SRM VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF AGRICULTURE ENGINEERING

QUESTION BANK

VI SEMESTER

1902607–AGRICULTURAL WASTE MANAGEMENT

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Prepared by

Mr. T. R. Banu chander, Assistant Professor/ Agriculture

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SUBJECT : 1902607–AGRICULTURAL WASTE MANAGEMENT

SEM / YEAR :VI/ III

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.

PART - A

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-1	Remembering
3.	Define Agricultural waste.	BT-1	Remembering
4.	What is the economic value of agricultural waste processing?	BT-1	Remembering
5.	What are the different forms of agricultural waste?	BT-1	Remembering
6.	What are the types of Agro waste?	BT-1	Remembering
7.	What are different types of agro-waste based on residue?	BT-2	Understanding
8.	What are general constituent of agro waste?	BT-2	Understanding
9.	What are primary constituent of food industrial waste?	BT-2	Understanding
10.	Describe the characterization of rice production.	BT-2	Understanding
11.	Discuss the effect of agro-waste over soil.	BT-3	Applying
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-3	Applying
14.	What are the basic functions of Agricultural Waste Management?	BT-4	Analyzing
15.	Make a keynote on generation of agriculture waste.	BT-4	Analyzing
16.	Mention the general waste treatment process of agro-waste.	BT-4	Analyzing
17.	What is utilization based on agricultural waste?	BT-5	Evaluating
18.	What are the 3R's of waste management/	BT-5	Evaluating
19.	What is the concept behind minimize waste?	BT-6	Creating
20.	What is Zero waste agriculture?	BT-6	Creating

PART – B

1.	Describe Agroindustrial waste.	BT-1	Remembering
2.	Evaluate the Characterization of agricultural waste based on activity	BT-1	Remembering
3.	Describe the production in agricultural waste management.	BT-1	Remembering
4.	Explain the collection process in Agricultural waste management system.	BT-1	Remembering

5.	Describe briefly about transfer and storage in agricultural waste management	BT-2	Understanding
6.	Explain treatment process in Agricultural waste management system.	BT-2	Understanding
7.	What are various ways of utilization in Agricultural waste management system?	BT-2	Understanding
8.	Describe about Organic waste utilization.	BT-3	Applying
9.	Explain the waste hierarchy of waste management.	BT-3	Applying
10.	Describe the schematic flow of waste handling in dairy industry.	BT-3	Applying
11.	What is zero waste agriculture? List the merits and demerits of Zerowaste agriculture	BT-4	Analyzing
12.	Explain the waste handling of a sugar manufacturing industry.	BT-4	Analyzing
13.	Explain the applications of waste processed products in various activity and industry.	BT-5	Evaluating
14.	Explain the waste generation cycle in a rice production industry.	BT-6	Creating

PART-C

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

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.

PART - A

1.	Define composting.	BT-1	Remembering
2.	What are additional ingredients added to induce composting?	BT-1	Remembering
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-1	Remembering
6.	What are essential requirement of composting?	BT-1	Remembering
7.	What are the criteria required for composting?	BT-2	Understanding
8.	List the types of composting.	BT-2	Understanding
9.	What are the chemical in ADCO process?	BT-2	Understanding
10.	What are the salient features of Indore method?	BT-2	Understanding
11.	Name the additives used in Bangalore process.	BT-3	Applying
12.	Give the standards for NADEP method of composting.	BT-3	Applying
13.	What are the materials required for composting 1 tonne of coir pith?	BT-3	Applying
14.	List the ways of confirming the end of composting process.	BT-4	Analyzing
15.	What are the benefits of compost?	BT-4	Analyzing

16.	What are benefits of compost on soil physical characteristics?	BT-4	Analyzing
17.	What are benefits of compost on soil chemical characteristics?	BT-5	Evaluating
18.	List few of decomposers used in microorganism composting.	BT-5	Evaluating
19.	What is the average nutrient content in liquid manure?	BT-6	Creating
20.	What are the materials to be avoided during composting?	BT-6	Creating

PART – B

1.	Describe briefly different types of composting.	BT-1	Remembering
2.	Explain ADCO process.	BT-1	Remembering
3.	Explain Indore method of composting.	BT-1	Remembering
4.	Give a brief note on Composting organic materials with high lignin content - coir pith	BT-1	Remembering
5.	Specify the standards and describe about composting weeds	BT-2	Understanding
6.	How will you identify the quality of compost?	BT-2	Understanding
7.	List with the significance of compost properties.	BT-2	Understanding
8.	Give a brief note on soil health based on physical, chemical and biological characteristics.	BT-3	Applying
9.	Explain the procedure for preparation of liquid manure.	BT-3	Applying
10.	Explain Composting organic materials with high lignin content - lime treatment	BT-3	Applying
11.	What are the threshold limit of different components for odour formation during composting	BT-4	Analyzing
12.	Explain Effective microorganism method.	BT-4	Analyzing
13.	Explain Anaerobic process of composting.	BT-5	Evaluating
14.	Explain aerobic process of composting.	BT-6	Creating

PART-C

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-3	Applying
4.	Explain vermi composting.	BT-2	Understanding

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.

PART - A

1.	What is the importance of biomass briquetting?	BT-1	Remembering
2.	What is biomass densification?	BT-1	Remembering

3.	What are various ways of representing briquetting?	BT-1	Remembering
4.	What is high pressure technologies used for briquetting?	BT-1	Remembering
5.	What is current standard of biomass briquetting in India	BT-1	Remembering
6.	What are potential agro residues	BT-1	Remembering
7.	What are characteristics required for biomass briquetting	BT-2	Understanding
8.	List the materials used in biomass briquetting	BT-2	Understanding
9.	List various briquetting methods used in compaction	BT-2	Understanding
10.	Describe the concept of binding mechanism of densification	BT-2	Understanding
11.	What are the briquetting technologies?	BT-3	Applying
12.	What are the merits of biomass briquetting?	BT-3	Applying
13.	Express the unit operations of biomass preparation	BT-3	Applying
14.	List the operations of rice husk.	BT-4	Analyzing
15.	List the initial steps of setting up biomass briquetting plant.	BT-4	Analyzing
16.	Describe the feasibility study of biomass briquetting plant setup.	BT-4	Analyzing
17.	What is manpower requirement of 2 machine unit with a productivity of 1.5tonnes/hour?	BT-5	Evaluating
18.	What is economic analysis in biomass briquetting?	BT-5	Evaluating
19.	List the application of biomass briquetting.	BT-6	Creating
20.	Which form of biomass briquetting is used in combustion of furnaces?	BT-6	Creating

PART – B

1.	List the ash content for some of biomass types.	BT-1	Remembering
2.	Describe the properties of solids that are important for densification.	BT-1	Remembering
3.	Compare screw extruder and piston press.	BT-1	Remembering
4.	Explain compaction characteristics of biomass and significance	BT-1	Remembering
5.	Explain fumes exhaust system	BT-2	Understanding
6.	What are factors considered in preheater system?	BT-2	Understanding
7.	Explain the information flow structure of briquette production.'	BT-2	Understanding
8.	What is the capacity or operation parameter of moist feed?	BT-3	Applying
9.	Describe a typical cost analysis of biomass briquette setup.	BT-3	Applying
10.	Explain the initial steps for setting up of a briquette plant.	BT-3	Applying
11.	Explain the project implementation procedure of a briquette plant.	BT-4	Analyzing
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-5	Evaluating
14.	Describe the application of biomass briquette in the combustion of furnace	BT-6	Creating

PART-C

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-3	Applying
4.	Explain the procedure for setting up a briquetting plant.	BT-2	Understanding

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.

PART – A

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-1	Remembering
4	What is Leibig law of minimum?	BT-1	Remembering
5	Define law of diminishing return.	BT-1	Remembering
6	What is conversion efficiency of biochar?	BT-1	Remembering
7	What are different methods of biochar production?	BT-2	Understanding
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-3	Applying
12	What is the biomass issues based on energy?	BT-3	Applying
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-4	Analyzing
16	What is temperature suited for biochar production?	BT-4	Analyzing
17	What is GSBC project?	BT-5	Evaluating
18	What are the applications of biochar compost?	BT-5	Evaluating
19	Define biochar mulching.	BT-6	Creating
20	List the benefits of biochar.	BT-6	Creating

PART B

1	What are the sources of biomass for biochar? Give their significance.	BT-1	Remembering
2	What is energy conversion rout of biomass?	BT-1	Remembering
3	What are the chemical properties of different types of biochar?	BT-1	Remembering
4	Describe the effect of biochar on soil health.	BT-1	Remembering
5	List the factors and their impact on soil because of biochar.	BT-2	Understanding
6	Explain Combustion of biochar.	BT-2	Understanding
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-3	Applying
10	Describe with flow diagram of the bio oil production by pyrolysis.	BT-4	Analyzing
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-5	Evaluating
14	Explain the biochar lifecycle analysis.	BT-6	Creating

PART – C

1	Explain the methods of biochar preparation.	BT-1	Remembering
2	What are different thermochemical methods of conversion of biomass?	BT-2	Understanding
3	Describe the application of biogas with a flow diagram at different level.	BT-3	Applying
4	Explain the fermentation process with its applications	BT-4	Analyzing

UNIT – V: BIOGAS AND BIOETHANOL 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.

PART – A

1	What is biogas?	BT-1	Remembering
2	How biogas is produced from agricultural waste?	BT-1	Remembering
3	What is chemical composition of biogas from agrowaste?	BT-1	Remembering
4	What is principle on biogas conversion?	BT-1	Remembering
5	What are the different apparatus used in biogas production from agro waste?	BT-1	Remembering
6	What are the uses of biogas?	BT-1	Remembering
7	What are the factors affecting yield and production of biogas?	BT-2	Understanding
8	What are the stages of anaerobic digestion?	BT-2	Understanding
9	What are the different methods of operation of biogas unit?	BT-2	Understanding
10	What are different types of digester?	BT-2	Understanding
11	List the different components considered in the biogas system.	BT-3	Applying
12	What is UASBR?	BT-3	Applying
13	What is gas production capacity of various dung?	BT-3	Applying
14	What is bio ethanol?	BT-4	Analyzing
15	List top five ethanol producers in world from agrowaste.	BT-4	Analyzing
16	Write the chemical reaction for bioethanol production.	BT-4	Analyzing
17	What are the raw material used for bioethanol production	BT-5	Evaluating
18	What is the various mix of ethanol with gasoline or diesel fuels?	BT-5	Evaluating
19	What are the social impacts of bioethanol?	BT-6	Creating
20	What is the future developments based on bioethanol?	BT-6	Creating

PART-B

1	Explain the procedure of biogas production?	BT-1	Remembering
2	Explain the biogas cycle from the organic wastes.	BT-1	Remembering
3	Explain ethanol production from the agrowaste.	BT-1	Remembering
4	What is the chemical composition of biogas?	BT-1	Remembering
5	List the advantages and disadvantages of using biogas.	BT-2	Understanding
6.	Give the specification of general features of biogas.	BT-2	Understanding
7	Draw the flow diagram of agrowaste conversion by anaerobic digestion.	BT-2	Understanding
8	Explain fixed dome digester with sketch.	BT-3	Applying
9	Explain biogas production from sludge of sewage treatment plant.	BT-3	Applying
10	Explain bioethanol production.	BT-4	Analyzing
11	Explain the conversion of starch to ethanol with block diagram.	BT-4	Analyzing
12	What are the properties of bio ethanol?	BT-4	Analyzing
13	List the advantages of bioethanol n produced from agrowaste.	BT-5	Evaluating
14	What are the disadvantages and the concerns considered in the bioethanol process	BT-6	Creating

PART – C

1.	Explain dispersion growth digester in detail with sketches if any	BT-1	Remembering
2.	Explain floating gasholder and bag digester with its principle.	BT-1	Remembering
3.	Explain biogas cycle	BT-2	Understanding
4.	Explain the biogas production from the domestic agrowaste	BT-2	Understanding