

National Testing Agency

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Biomass Characterization

Group Number :	1
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Biomass Characterization-1

Section Id :	512452775
Section Number :	1
Section type :	Online
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Number of Questions :	100
Number of Questions to be attempted :	100
Section Marks :	100
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	512452778
Question Shuffling Allowed :	Yes

**Question Number : 1 Question Id : 51245212041 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0**

Choose the correct statement related to biomass.

- A. Represents organic matter derived from living organism
- B. A source of green energy
- C. Oldest source of energy after the sun
- D. Renewable source of energy

Choose the **correct** answer from the options given below:

- 1. A, C and D only
- 2. A, B and D only
- 3. A, B, C, D
- 4. A and D only

Options :

- 51245236541. 1
- 51245236542. 2
- 51245236543. 3
- 51245236544. 4

Question Number : 2 Question Id : 51245212042 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following is included in primary biomass production?

- 1. Assimilation of organic material in heterotrophs
- 2. Assimilation of organic matter by autotrophs
- 3. Fossilization of organic materials
- 4. Decomposition of organic matter by various microbes

Options :

- 51245236545. 1
- 51245236546. 2
- 51245236547. 3
- 51245236548. 4

Question Number : 3 Question Id : 51245212043 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick out examples of biomass feedstock from the following-

- A. Agricultural residues
- B. Coal
- C. Natural gas
- D. Sawdust
- E. Food waste

Choose the **correct** answer from the options given below:

- 1. A, B and C only
- 2. A, C and D only
- 3. A, B and D only
- 4. A, D and E only

Options :

- 51245236549. 1
- 51245236550. 2
- 51245236551. 3
- 51245236552. 4

Question Number : 4 Question Id : 51245212044 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An example for alternate energy source

- 1. Hydrogen gas
- 2. Coal
- 3. Natural gas
- 4. Nuclear energy

Options :

- 51245236553. 1
- 51245236554. 2
- 51245236555. 3
- 51245236556. 4

Question Number : 5 Question Id : 51245212045 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following alternate energies is a better option to reduce the level of atmospheric CO₂ accumulated due to burning of fossil fuels?

1. Solar energy
2. Tidal energy
3. Bioenergy
4. Hydrogen gas

Options :

- 51245236557. 1
- 51245236558. 2
- 51245236559. 3
- 51245236560. 4

Question Number : 6 Question Id : 51245212046 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A biological conversion method involved in the release of energy from biomass

1. Combustion
2. Fermentation
3. Gasification
4. Pyrolysis

Options :

- 51245236561. 1
- 51245236562. 2
- 51245236563. 3
- 51245236564. 4

Question Number : 7 Question Id : 51245212047 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Cogeneration involves the production of _____

1. Methane and electricity
2. Hydrogen and electricity
3. Heat and electricity
4. Electricity alone

Options :

- 51245236565. 1
- 51245236566. 2
- 51245236567. 3
- 51245236568. 4

Question Number : 8 Question Id : 51245212048 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following conditions are more preferred for thermochemical conversion processes?

- A. High moisture content
- B. Low moisture content
- C. High density
- D. Low density
- E. Lignocellulosic biomass
- F. Non-lignocellulosic biomass

Choose the **correct** answer from the options given below:

- 1. B, C and E only
- 2. B, C and F only
- 3. B, D and F only
- 4. A, D and F only

Options :

- 51245236569. 1
- 51245236570. 2
- 51245236571. 3
- 51245236572. 4

Question Number : 9 Question Id : 51245212049 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Match the following bioenergy crops (**List I**) with their suitable examples (**List II**)

List I	List II
Bioenergy crops	Examples
A. First generation bioenergy crop	I. Switchgrass
B. Second generation bioenergy crop	II. Eucalyptus
C. Third generation bioenergy crop	III. Sugarcane

Choose the **correct** answer from the options given below:

1. A - I, B - III, C - II
2. A - III, B - I, C - II
3. A - I, B - II, C - III
4. A - II, B - III, C - I

Options :

51245236573. 1
 51245236574. 2
 51245236575. 3
 51245236576. 4

Question Number : 10 Question Id : 51245212050 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Energy cane, used for the production of ethanol is genetically modified variety of

1. Switchgrass
2. Sugarcane
3. Eucalyptus
4. African palm

Options :

51245236577. 1
 51245236578. 2
 51245236579. 3
 51245236580. 4

Question Number : 11 Question Id : 51245212051 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT a biofuel?

1. Ethanol
2. Methanol
3. Natural gas
4. Butanol

Options :

- 51245236581. 1
- 51245236582. 2
- 51245236583. 3
- 51245236584. 4

Question Number : 12 Question Id : 51245212052 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Process involved in the production of biodiesel from oil crops

1. Transesterification
2. Fermentation
3. Polymerization
4. Pyrolysis

Options :

- 51245236585. 1
- 51245236586. 2
- 51245236587. 3
- 51245236588. 4

Question Number : 13 Question Id : 51245212053 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An alcohol which is also called as wood alcohol

1. Butanol
2. Ethanol
3. Methanol
4. Propanol

Options :

- 51245236589. 1
- 51245236590. 2
- 51245236591. 3
- 51245236592. 4

Question Number : 14 Question Id : 51245212054 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Gas produced from landfill

1. Nitrogen
2. Methane
3. Hydrogen
4. Carbon dioxide

Options :

- 51245236593. 1
- 51245236594. 2
- 51245236595. 3
- 51245236596. 4

Question Number : 15 Question Id : 51245212055 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Organism involved in the production of biogas from organic waste

1. Anarobic bacteria
2. Aerobic bacteria
3. Protozoa
4. Fungi

Options :

- 51245236597. 1
- 51245236598. 2
- 51245236599. 3
- 51245236600. 4

Question Number : 16 Question Id : 51245212056 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Biomass component used for biodiesel production

1. Carbohydrate
2. Lignin
3. Lipid
4. Protein

Options :

- 51245236601. 1

51245236602. 2

51245236603. 3

51245236604. 4

Question Number : 17 Question Id : 51245212057 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A biomass will have high calorific value/heating value if it has a:

1. Low moisture content
2. Low carbon content
3. High ash content
4. All of the above

Options :

51245236605. 1

51245236606. 2

51245236607. 3

51245236608. 4

Question Number : 18 Question Id : 51245212058 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Identify the correct statements related to volatile matter.

- A. Volatile matter belongs to the class of secondary metabolites
- B. It is lipophilic in nature and has high vapour pressure at ambient temperature
- C. It lowers the calorific value/heating value of biomass
- D. It can be converted into bio-oil

Choose the **correct** answer from the options given below:

1. A, B, C, D
2. A, C and D only
3. B, C and D only
4. A, B and D only

Options :

51245236609. 1

51245236610. 2

51245236611. 3

51245236612. 4

Question Number : 19 Question Id : 51245212059 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Major challenge in using lignocellulosic biomass as a feedstock:

1. Limitation in availability
2. Food vs. fuel dilemma
3. Biomass recalcitrance
4. Low calorific value

Options :

- 51245236613. 1
- 51245236614. 2
- 51245236615. 3
- 51245236616. 4

Question Number : 20 Question Id : 51245212060 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Subcritical water is an alternative way to hydrolyze lignocellulosic biomass and to overcome its recalcitrance. This method uses:

1. Water at low temperature and pressure
2. Water at high temperature and pressure without any catalyst
3. Water at high temperature and pressure with zinc as catalyst
4. Water at high temperature and pressure with nickel as catalyst

Options :

- 51245236617. 1
- 51245236618. 2
- 51245236619. 3
- 51245236620. 4

Question Number : 21 Question Id : 51245212061 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

In plant cell most of the lignin get deposited in:

1. Primary cell wall
2. Secondary cell wall
3. Middle lamella
4. Plasma membrane

Options :

- 51245236621. 1
- 51245236622. 2
- 51245236623. 3
- 51245236624. 4

Question Number : 22 Question Id : 51245212062 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Bioproducts such as carbon fibres, dispersants and vanillin are synthesized from:

1. Cellulose
2. Hemicellulose
3. Pectin
4. Lignin

Options :

- 51245236625. 1
- 51245236626. 2
- 51245236627. 3
- 51245236628. 4

Question Number : 23 Question Id : 51245212063 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Lignification of plant cell wall makes the biomass highly resistant to degradation. The reason will be:

1. Lignin is aromatic and highly branched
2. Lignin polymer covalently bind with carbohydrate and this bond is resistant to chemical treatments
3. Functional groups present in lignin affect the reactivity of lignin to various chemical treatment
4. All of the above

Options :

- 51245236629. 1
- 51245236630. 2
- 51245236631. 3
- 51245236632. 4

Question Number : 24 Question Id : 51245212064 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Abundant lignin monomer unit in gymnosperm:

- 1. p-Hydroxyphenyl unit (H)
- 2. Guaiacyl unit (G)
- 3. Syringyl unit (S)
- 4. Both Guaiacyl (G) and Syringyl (S) unit

Options :

- 51245236633. 1
- 51245236634. 2
- 51245236635. 3
- 51245236636. 4

Question Number : 25 Question Id : 51245212065 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Among the different members of plant kingdom lignin content is absent in

- 1. Algae
- 2. Bryophytes
- 3. Pteridophytes
- 4. Algae and bryophytes

Options :

- 51245236637. 1
- 51245236638. 2
- 51245236639. 3
- 51245236640. 4

Question Number : 26 Question Id : 51245212066 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Identify the algae cultivation system that offers the following conditions-

Higher surface area for light illumination, higher productivity and less cross contamination.

1. Photobioreactor
2. Raceway pond
3. Open pond
4. Shallow pond

Options :

- 51245236641. 1
- 51245236642. 2
- 51245236643. 3
- 51245236644. 4

Question Number : 27 Question Id : 51245212067 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

A chemical method for microalgae harvesting:

1. Flocculation
2. Flotation
3. Centrifugation
4. Osmotic shock

Options :

- 51245236645. 1
- 51245236646. 2
- 51245236647. 3
- 51245236648. 4

Question Number : 28 Question Id : 51245212068 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Solvent used to extract oil from microalgae:

1. Water
2. Acetone
3. Glycerol
4. Acetic acid

Options :

51245236649. 1

51245236650. 2

51245236651. 3

51245236652. 4

Question Number : 29 Question Id : 51245212069 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

One step farming method is suitable for the cultivation of seaweed showing:

1. Reproductive lifecycle
2. Alternation of generation
3. Vegetative propagation
4. Long lifecycle

Options :

51245236653. 1

51245236654. 2

51245236655. 3

51245236656. 4

Question Number : 30 Question Id : 51245212070 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Sea based cultivation technique of seaweed:

1. Net style cultivation
2. Pond cultivation
3. Tank cultivation
4. Lake cultivation

Options :

51245236657. 1

51245236658. 2

51245236659. 3

51245236660. 4

Question Number : 31 Question Id : 51245212071 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Microalgae are potential source for biofuel, however the production cost is still high. A possible approach to make algal biodiesel production more economic will be:

1. Mass scale production of algal biomass
2. Enhancing the production of oil in algal cells
3. Selecting microalgae with short lifecycle
4. Promoting birefinery approach

Options :

- 51245236661. 1
- 51245236662. 2
- 51245236663. 3
- 51245236664. 4

Question Number : 32 Question Id : 51245212072 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Agar, alginates and carrageenans are collectively called as:

1. Hydrocolloids
2. Phycobilin
3. Phytoene
4. Phytofluene

Options :

- 51245236665. 1
- 51245236666. 2
- 51245236667. 3
- 51245236668. 4

Question Number : 33 Question Id : 51245212073 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following is a provitamin A carotenoid?

1. Lutein
2. β carotene
3. Phytoene
4. Fucoxanthin

Options :

- 51245236669. 1
- 51245236670. 2

51245236671. 3

51245236672. 4

Question Number : 34 Question Id : 51245212074 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following algal polymers (**List I**) with their application (**List II**):

List I	List II
Algal polymers	Application
A. Fucoidan	I. Preparation of solid culture medium
B. Alginate	II. Alternative to commercial anti-coagulant heparin
C. Agar	III. Sugar free chocolate
D. Mannitol	IV. Helps to reduce cholesterol level

Choose the **correct** answer from the options given below:

1. A - IV, B - I, C - III, D - II

2. A - III, B - II, C - IV, D - I

3. A - II, B - IV, C - I, D - III

4. A - I, B - III, C - II, D - IV

Options :

51245236673. 1

51245236674. 2

51245236675. 3

51245236676. 4

Question Number : 35 Question Id : 51245212075 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Algal polysaccharide that can be used as a safe surgical dusting powder

1. Carrageenan

2. Laminarin

3. Alginate

4. Mannitol

Options :

51245236677. 1

51245236678. 2

51245236679. 3

51245236680. 4

Question Number : 36 Question Id : 51245212076 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following can be used to estimate the solid content of biomass?

1. Hot air oven
2. Muffle furnace
3. Spectrophotometer
4. Bomb calorimeter

Options :

51245236681. 1

51245236682. 2

51245236683. 3

51245236684. 4

Question Number : 37 Question Id : 51245212077 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Beer-lamberts law is the principle behind the working of:

1. Bomb calorimeter
2. Elemental analyzer
3. TOC analyzer
4. Spectrophotometer

Options :

51245236685. 1

51245236686. 2

51245236687. 3

51245236688. 4

Question Number : 38 Question Id : 51245212078 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

When burnt in air, heat is released from biomass. Which of the following tools can be used to measure the amount of heat released?

1. Bomb calorimeter
2. Muffle furnace
3. Spectrophotometer
4. TOC analyzer

Options :

- 51245236689. 1
- 51245236690. 2
- 51245236691. 3
- 51245236692. 4

Question Number : 39 Question Id : 51245212079 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

For the estimation of carbohydrate content 5g of dried powdered sample was taken. After treating with appropriate reagents final volume of the sample solution was made up to 20ml. Absorbance of the sample was 1.76 and the K value was calculated as 0.41 after plotting the standard graph. Estimate the percentage of carbohydrate present in biomass:

- 1. 33.8%
- 2. 57.7%
- 3. 60%
- 4. 73.4%

Options :

- 51245236693. 1
- 51245236694. 2
- 51245236695. 3
- 51245236696. 4

Question Number : 40 Question Id : 51245212080 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Chloroform and methanol are used for the estimation of _____

- 1. Carbohydrate
- 2. Protein
- 3. Lipid
- 4. Cellulose

Options :

- 51245236697. 1
- 51245236698. 2
- 51245236699. 3
- 51245236700. 4

Question Number : 41 Question Id : 51245212081 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Which method is suitable for drying heat sensitive material?

1. Air drying
2. Oven drying
3. Lyophilization
4. All the options

Options :

- 51245236701. 1
- 51245236702. 2
- 51245236703. 3
- 51245236704. 4

Question Number : 42 Question Id : 51245212082 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Ozonolysis is done to:

1. Remove lignin content from biomass
2. Improve the digestability of biomass
3. Degrade the polymers in biomass
4. Improve the density of biomass

Options :

- 51245236705. 1
- 51245236706. 2
- 51245236707. 3
- 51245236708. 4

Question Number : 43 Question Id : 51245212083 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Which of the following methods is used to increase the particle size by gluing powdered biomass?

1. Steam explosion
2. Briquetting
3. Pelletizing
4. Agglomeration

Options :

- 51245236709. 1
- 51245236710. 2
- 51245236711. 3
- 51245236712. 4

Question Number : 44 Question Id : 51245212084 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Karl Fischer titration method is used to measure:

- 1. Ash content
- 2. Fixed carbon content
- 3. Moisture content
- 4. Volatile matter

Options :

- 51245236713. 1
- 51245236714. 2
- 51245236715. 3
- 51245236716. 4

Question Number : 45 Question Id : 51245212085 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following conditions is best suited for the faster ignition of biomass?

- 1. Low moisture content
- 2. High volatile matter content
- 3. High ash content
- 4. Lower carbon content

Options :

- 51245236717. 1
- 51245236718. 2
- 51245236719. 3
- 51245236720. 4

Question Number : 46 Question Id : 51245212086 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Proximate analysis is about measuring:

1. Volatile matter content
2. Element composition
3. Angle of repose
4. Calorific value

Options :

- 51245236721. 1
- 51245236722. 2
- 51245236723. 3
- 51245236724. 4

Question Number : 47 Question Id : 51245212087 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following methods involves the estimation of element by precipitating it to an insoluble complex of known chemical formula by adding specific reagent?

1. Gravimetric analysis
2. Elemental analyzer
3. Colorimetric analysis
4. Atomic absorption spectroscopy

Options :

- 51245236725. 1
- 51245236726. 2
- 51245236727. 3
- 51245236728. 4

Question Number : 48 Question Id : 51245212088 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Angle of repose is to measure _____ of biomass.

1. Density
2. Particle size
3. Conversion efficiency
4. Flow ability

Options :

- 51245236729. 1

51245236730. 2

51245236731. 3

51245236732. 4

Question Number : 49 Question Id : 51245212089 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is also known as vibrational spectroscopy?

1. NMR spectroscopy
2. Atomic emission spectroscopy
3. IR spectroscopy
4. UV spectroscopy

Options :

51245236733. 1

51245236734. 2

51245236735. 3

51245236736. 4

Question Number : 50 Question Id : 51245212090 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Microalgae acts as a bioindicator of pollution and serves as a bioremediation tool by accumulating the pollution causing elements. Which of the following techniques can be used to understand the element accumulation in algal biomass when grown in polluted areas?

1. NMR spectroscopy
2. Atomic emission spectroscopy
3. IR spectroscopy
4. UV spectroscopy

Options :

51245236737. 1

51245236738. 2

51245236739. 3

51245236740. 4

Question Number : 51 Question Id : 51245212091 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is an example for Scanning Probe Microscopy?

1. Fluorescence microscope
2. Atomic Force microscope
3. Confocal microscope
4. Transmission electron microscope

Options :

51245236741. 1

51245236742. 2

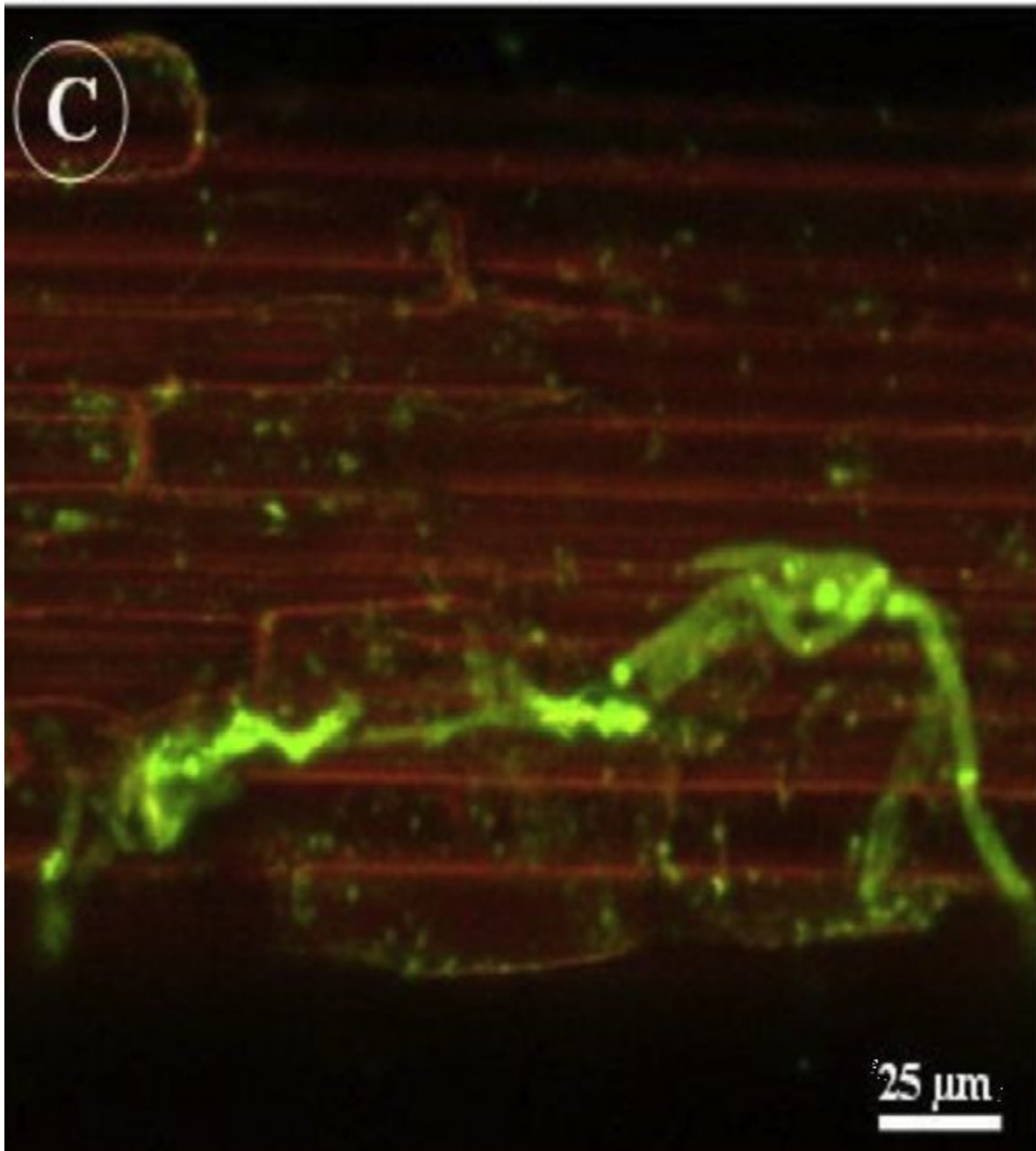
51245236743. 3

51245236744. 4

Question Number : 52 Question Id : 51245212092 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Picture represents the microscopic image from _____



1. Light microscope
2. Scanning electron microscope
3. Transmission electron microscope
4. Fluorescence microscope

Options :

- 51245236745. 1
- 51245236746. 2
- 51245236747. 3
- 51245236748. 4

Question Number : 53 Question Id : 51245212093 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which microscope is more suitable to study surface details of a sample?

1. Phase contrast microscope
2. Scanning electron microscope
3. Light microscope
4. Transmission electron microscope

Options :

51245236749. 1

51245236750. 2

51245236751. 3

51245236752. 4

Question Number : 54 Question Id : 51245212094 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Concept of biorefinery deals with:

1. Production of multiple products from single feedstock
2. Preparation of biomass prior to various conversion process
3. Biofuel production from lignocellulosic biomass
4. Utilization of waste products in bioenergy conversion process

Options :

51245236753. 1

51245236754. 2

51245236755. 3

51245236756. 4

Question Number : 55 Question Id : 51245212095 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The first product to be obtained during sequential extraction process after treating the biomass with chloroform methanol solution:

1. Cellulose
2. Hemicellulose
3. Lipid
4. Starch

Options :

- 51245236757. 1
- 51245236758. 2
- 51245236759. 3
- 51245236760. 4

Question Number : 56 Question Id : 51245212096 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick out the correct statements regarding the goals of biomass pre-treatment.

- A. It must completely degrade the lignin component
- B. It should cause a minimum damage of cellulose and hemicellulose
- C. It should not alter the complex wall polymers
- D. Overcome recalcitrance

Choose the **correct** answer from the options given below:

- 1. A and D only
- 2. B and C only
- 3. A, C and D only
- 4. B and D only

Options :

- 51245236761. 1
- 51245236762. 2
- 51245236763. 3
- 51245236764. 4

Question Number : 57 Question Id : 51245212097 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Extrusion is example for _____ pretreatment.

- 1. Physical method
- 2. Physico chemical
- 3. Biochemical
- 4. Biological method

Options :

- 51245236765. 1
- 51245236766. 2

51245236767. 3

51245236768. 4

Question Number : 58 Question Id : 51245212098 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Laccases enzyme degrades _____.

1. Protein
2. Lignin
3. Hemicellulose
4. Starch

Options :

51245236769. 1

51245236770. 2

51245236771. 3

51245236772. 4

Question Number : 59 Question Id : 51245212099 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Application of thermogravimetric analysis:

1. Analysis of biomass components from its weight change
2. Analysis of gaseous components in the biomass
3. Analysis of deformation and dimensions of biomass
4. Analyzing the total solid content and heating value of biomass

Options :

51245236773. 1

51245236774. 2

51245236775. 3

51245236776. 4

Question Number : 60 Question Id : 51245212100 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In thermogravimetric analysis, biomass composition is analyzed through the weight loss in 3 different steps with different temperatures. The final biomass component retained after the final step is:

1. Lignin
2. Hydrocarbon
3. Proteins
4. Inorganic components

Options :

- 51245236777. 1
- 51245236778. 2
- 51245236779. 3
- 51245236780. 4

Question Number : 61 Question Id : 51245212101 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Hardest polymer to get hydrolysed

1. Protein
2. Lignin
3. Hemicellulose
4. Lipid

Options :

- 51245236781. 1
- 51245236782. 2
- 51245236783. 3
- 51245236784. 4

Question Number : 62 Question Id : 51245212102 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following conditions increases the rate of dilute acid hydrolysis?

1. Presence of catalyst
2. High pressure
3. High temperature
4. Low temperature

Options :

- 51245236785. 1

51245236786. 2

51245236787. 3

51245236788. 4

Question Number : 63 Question Id : 51245212103 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Essential molecule for the breakdown of polymer into its monomer during hydrolysis:

1. H₂
2. O₂
3. H₂O
4. N₂

Options :

51245236789. 1

51245236790. 2

51245236791. 3

51245236792. 4

Question Number : 64 Question Id : 51245212104 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Pick out the conditions that improve the efficiency of biomass combustion.

- A. Large particle size
- B. High volatile matter content
- C. High biomass density
- D. High ash content
- E. High heating value

Choose the **correct** answer from the options given below:

1. B, C and E only
2. A, B and D only
3. A, C and D only
4. C, D and E only

Options :

51245236793. 1

51245236794. 2

51245236795. 3

51245236796. 4

Question Number : 65 Question Id : 51245212105 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The following description is about _____.

Air enters from the bottom of the furnace. Velocity of the air is increased until pressure exerted by the air is equal to the weight of biomass particle. Biomass particles are lifted upward and combustion occurs when the particles are supported in the air stream.

1. Overfeed stocker combustion
2. Underfeed stocker combustion
3. Spreader stocker combustion
4. Fluidized bed combustion

Options :

51245236797. 1

51245236798. 2

51245236799. 3

51245236800. 4

Question Number : 66 Question Id : 51245212106 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following-

A. Combustion	I. Lesser amount of oxygen is supplied II. Larger amount of oxygen is supplied III. Complete oxidation of biomass
B. Gasification	IV. Partial oxidation of biomass V. More CO formed VI. More CO ₂ formed

Choose the **correct** answer from the options given below:

1. A - II, III, VI; B - I, IV, V
2. A - I, III, VI; B - II, IV, V
3. A - I, IV, VI; B - II, III, V
4. A - I, III, V; B - II, IV, VI

Options :

51245236801. 1
51245236802. 2
51245236803. 3
51245236804. 4

Question Number : 67 Question Id : 51245212107 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Major product of gasification:

1. Biogas
2. CO₂
3. Syngas
4. H₂

Options :

51245236805. 1
51245236806. 2
51245236807. 3
51245236808. 4

Question Number : 68 Question Id : 51245212108 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

Gasifier in which gasification occurs when the biomass particles are in suspension:

1. Cross draught gasifier
2. Down draught gasifier
3. Fluidized bed gasifier
4. Updraught gasifier

Options :

- 51245236809. 1
- 51245236810. 2
- 51245236811. 3
- 51245236812. 4

Question Number : 69 Question Id : 51245212109 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

In pyrolysis, high temperature leads to the production of _____.

1. Syngas
2. Bio oil
3. Biochar
4. Ash

Options :

- 51245236813. 1
- 51245236814. 2
- 51245236815. 3
- 51245236816. 4

Question Number : 70 Question Id : 51245212110 Question Type : MCQ Option Shuffling : No Is
Question Mandatory : No
Correct Marks : 1 Wrong Marks : 0

The type of liquefaction in which biomass is first converted to syngas and later to various liquid products:

1. Solvolytic Liquefaction
2. High-Pressure Liquefaction
3. Direct liquefaction
4. Indirect liquefaction

Options :

- 51245236817. 1
- 51245236818. 2
- 51245236819. 3
- 51245236820. 4

Question Number : 71 Question Id : 51245212111 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Gaseous byproduct of fermentation:

- 1. O₂
- 2. CO₂
- 3. CO
- 4. N₂

Options :

- 51245236821. 1
- 51245236822. 2
- 51245236823. 3
- 51245236824. 4

Question Number : 72 Question Id : 51245212112 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Type of fermentation seen in yeast:

- 1. Lactate fermentation
- 2. Acetate fermentation
- 3. Butyrate fermentation
- 4. Ethanol fermentation

Options :

- 51245236825. 1
- 51245236826. 2
- 51245236827. 3
- 51245236828. 4

Question Number : 73 Question Id : 51245212113 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Microorganism involved in yoghurt production:

1. *Lactobacillus*
2. *Clostridium*
3. *Citrobacter*
4. *Enterobacter*

Options :

- 51245236829. 1
- 51245236830. 2
- 51245236831. 3
- 51245236832. 4

Question Number : 74 Question Id : 51245212114 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Pick out the properties of fermented food products.

- A. Improves probiotics
- B. Antioxidant properties
- C. Degradation of anti-nutritive compounds
- D. Antimicrobial properties
- E. Presence of bioactive peptides

Choose the **correct** answer from the options given below:

1. A, C and D only
2. A, B, D and E only
3. A, B, C and D only
4. A, B, C, D, E

Options :

- 51245236833. 1
- 51245236834. 2
- 51245236835. 3
- 51245236836. 4

Question Number : 75 Question Id : 51245212115 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Match the following food item (**List I**) with the fermented product obtained from it (**List II**):

List I	List II
Food item	Fermented product obtained
A. Cereal	I. Sausage
B. Meat	II. Sauerkraut
C. Vegetable	III. Beer

Choose the **correct** answer from the options given below:

1. A - I, B - III, C - II
2. A - II, B - I, C - III
3. A - III, B - I, C - II
4. A - I, B - II, C - III

Options :

51245236837. 1
 51245236838. 2
 51245236839. 3
 51245236840. 4

Question Number : 76 Question Id : 51245212116 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Fuel having highest heating value:

1. Hydrogen
2. Methane
3. Ethanol
4. Gasoline

Options :

51245236841. 1
 51245236842. 2
 51245236843. 3
 51245236844. 4

Question Number : 77 Question Id : 51245212117 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Biological biohydrogen generation that involves the splitting of water to hydrogen using the photosynthetic mechanism of plants:

1. Biological water–gas shift reaction
2. Biophotolysis
3. Photo fermentation
4. Dark fermentation

Options :

- 51245236845. 1
- 51245236846. 2
- 51245236847. 3
- 51245236848. 4

Question Number : 78 Question Id : 51245212118 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Byproduct formed during the combustion of hydrogen:

1. No byproduct
2. Water
3. Oxygen
4. Carbon dioxide

Options :

- 51245236849. 1
- 51245236850. 2
- 51245236851. 3
- 51245236852. 4

Question Number : 79 Question Id : 51245212119 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match **List I** with **List II**:

List I	List II
A. First generation biomethane production	I. Microalgae
B. Second generation biomethane production	II. Lignocellulosic biomass
C. Third generation biomethane production	III. Biowaste

Choose the **correct** answer from the options given below:

1. A - I, B - II, C - III
2. A - II, B - III, C - I
3. A - III, B - I, C - II
4. A - III, B - II, C - I

Options :

- 51245236853. 1
- 51245236854. 2
- 51245236855. 3
- 51245236856. 4

Question Number : 80 Question Id : 51245212120 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Major component of biogas having highest concentration:

1. O₂
2. CO₂
3. H₂
4. Methane

Options :

- 51245236857. 1
- 51245236858. 2
- 51245236859. 3
- 51245236860. 4

Question Number : 81 Question Id : 51245212121 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is used for bioelectricity production?

1. Microbial electrolysis cell
2. Microbial fuel cell
3. Membrane fuel cell
4. Molecular fuel cell

Options :

- 51245236861. 1
- 51245236862. 2
- 51245236863. 3
- 51245236864. 4

Question Number : 82 Question Id : 51245212122 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following can utilize complex biomass polymers for bioelectricity production?

1. Polymer electrolyte fuel cell
2. Microbial fuel cell
3. Direct biomass fuel cell
4. Microbial electrolysis cell

Options :

- 51245236865. 1
- 51245236866. 2
- 51245236867. 3
- 51245236868. 4

Question Number : 83 Question Id : 51245212123 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Byproduct formed at anode of microbial fuel cell during the microbial decomposition of biomass:

1. CO₂
2. O₂
3. H₂O
4. CH₄

Options :

- 51245236869. 1
- 51245236870. 2

51245236871. 3

51245236872. 4

Question Number : 84 Question Id : 51245212124 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Ethanol as a biofuel has numerous disadvantages such as lesser energy content than gasoline, blending limitations with gasoline and potential for corrosion of pipes. What will be the suitable alternative to overcome these disadvantages?

1. Methanol
2. Glycerol
3. Propanol
4. Butanol

Options :

51245236873. 1

51245236874. 2

51245236875. 3

51245236876. 4

Question Number : 85 Question Id : 51245212125 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The end-of-waste concept, whereby 'the substances that are defined as waste can achieve a non-waste status' was introduced by _____.

1. Waste management Inc
2. Waste Framework Directive
3. Environmental Protection Agency
4. International Union for Conservation of Nature

Options :

51245236877. 1

51245236878. 2

51245236879. 3

51245236880. 4

Question Number : 86 Question Id : 51245212126 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Most challenging way of biomass storage:

1. Tarped storage
2. Silo
3. Anaerobic storage
4. Open storage

Options :

- 51245236881. 1
- 51245236882. 2
- 51245236883. 3
- 51245236884. 4

Question Number : 87 Question Id : 51245212127 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following can reduce the chances of biomass autoignition?

1. Storage of biomass in large volume
2. Storage of fine biomass particles
3. Mixing of biomass particles
4. Reducing the storage period

Options :

- 51245236885. 1
- 51245236886. 2
- 51245236887. 3
- 51245236888. 4

Question Number : 88 Question Id : 51245212128 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which zone of biomass pile is more prone to microbial attack?

1. Weather belt
2. Aerobic layer
3. Anaerobic layer
4. All zones are equally prone to microbial attack

Options :

- 51245236889. 1
- 51245236890. 2
- 51245236891. 3

51245236892. 4

Question Number : 89 Question Id : 51245212129 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Need for experimental validation:

1. To understand the basics of a process
2. Determination of functionality of a process
3. Simulation of a well-characterized process
4. Estimation of safety of products

Options :

- 51245236893. 1
- 51245236894. 2
- 51245236895. 3
- 51245236896. 4

Question Number : 90 Question Id : 51245212130 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

In the modeling of a two stage anaerobic digestion, analysis of biochemical and physicochemical reactions of the process are included in

1. Validation outcome
2. Simulation outcome
3. Experimental outcome
4. Traditional experiment validation

Options :

- 51245236897. 1
- 51245236898. 2
- 51245236899. 3
- 51245236900. 4

Question Number : 91 Question Id : 51245212131 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Match the following biomass components (**List I**) with the final product formed from them during pyrolysis (**List II**)

List I	List II
A. Cellulose	I. Ash
B. Lignin	II. Charred residue
C. Extractives	III. Liquid and gas products
D. Inorganic components	IV. Volatile products

Choose the **correct** answer from the options given below:

1. A - I, B - III, C - IV, D - II
2. A - IV, B - II, C - III, D - I
3. A - III, B - I, C - II, D - IV
4. A - II, B - IV, C - I, D - III

Options :

51245236901. 1
 51245236902. 2
 51245236903. 3
 51245236904. 4

Question Number : 92 Question Id : 51245212132 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Which of the following processes favours two different temperatures (mesophilic and thermophilic)?

1. Combustion
2. Ethanol fermentation
3. Lactic acid fermentation
4. Anaerobic digestion

Options :

51245236905. 1
 51245236906. 2
 51245236907. 3
 51245236908. 4

Question Number : 93 Question Id : 51245212133 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 1 Wrong Marks : 0

Need for optimization in bioenergy conversion processes:

1. Maximize the product yield from minimum feedstock used
2. Reduce the production of harmful substances
3. Make the process more sustainable
4. All of the above

Options :

51245236909. 1

51245236910. 2

51245236911. 3

51245236912. 4

Question Number : 94 Question Id : 51245212134 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Alcoholic based biofuel that can be used as a potential alternative for fossil fuel:

1. Butanol
2. Ethanol
3. Methanol
4. Propanol

Options :

51245236913. 1

51245236914. 2

51245236915. 3

51245236916. 4

Question Number : 95 Question Id : 51245212135 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Following are the major approaches for industrial bioethanol production. Which of these can ferment both pentose and hexose sugars in single step?

1. Separate Hydrolysis and Fermentation (SHF)
2. Simultaneous Saccharification and Fermentation (SSF)
3. Simultaneous Saccharification and Co-fermentation (SSCF)
4. Consolidated Bioprocessing (CBP)

Options :

51245236917. 1

51245236918. 2

51245236919. 3

51245236920. 4

Question Number : 96 Question Id : 51245212136 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Renewable energy that promotes the mitigation global climatic change:

1. Bioenergy
2. Solar energy
3. Tidal energy
4. Hydropower

Options :

51245236921. 1

51245236922. 2

51245236923. 3

51245236924. 4

Question Number : 97 Question Id : 51245212137 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Biomass feedstock that can meet the demand of future bioenergy needs by overcoming the problems, namely growing population and shortage of land for biomass production:

1. Sugar crop biomass
2. Oil crop biomass
3. Lignocellulosic biomass
4. Algal biomass

Options :

51245236925. 1

51245236926. 2

51245236927. 3

51245236928. 4

Question Number : 98 Question Id : 51245212138 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An emerging technique that involves the conversion of biowaste to dense carbon. A process similar to that of natural coal formation:

1. Dendro liquid energy
2. Hydrothermal carbonization
3. Thermal cracking
4. Carbon sequestration

Options :

- 51245236929. 1
- 51245236930. 2
- 51245236931. 3
- 51245236932. 4

Question Number : 99 Question Id : 51245212139 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

India's first biorefinery plant is set up in:

1. Andra Pradesh
2. Assam
3. Maharastra
4. Tamil Nadu

Options :

- 51245236933. 1
- 51245236934. 2
- 51245236935. 3
- 51245236936. 4

Question Number : 100 Question Id : 51245212140 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

National Policy on Biofuels to promote the use of biofuel in India was launched in:

1. 1994
2. 2000
3. 2018
4. 1987

Options :

- 51245236937. 1
- 51245236938. 2

3/26/2021

51245236939. 3

51245236940. 4