composting?	BT-4	Analyzing
6.	What are essential requirement of composting?	BT-5	Evaluating
7.	What are the criteria required for composting?	BT-2	Understanding
8.	List the types of composting.	BT-3	Applying
9.	What are the chemical in ADCO process?	BT-3	Applying
10.	What are the salient features of Indore method?	BT-3	Applying
11.	Name the additives used in Bangalore process.	BT-1	Remembering
12.	Give the standards for NADEP method of composting.	BT-1	Remembering
13.	What are the materials required for composting 1 tonne of coir pith?	BT-1	Remembering
14.	List the ways of confirming the end of composting process.	BT-4	Analyzing
15.	What are the benefits of compost?	BT-2	Understanding

16.	What are benefits of compost on soil physical characteristics?	BT-2	Understanding
17.	What are benefits of compost on soil chemical characteristics?	BT-1	Remembering
18.	List few of decomposers used in microorganism composting.	BT-4	Analyzing
19.	What is the average nutrient content in liquid manure?	BT-2	Understanding
20.	What are the materials to be avoided during composting?	BT-4	Analyzing
21.	What is solid waste composting?	BT-1	Remembering
22.	What type of waste is suitable for composting?	BT-4	Analyzing
23.	What is the definition of solid waste?	BT-6	Creating
24.	What is an example of compostable solid waste?	BT-2	Understanding
25.	What is solid waste process?	BT-1	Remembering
Q.NO	**QUESTIONS PART-B**	**BTLEVEL**	**COMPETENCE**
1.	Describe briefly different types of composting.	BT-4	Analyzing
2.	Explain ADCO process.	BT-5	Evaluating
3.	Explain Indore method of composting.	BT-5	Evaluating
4.	Give a brief note on Composting organic materials with high lignin content - coir pith	BT-4	Analyzing
5.	Specify the standards and describe about composting weeds	BT-4	Analyzing
6.	How will you identify the quality of compost?	BT-1	Remembering
7.	List with the significance of compost properties.	BT-6	Creating
8.	Give a brief note on soil health based on physical, chemical and biological characteristics.	BT-5	Evaluating
9.	Explain the procedure for preparation of liquid manure.	BT-2	Understanding
10.	Explain Composting organic materials with high lignin content - lime treatment	BT-1	Remembering
11.	What are the threshold limit of different components for odour formation during composting	BT-2	Understanding
12.	Explain Effective microorganism method.	BT-2	Understanding
13.	Write the Methods of composting	BT-3	Applying

14.	Write the Advantages of Composting	BT-3	Applying
15.	Discuss about Vermicompost Production Methodology	BT-4	Analyzing
16.	Write about Advantages of vermicompost	BT-5	Evaluating
17.	Nutritive value of vermicompost storing and packing of vermicompost	BT-6	Creating
Q.NO	**QUESTIONS PART-C**	**BTLEVEL**	**COMPETENCE**
1.	Explain the microbiology of composting.	BT-3	Applying
2.	Describe windrow composting and bin composting.	BT-4	Analyzing
3.	Explain the NADEP method of composting with neat sketches.	BT-5	Evaluating
4.	Explain vermi composting.	BT-6	Creating
5.	Detail about Materials for preparation of Vermicompost	BT-3	Applying

UNIT-III: BIOMASS BRIQUETTING

Definition – potential agro residues and their characteristics for briquetting – fundamental aspects and technologies involved in briquetting – economic analysis of briquetting – setting up of briquetting plant-appliances for biomass briquettes.

Q.NO	**QUESTIONS PART-A**	**BTLEVEL**	**COMPETENCE**
1.	What is the importance of biomass briquetting?	BT-1	Remembering
2.	What is biomass densification?	BT-2	Understanding
3.	What are various ways of representing briquetting?	BT-1	Remembering
4.	What is high pressure technologies used for briquetting?	BT-4	Analyzing
5.	What is current standard of biomass briquetting in India	BT-4	Analyzing
6.	What are potential agro residues	BT-2	Understanding
7.	What are characteristics required for biomass briquetting	BT-2	Understanding
8.	List the materials used in biomass briquetting	BT-4	Analyzing
9.	List various briquetting methods used in compaction	BT-1	Remembering
10.	Describe the concept of binding mechanism of densification	BT-5	Evaluating
11.	What are the briquetting technologies?	BT-2	Understanding
12.	What are the merits of biomass briquetting?	BT-4	Analyzing

13.	Express the unit operations of biomass preparation	BT-1	Remembering
14.	List the operations of rice husk.	BT-1	Remembering
15.	List the initial steps of setting up biomass briquetting plant.	BT-1	Remembering
16.	Describe the feasibility study of biomass briquetting plant setup.	BT-3	Applying
17.	What is manpower requirement of 2 machine unit with a productivity of 1.5tonnes/hour?	BT-2	Understanding
18.	What is economic analysis in biomass briquetting?	BT-1	Remembering
19.	List the application of biomass briquetting.	BT-4	Analyzing
20.	Which form of biomass briquetting is used in combustion of furnaces?	BT-4	Analyzing
21.	Write Briquetting Process	BT-1	Remembering
22.	Write about Cooling and Storage of briquettes	BT-3	Applying
23.	What is Briquetting machine	BT-3	Applying
24.	List the process involved in Preparation of raw materials in Briquetting	BT-2	Understanding
25.	What is Biomass Briquetting	BT-1	Remembering
Q.NO	**QUESTIONS PART-B**	**BTLEVEL**	**COMPETENCE**
1.	List the ash content for some of biomass types.	BT-5	Evaluating
2.	Describe the properties of solids that are important for densification.	BT-5	Evaluating
3.	Compare screw extruder and piston press.	BT-4	Analyzing
4.	Explain compaction characteristics of biomass and significance	BT-6	Creating
5.	Explain fumes exhaust system	BT-3	Applying
6.	What are factors considered in preheater system?	BT-4	Analyzing
7.	Explain the information flow structure of briquette production.'	BT-6	Creating
8.	What is the capacity or operation parameter of moist feed?	BT-5	Evaluating
9.	Describe a typical cost analysis of biomass briquette setup.	BT-4	Analyzing
10.	Explain the initial steps for setting up of a briquette plant.	BT-4	Analyzing

11.	Explain the project implementation procedure of a briquette plant.	BT-2	Understanding
12.	List the capacity and infrastructural requirements of biomass briquette plant.	BT-4	Analyzing
13.	Describe the application of biomass briquette in the combustion of stoves	BT-3	Applying
14.	Describe the application of biomass briquette in the combustion of furnace	BT-2	Understanding
15.	Short notes on Raw materials for briquetting	BT-6	Creating
16.	Write about Uses for Briquettes and limitations	BT-4	Analyzing
17.	Discuss about Necessary requirements to start a briquette production unit	BT-6	Creating
Q.NO	**QUESTIONS PART-C**	**BTLEVEL**	**COMPETENCE**
1.	Explain material process in biomass briquetting	BT-3	Applying
2.	Explain an ideal briquetting plant to conduct material energy balance	BT-4	Analyzing
3.	Explain economic analysis in biomass briquetting	BT-5	Evaluating
4.	Explain the procedure for setting up a briquetting plant.	BT-6	Creating
5.	Detail Briquetting Technologies	BT-3	Applying

UNIT-IV: BIOCHAR PRODUCTION

Definition - characteristics of agro wastes suitable for Biochar production – Methods of Biochar production – fast and slow pyrolysis – characteristics of Biochar – role of Biochar in soil nutrition and carbon sequestration.

Q.NO	**QUESTIONS PART-A**	**BTLEVEL**	**COMPETENCE**
1.	Define Biochar	BT-1	Remembering
2.	What are potentials of biochar?	BT-1	Remembering
3.	What is biochar fertilizer mix effect on crops?	BT-2	Understanding
4.	What is Leibig law of minimum?	BT-4	Analyzing
5.	Define law of diminishing return.	BT-4	Analyzing
6.	What is conversion efficiency of biochar?	BT-1	Remembering

7.	What are different methods of biochar production?	BT-4	Analyzing
8.	Compare pyrolysis with combustion.	BT-2	Understanding
9.	What are the materials produced by biomass processing?	BT-2	Understanding
10.	What are effects of biochar on soil?	BT-2	Understanding
11.	What is relationship between soil carbon and climate change?	BT-4	Analyzing
12.	What is the biomass issues based on energy?	BT-1	Remembering
13.	What is rate of biochar application?	BT-3	Applying
14.	What are the sources of biomass for biochar?	BT-4	Analyzing
15.	What are major challenges of biochar on sustainability?	BT-2	Understanding
16.	What is temperature suited for biochar production?	BT-2	Understanding
17.	What is GSBC project?	BT-4	Analyzing
18.	What are the applications of biochar compost?	BT-5	Evaluating
19.	Define biochar mulching.	BT-2	Understand
20.	List the benefits of biochar.	BT-1	Remembering
21.	What are the characteristics of good biochar?	BT-1	Remembering
22.	How is biochar produced from agricultural waste?	BT-2	Understanding
23.	What is characterization of biochar?	BT-5	Evaluating
24.	What are the conditions for biochar production?	BT-1	Remembering
25.	What are the parameters of biochar quality?	BT-4	Analyzing
Q.NO	**QUESTIONS PART-B**	**BTLEVEL**	**COMPETENCE**
1.	What are the sources of biomass for biochar? Give their significance.	BT-5	Evaluating
2.	What is energy conversion rout of biomass?	BT-1	Remembering
3.	What are the chemical properties of different types of biochar?	BT-2	Understanding
4.	Describe the effect of biochar on soil health.	BT-2	Understanding
5.	List the factors and their impact on soil because of biochar.	BT-4	Analyzing
6.	Explain Combustion of biochar.	BT-1	Remembering

7.	Describe the process of gasification of biomass	BT-2	Understanding
8.	Explain the general procedure of pyrolysis.	BT-3	Applying
9.	What are the classifications of pyrolysis methods?	BT-5	Evaluating
10.	Describe with flow diagram of the bio oil production by pyrolysis.	BT-5	Evaluating
11.	Describe different methods of biochar application.	BT-4	Analyzing
12.	Explain the biochemical method of conversion of agricultural waste	BT-4	Analyzing
13.	List out the benefits of biochar on agriculture.	BT-4	Analyzing
14.	Explain the biochar lifecycle analysis.	BT-1	Remembering
15.	Discuss the Classification of pyrolysis methods	BT-3	Applying
16.	Classify the Biochar production systems.	BT-5	Evaluating
17.	Write about the Stages of Pyrolysis	BT-4	Analyzing
Q.NO	**QUESTIONS PART-C**	**BTLEVEL**	**COMPETENCE**
1.	Explain the methods of biochar preparation.	BT-3	Applying
2.	What are different thermochemical methods of conversion of biomass?	BT-4	Analyzing
3.	Describe the application of biogas with a flow diagram at different level.	BT-5	Evaluating
4.	Explain the fermentation process with its applications	BT-6	Creating
5.	Write about Biochar production techniques utilizing biomass waste	BT-3	Applying

UNIT-V: BIOGAS AND BIO ETHANOL PRODUCTION

Screening of suitable lingo cellulosic substrate for biogas production -determination of bio-energy potential of agro-waste by estimating total solids - volatile solids - Calorific value- per cent total carbohydrates, moisture, lignin and cellulosic contents – preparation of feed stocks for anaerobic bio- digestion – types of digesters – factors affecting - nutrient value and utilization of biogas slurry. Ethanol production from lingo cellulosic wastes - Processing of Biomass to Ethanol – pre - treatment – fermentation – distillation.

Q.NO	**QUESTIONS PART-A**	**BTLEVEL**	**COMPETENCE**
1.	What is biogas?	BT-1	Remembering
2.	How biogas is produced from agricultural waste?	BT-3	Applying
3.	What is chemical composition of biogas from agrowaste?	BT-2	Understanding

4.	What is principle on biogas conversion?	BT-2	Understand
5.	What are the different apparatus used in biogas production from agro waste?	BT-6	Creating
6.	What are the uses of biogas?	BT-6	Creating
7.	What are the factors affecting yield and production of biogas?	BT-4	Analyzing
8.	What are the stages of anaerobic digestion?	BT-2	Understanding
9.	What are the different methods of operation of biogas unit?	BT-4	Analyzing
10.	What are different types of digester?	BT-4	Analyzing
11.	List the different components considered in the biogas system.	BT-1	Remembering
12.	What is UASBR?	BT-2	Understanding
13.	What is gas production capacity of various dung?	BT-2	Understanding
14.	What is bio ethanol?	BT-6	Creating
15.	List top five ethanol producers in world from agrowaste.	BT-2	Understanding
16.	Write the chemical reaction for bioethanol production.	BT-2	Understanding
17.	What are the raw material used for bioethanol production	BT-1	Remembering
18.	What is the various mix of ethanol with gasoline or diesel fuels?	BT-4	Analyzing
19.	What are the social impacts of bioethanol?	BT-4	Analyzing
20.	What is the future developments based on bioethanol?	BT-2	Understanding
21.	What is the difference between biogas and bio ethanol?	BT-5	Evaluating
22.	How is ethanol produced in biogas?	BT-1	Remembering
23.	How is biogas used in agriculture?	BT-2	Understanding
24.	What is the process of lignocellulosic ethanol production?	BT-4	Analyzing
25.	What is the pretreatment of biomass for ethanol production?	BT-1	Remembering
Q.NO	**QUESTIONS PART-B**	**BTLEVEL**	**COMPETENCE**
1.	Explain the procedure of biogas production?	BT-5	Evaluating
2.	Explain the biogas cycle from the organic wastes.	BT-4	Analyzing
3.	Explain ethanol production from the agro waste.	BT-1	Remembering

4.	What is the chemical composition of biogas?	BT-2	Understanding
5.	List the advantages and disadvantages of using biogas.	BT-2	Understanding
6.	Give the specification of general features of biogas.	BT-4	Analyzing
7.	Draw the flow diagram of agro waste conversion by anaerobic digestion.	BT-5	Evaluating
8.	Explain fixed dome digester with sketch.	BT-2	Understanding
9.	Explain biogas production from sludge of sewage treatment plant.	BT-3	Applying
10.	Explain bioethanol production.	BT-2	Understanding
11.	Explain the conversion of starch to ethanol with block diagram.	BT-5	Evaluating
12.	What are the properties of bio ethanol?	BT-5	Evaluating
13.	List the advantages of bioethanol n produced from agro waste.	BT-4	Analyzing
14.	What are the disadvantages and the concerns considered in the bioethanol process	BT-1	Remembering
15.	Write about Mechanics of the transesterification process	BT-5	Evaluating
16.	Detail about bioethanol production from lignocellulosic biomass	BT-2	Understanding
17.	Write about the factors affecting the biogas production	BT-3	Applying
Q.NO	**QUESTIONS PART-C**	**BTLEVEL**	**COMPETENCE**
1.	Explain dispersion growth digester in detail with sketches if any	BT-3	Applying
2.	Explain floating gasholder and bag digester with its principle.	BT-4	Analyzing
3.	Explain biogas cycle	BT-5	Evaluating
4.	Explain the biogas production from the domestic agrowaste	BT-6	Creating
5.	Details the Biodiesel Production using Flow chart	BT-3	Applying