

National Testing Agency

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Biomass Characterization

Group Number :	1
Group Id :	9409184
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Break time :	0
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Is this Group for Examiner? :	No

Biomass Characterization-1

Section Id :	9409188
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	100
Number of Questions to be attempted :	100
Section Marks :	100
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	9409188
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 940918175 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Major portion of biomass is buildup of

1. Sugar
2. Lipid
3. Protein
4. Ash

Options :

940918561. 1

940918562. 2

940918563. 3

940918564. 4

Question Number : 2 Question Id : 940918176 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following

A. Primary biomass production	i. Corn stover
	ii. Carnivores
B. Secondary biomass production	iii. Decomposers
	iv. Algal biomass

1. A- i, iii ; B- ii, iv
2. A- i, iv ; B- ii, iii
3. A- ii, iv; B- i, iii
4. A- ii, iii; B- i, iv

Options :

940918565. 1
940918566. 2
940918567. 3
940918568. 4

Question Number : 3 Question Id : 940918177 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Identify the correct statement related to alternate energy sources

- A. Hydrogen gas is an example for alternate energy sources
- B. It generates ecological footprints to a lesser extent
- C. Does not involve the combustion of fossil fuel
- D. Replenished very slowly

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

Options :

940918569. 1
940918570. 2
940918571. 3
940918572. 4

Question Number : 4 Question Id : 940918178 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

CO₂ is **NOT** released during the burning of _____

1. Hydrogen gas
2. Biomass
3. Natural gas
4. Coal

Options :

940918573. 1

940918574. 2

940918575. 3

940918576. 4

Question Number : 5 Question Id : 940918179 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Largest source of renewable energy

1. Wind
2. Sun
3. Hydropower
4. Biomass

Options :

940918577. 1

940918578. 2

940918579. 3

940918580. 4

Question Number : 6 Question Id : 940918180 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Syn gas is the product of _____

1. Anaerobic digestion
2. Fermentation
3. Gasification
4. Landfill gas

Options :

940918581. 1

940918582. 2

940918583. 3

940918584. 4

Question Number : 7 Question Id : 940918181 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Biomass with high moisture content is preferred by

1. Anaerobic digestion
2. Gasification
3. Pyrolysis
4. None of these

Options :

940918585. 1

940918586. 2

940918587. 3

940918588. 4

Question Number : 8 Question Id : 940918182 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following solid biomass is more suitable for biological conversion processes?

1. Sawdust
2. Wood chips
3. Cattle manure
4. Briquette

Options :

940918589. 1
940918590. 2
940918591. 3
940918592. 4

Question Number : 9 Question Id : 940918183 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following

A. Bagasse	i. Genetically modified variety of sugarcane used to produce only ethanol
B. Vinnase	ii. Compressed block of solid biomass material
C. Vertex	iii. Fibrous biomass residue of sugarcane left after collecting its juice
D. Briquette	iv. Liquid residue obtained during the distillation process of ethanol production

1. A- ii, B- iii, C- iv, D- i
2. A- iv, B- i, C- ii, D- iii
3. A- i, B- ii, C- iii, D- iv
4. A- iii, B- iv, C- i, D- ii

Options :

940918593. 1
940918594. 2
940918595. 3
940918596. 4

Question Number : 10 Question Id : 940918184 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following solid biomass will be more suited for bioenergy conversion in terms of economic and environmental stability?

1. Tree biomass
2. Shrub biomass
3. Waste biomass
4. Traditional bioenergy crops

Options :

940918597. 1

940918598. 2

940918599. 3

940918600. 4

Question Number : 11 Question Id : 940918185 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

During biodiesel production transesterification process yields _____

1. Fatty acid methyl ester
2. Free fatty acids
3. Methyl ethanoate
4. Methyl ester sulfonate

Options :

940918601. 1

940918602. 2

940918603. 3

940918604. 4

Question Number : 12 Question Id : 940918186 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following alcohol can be produced from syn gas?

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

Options :

940918605. 1

940918606. 2

940918607. 3

940918608. 4

Question Number : 13 Question Id : 940918187 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The process behind the production of biogas

1. Fermentation
2. Anaerobic digestion
3. Hydrolysis
4. Methanogenesis

Options :

940918609. 1

940918610. 2

940918611. 3

940918612. 4

Question Number : 14 Question Id : 940918188 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Process involved in the production of hydrogen from syn gas

1. Dark fermentation
2. Thermochemical process
3. Steam reforming
4. Water-gas shift reaction

Options :

940918613. 1

940918614. 2

940918615. 3

940918616. 4

Question Number : 15 Question Id : 940918189 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Identify the correct statement related to biomethane

1. Methane is a greenhouse gas whereas biomethane is not
2. Biomethane is not a phyxiant that cause suffocation as that of methane
3. Biomethane has a carbon footprint similar to fossil fuel
4. Biomethane can trap more heat when compared to CO₂

Options :

940918617. 1

940918618. 2

940918619. 3

940918620. 4

Question Number : 16 Question Id : 940918190 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A 1000 kg of woody biomass needed for combustion was dried prior to its storage. Upon drying the weight reduced to 650 kg. What will be the moisture content on wet and dry basis.

1. Dry basis – 72.82% Wet basis – 45%
2. Dry basis – 66.67% Wet basis – 40%
3. Dry basis – 62.54% Wet basis – 35%
4. Dry basis – 60.5% Wet basis – 30%

Options :

940918621. 1
940918622. 2
940918623. 3
940918624. 4

Question Number : 17 Question Id : 940918191 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following carbohydrate with their appropriate function in plant body

A. Cellulose	i. Reserve food material
B. Starch	ii. Defensive action
C. Resin	iii. Structural component

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 :

940918625. 1
940918626. 2
940918627. 3
940918628. 4

Question Number : 18 Question Id : 940918192 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following can offer recalcitrance to plant biomass?

- A. Presence of cuticle
- B. Vascular bundle arrangement and density
- C. The degree of lignification
- D. High proportion of sclerenchymatous tissue

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

Options :

940918629. 1

940918630. 2

940918631. 3

940918632. 4

Question Number : 19 Question Id : 940918193 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Crystallinity, degree of polymerization and accessibility of _____ contribute to biomass recalcitrance

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

Options :

940918633. 1

940918634. 2

940918635. 3

940918636. 4

Question Number : 20 Question Id : 940918194 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A pretreatment method used to dissolve components that contribute to biomass recalcitrance?

1. Fermentation
2. Hydrolysis
3. Pyrolysis
4. Liquefaction

Options :

940918637. 1

940918638. 2

940918639. 3

940918640. 4

Question Number : 21 Question Id : 940918195 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Plant cell wall is made up of

1. Cellulose only
2. Cellulose and hemicellulose
3. Cellulose, hemicellulose and pectin
4. Cellulose, hemicellulose and lignin

Options :

940918641. 1

940918642. 2

940918643. 3

940918644. 4

Question Number : 22 Question Id : 940918196 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In plant cell synthesis of lignin monomer occur at

1. Cell wall
2. Middle lamella
3. Plasma membrane
4. Cytoplasm

Options :

940918645. 1

940918646. 2

940918647. 3

940918648. 4

Question Number : 23 Question Id : 940918197 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is most resistant to degradation?

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

Options :

940918649. 1

940918650. 2

940918651. 3

940918652. 4

Question Number : 24 Question Id : 940918198 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following has the highest lignin content

1. Coconut shell
2. Axes of bryophyte
3. *Equisetum* leaf
4. Corn of *Pinus*

Options :

940918653. 1

940918654. 2

940918655. 3

940918656. 4

Question Number : 25 Question Id : 940918199 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Wood of gymnosperm is called as softwood. Why?

1. Lignin content is too less
2. Lignin is absent
3. Produce less dense wood
4. True lignin is not present

Options :

940918657. 1

940918658. 2

940918659. 3

940918660. 4

Question Number : 26 Question Id : 940918200 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following cultivation system offers, cost effective, simple and large volume culturing of microalgae?

1. Tubular bioreactor
2. Flat bioreactor
3. Helical bioreactor
4. Raceway pond

Options :

- 940918661. 1
- 940918662. 2
- 940918663. 3
- 940918664. 4

Question Number : 27 Question Id : 940918201 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Microalgal oil extraction method

1. Centrifugation
2. Ultrasonic method
3. Flocculation
4. Flotation

Options :

- 940918665. 1
- 940918666. 2
- 940918667. 3
- 940918668. 4

Question Number : 28 Question Id : 940918202 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In two step farming of seaweed _____ is used for propagation

1. Gametophytic body
2. Sporophytic body
3. Spore
4. Thallus

Options :

940918669. 1

940918670. 2

940918671. 3

940918672. 4

Question Number : 29 Question Id : 940918203 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A land based seaweed cultivation method

1. Pond cultivation
2. Net style cultivation
3. Long line cultivation
4. Rope farming

Options :

940918673. 1

940918674. 2

940918675. 3

940918676. 4

Question Number : 30 Question Id : 940918204 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Method for the cultivation of *Porphyra* (Nori), one of the most valuable marine crop

1. Pond cultivation
2. Net style cultivation
3. Long line cultivation
4. Rope farming

Options :

940918677. 1

940918678. 2

940918679. 3

940918680. 4

Question Number : 31 Question Id : 940918205 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which among the following is a colorless carotenoid?

1. Phycocyanin
2. β carotene
3. Phytoene
4. Astaxanthin

Options :

940918681. 1

940918682. 2

940918683. 3

940918684. 4

Question Number : 32 Question Id : 940918206 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Microalgal pigments come under the category of

1. Proteins
2. Polysaccharide
3. Lipid
4. Secondary metabolite

Options :

940918685. 1

940918686. 2

940918687. 3

940918688. 4

Question Number : 33 Question Id : 940918207 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Alternative to commercial anticoagulant heparin

1. Agar
2. Fucoidan
3. Mannitol
4. Carrageenan

Options :

940918689. 1

940918690. 2

940918691. 3

940918692. 4

Question Number : 34 Question Id : 940918208 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An important hydrocolloid

1. Mannitol
2. Ulvan
3. Fucoidan
4. Agar

Options :

940918693. 1

940918694. 2

940918695. 3

940918696. 4

Question Number : 35 Question Id : 940918209 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following polymers with the algae from which they are extracted

A. Agar	i. <i>Sargassum</i>
B. Carragenan	ii. <i>Kappaphycus</i>
C. Alginate	iii. <i>Gelidium</i>

1. A- ii, B- iii, C- i
2. A- i, B- ii, C- iii
3. A-iii, B- ii, C- i
4. A- iii, B- i, C- ii

Options :

940918697. 1

940918698. 2

940918699. 3

940918700. 4

Question Number : 36 Question Id : 940918210 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Muffle furnace is used to estimate _____ of biomass

1. Moisture content
2. Total solid content
3. Ash content
4. Total organic carbon content

Options :

940918701. 1

940918702. 2

940918703. 3

940918704. 4

Question Number : 37 Question Id : 940918211 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Estimation of biomolecules such as carbohydrate, protein etc are done through

1. Spectrophotometer
2. Bomb calorimeter
3. Elemental analyzer
4. Gas chromatography

Options :

940918705. 1

940918706. 2

940918707. 3

940918708. 4

Question Number : 38 Question Id : 940918212 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Arrange the following steps involved in the estimation of lignin in the order in which they are performed

- A. Autoclave the sample at 121°C
- B. Add 1 ml of 72% H₂SO₄ to the sample and incubate at 47°C
- C. Dry the sample in oven at 60°C until a constant weight is achieved
- D. Removal of protein and other UV-absorbing materials
- E. Measure the absorbance at 280 nm and 215 nm

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

Options :

- 940918709. 1
- 940918710. 2
- 940918711. 3
- 940918712. 4

Question Number : 39 Question Id : 940918213 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Anthrone method is used for the estimation of

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

Options :

- 940918713. 1
- 940918714. 2
- 940918715. 3
- 940918716. 4

Question Number : 40 Question Id : 940918214 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Folin– ciocalteau (FC) reagent is used for the estimation of

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

Options :

940918717. 1

940918718. 2

940918719. 3

940918720. 4

Question Number : 41 Question Id : 940918215 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

For drying a large quantity of biomass which of the following method is used?

1. Oven drying
2. Air drying
3. Lyophilization
4. Sublimation

Options :

940918721. 1

940918722. 2

940918723. 3

940918724. 4

Question Number : 42 Question Id : 940918216 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is correct about briquetting?

1. Produce compressed block of biomass
2. Chop larger biomass to smaller particles
3. Glue powdered biomass together
4. Improve biomass density at high pressure and steam

Options :

940918725. 1

940918726. 2

940918727. 3

940918728. 4

Question Number : 43 Question Id : 940918217 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Prewighted biomass sample is taken in a closed crucible and kept in muffle for the estimation of _____

1. Moisture content
2. Total organic carbon content
3. Volatile matter content
4. Ash content

Options :

940918729. 1

940918730. 2

940918731. 3

940918732. 4

Question Number : 44 Question Id : 940918218 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Identify the **wrong** statement related to biomass ash content

1. It refers to the total inorganic residue present in biomass
2. Ash content improves the calorific/heating value of biomass
3. High ash content can create trouble during combustion of biomass
4. Herbaceous has high ash content when compared to woody biomass

Options :

940918733. 1

940918734. 2

940918735. 3

940918736. 4

Question Number : 45 Question Id : 940918219 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following condition increases the heating value of biomass

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

Options :

940918737. 1

940918738. 2

940918739. 3

940918740. 4

Question Number : 46 Question Id : 940918220 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Ultimate analysis is about measuring

1. Volatile matter content
2. Element composition
3. Moisture content
4. Ash content

Options :

940918741. 1

940918742. 2

940918743. 3

940918744. 4

Question Number : 47 Question Id : 940918221 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick out the ash forming element from the following

1. Ca
2. N
3. C
4. H

Options :

940918745. 1

940918746. 2

940918747. 3

940918748. 4

Question Number : 48 Question Id : 940918222 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following tools can be used to analyze elemental composition of a given sample?

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

Options :

940918749. 1

940918750. 2

940918751. 3

940918752. 4

Question Number : 49 Question Id : 940918223 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is a good tool to study the composition of the lignocellulosic biomass majorly cellulose, hemicellulose and lignin?

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

Options :

940918753. 1

940918754. 2

940918755. 3

940918756. 4

Question Number : 50 Question Id : 940918224 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Laser Induced Breakdown Spectroscopy (LIBS) is a type of _____

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

Options :

940918757. 1

940918758. 2

940918759. 3

940918760. 4

Question Number : 51 Question Id : 940918225 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pinhole is the characteristic of _____

1. Light microscope
2. Electron microscope
3. Confocal microscope
4. Fluorescence microscope

Options :

940918761. 1

940918762. 2

940918763. 3

940918764. 4

Question Number : 52 Question Id : 940918226 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Microscope showing black and white images

1. Electron microscope
2. Confocal microscope
3. Phase contrast microscope
4. Optical microscope

Options :

940918765. 1

940918766. 2

940918767. 3

940918768. 4

Question Number : 53 Question Id : 940918227 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Preparation of coffee is an example for _____ extraction method

1. Maceration
2. Percolation
3. Decoction
4. Hydro distillation

Options :

940918769. 1

940918770. 2

940918771. 3

940918772. 4

Question Number : 54 Question Id : 940918228 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the separation techniques uses sephadex?

1. Membrane filtration
2. Dialysis
3. Gel filtration chromatography
4. Ion exchange chromatography

Options :

940918773. 1

940918774. 2

940918775. 3

940918776. 4

Question Number : 55 Question Id : 940918229 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Arrange the following biomass components in the order in which they are extracted

- A. Starch
- B. Lipid
- C. Cellulose
- D. Protein

1. A, C, D, B

2. D, B, A, C

3. C, A, B, D

4. B, D, A, C

Options :

940918777. 1

940918778. 2

940918779. 3

940918780. 4

Question Number : 56 Question Id : 940918230 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Steam explosion is an example of

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

Options :

940918781. 1

940918782. 2

940918783. 3

940918784. 4

Question Number : 57 Question Id : 940918231 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The pretreatment method which is more effective, economical, eco-friendly and less health hazardous

1. Physical method
2. Physico chemical
3. Chemical
4. Biological method

Options :

940918785. 1

940918786. 2

940918787. 3

940918788. 4

Question Number : 58 Question Id : 940918232 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Moisture content is a major factor that lowers the heating value of biomass, which can be overcome through pretreatment. During heating some amount of volatile components can also be lost along with moisture. Which technique is most suitable to monitor the lost volatile components ?

1. Pressurized Thermo-Gravimetry analysis
2. Gas chromatography
3. Thermo-Gravimetry analysis
4. Ion exchange chromatography

Options :

940918789. 1

940918790. 2

940918791. 3

940918792. 4

Question Number : 59 Question Id : 940918233 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 temperature. Initial weight loss is due to

1. Release of volatile matter
2. Decomposition of biomass
3. Ash formation
4. Degradation of cellulose

Options :

940918793. 1

940918794. 2

940918795. 3

940918796. 4

Question Number : 60 Question Id : 940918234 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which technique measures the energy absorbed or released by biomass component when it is heated or cooled?

1. IR spectroscopy
2. HPLC
3. Differential Scanning Calorimetry
4. NMR

Options :

940918797. 1

940918798. 2

940918799. 3

940918800. 4

Question Number : 61 Question Id : 940918235 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Saccharification deals about the hydrolysis of _____

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

Options :

940918801. 1

940918802. 2

940918803. 3

940918804. 4

Question Number : 62 Question Id : 940918236 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following polymers with appropriate enzymes for its hydrolysis

A. Lignin	i. Trypsin
B. Pectin	ii. Manganese peroxidase
C. Polysaccharide	iii. Polygalacturonic acid
D. Protein	iv. Dextrinase

1. A - iii, B - iv, C - i, D - ii
2. A - i, B - ii, C - iv, D - iii
3. A - ii, B - i, C - iii, D - iv
4. A - ii, B - iii, C - iv, D - i

Options :

940918805. 1
940918806. 2
940918807. 3
940918808. 4

Question Number : 63 Question Id : 940918237 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Major product of combustion

1. CO₂ + heat
2. Syngas
3. Bio oil
4. All of these

Options :

940918809. 1
940918810. 2
940918811. 3
940918812. 4

Question Number : 64 Question Id : 940918238 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Undesirable product formed during oxygen scarce condition in combustion furnace

1. CO₂
2. CO
3. H₂O
4. Ash

Options :

940918813. 1

940918814. 2

940918815. 3

940918816. 4

Question Number : 65 Question Id : 940918239 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Combustion furnace in which both air and biomass are supplied from the bottom of the furnace

1. Overfeed stocker furnace
2. Underfeed stocker furnace
3. Cyclonic suspension furnace
4. Fluidized bed furnace

Options :

940918817. 1

940918818. 2

940918819. 3

940918820. 4

Question Number : 66 Question Id : 940918240 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Best gasification medium for gasification process

1. Natural air
2. CO₂
3. O₂
4. N₂

Options :

940918821. 1

940918822. 2

940918823. 3

940918824. 4

Question Number : 67 Question Id : 940918241 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Process involved in the production of gasoline and diesel from syngas

1. Fischer – Tropsch method
2. Transesterification
3. Thermal cracking
4. Steam reformation

Options :

940918825. 1

940918826. 2

940918827. 3

940918828. 4

Question Number : 68 Question Id : 940918242 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Thermochemical conversion process carried out in the absence of oxygen

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

Options :

940918829. 1

940918830. 2

940918831. 3

940918832. 4

Question Number : 69 Question Id : 940918243 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Match the following

A. Solvolytic Liquefaction	i. Biodiesel
B. High-Pressure Liquefaction	ii. Biopolymers
C. Indirect liquefaction	iii. Bio-oil

1. A- iii, B- i, C- ii
2. A- i, B- ii, C- iii
3. A- iii, B- ii, C- i
4. A- ii, B- iii, C- i

Options :

940918833. 1

940918834. 2

940918835. 3

940918836. 4

Question Number : 70 Question Id : 940918244 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following pyrolysis method is used to produce polycyclic aromatic hydrocarbons

1. Ablative pyrolysis
2. Flash vacuum pyrolysis
3. Slow pyrolysis
4. Fast pyrolysis

Options :

940918837. 1

940918838. 2

940918839. 3

940918840. 4

Question Number : 71 Question Id : 940918245 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is **NOT** a product of fermentation?

1. O₂
2. CO₂
3. Ethanol
4. Lactic acid

Options :

940918841. 1

940918842. 2

940918843. 3

940918844. 4

Question Number : 72 Question Id : 940918246 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Common step in both aerobic respiration and fermentation

1. Glycolysis
2. Oxidative decarboxylation
3. Kreb cycle
4. Electron transport chain

Options :

940918845. 1

940918846. 2

940918847. 3

940918848. 4

Question Number : 73 Question Id : 940918247 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In batch fermentation, products are collected during _____

1. Lag phase
2. Log phase
3. Stationary phase
4. Death phase

Options :

940918849. 1

940918850. 2

940918851. 3

940918852. 4

Question Number : 74 Question Id : 940918248 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick out the **WRONG** statement about fermented food

1. Make food more digestible
2. Increase the storage life of food
3. Synthesize vitamins
4. Decrease gut microflora

Options :

940918853. 1

940918854. 2

940918855. 3

940918856. 4

Question Number : 75 Question Id : 940918249 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Meat based fermentation product

1. Wine
2. Beer
3. Vinegar
4. Sausage

Options :

940918857. 1

940918858. 2

940918859. 3

940918860. 4

Question Number : 76 Question Id : 940918250 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Microbial electrolysis cells (MECs) is used for the production of

1. Methane
2. Hydrogen
3. Biogas
4. Syngas

Options :

940918861. 1
940918862. 2
940918863. 3
940918864. 4

Question Number : 77 Question Id : 940918251 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Biohydrogen production method which involves the reaction of CO with water to yield CO₂ and H₂ carried out by some photoheterotrophic bacteria under anaerobic condition

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

Options :

940918865. 1
940918866. 2
940918867. 3
940918868. 4

Question Number : 78 Question Id : 940918252 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Arrange the following steps of anaerobic digestion in the order in which it occurs for the production of biomethane

- A. Acetogenesis
- B. Acidogenesis
- C. Hydrolysis
- D. Methanogenesis

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

Options :

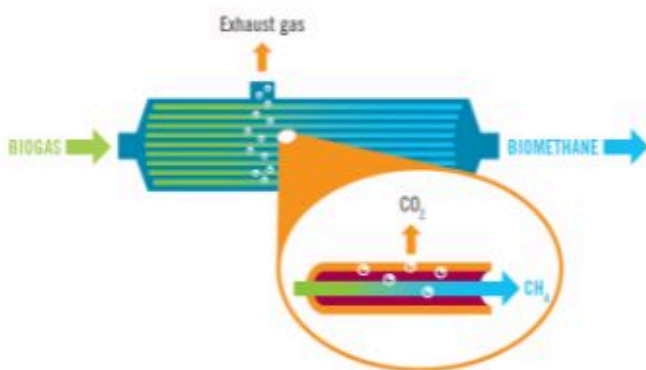
- 940918869. 1
- 940918870. 2
- 940918871. 3
- 940918872. 4

Question Number : 79 Question Id : 940918253 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Purification of methane from biogas is an important step in biomethane production.

Which of the following biomethane purification method is depicted in the picture?



- 1. Scrubbing
- 2. Membrane separation
- 3. Pressure swing adsorption
- 4. Wet oxidation

Options :

940918873. 1

940918874. 2

940918875. 3

940918876. 4

Question Number : 80 Question Id : 940918254 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following condition can increase the biomethane production during anaerobic digestion?

1. High volatile content in biomass
2. Low temperature during hydrolysis and acidogenesis steps
3. pH ranging from 7.4-7.8 during acidogenesis
4. High nitrogen content in biomass

Options :

940918877. 1

940918878. 2

940918879. 3

940918880. 4

Question Number : 81 Question Id : 940918255 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Most preferred substrate for microbial fuel cell with relatively high columbic efficiency for bioelectricity production

1. Pentose sugar
2. Phenolic compound
3. Protein
4. Acetate

Options :

940918881. 1

940918882. 2

940918883. 3

940918884. 4

Question Number : 82 Question Id : 940918256 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Electrode in microbial fuel cell is made up of _____

1. Iron
2. Copper
3. Platinum
4. Carbon

Options :

940918885. 1

940918886. 2

940918887. 3

940918888. 4

Question Number : 83 Question Id : 940918257 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is considered as an ideal renewable alternative to fossil fuels

1. 3-cyclohexyl 3-pentanol
2. 3-hydroxy cyclohexane carboxylic acid
3. 5-hydroxy methyl furfural
4. 2, 4- dihydroxybenzene sulfonic acid

Options :

940918889. 1

940918890. 2

940918891. 3

940918892. 4

Question Number : 84 Question Id : 940918258 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Acetate oxidation involves the production of _____

1. Syn gas
2. Methane
3. Ethanol
4. Hydrogen

Options :

940918893. 1

940918894. 2

940918895. 3

940918896. 4

Question Number : 85 Question Id : 940918259 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Glycerol is collected from which of the following biomass component?

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

Options :

940918897. 1

940918898. 2

940918899. 3

940918900. 4

Question Number : 86 Question Id : 940918260 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0



Type of biomass storage system represented in the figure

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

Options :

- 940918901. 1
- 940918902. 2
- 940918903. 3
- 940918904. 4

Question Number : 87 Question Id : 940918261 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following condition can lead to the degradation of stored biomass?

1. Low moisture content
2. Inflow of oxygen into the biomass
3. Smaller particle size
4. Injection of N₂ gas

Options :

- 940918905. 1
- 940918906. 2
- 940918907. 3
- 940918908. 4

Question Number : 88 Question Id : 940918262 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In experimental validation process, a model built with a certain set of assumptions and descriptions that describes a process is known as

1. Experimental model
2. Mathematical model
3. Computational model
4. Simulation model

Options :

940918909. 1

940918910. 2

940918911. 3

940918912. 4

Question Number : 89 Question Id : 940918263 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Those experiments, which are conducted to understand the basics of a process come under the category of _____

1. Simulation experiment
2. Traditional experiment
3. Validation experiment
4. Data experiment

Options :

940918913. 1

940918914. 2

940918915. 3

940918916. 4

Question Number : 90 Question Id : 940918264 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Importance of experimental validation in bioenergy conversion process

1. To validate the process with outlines and predictions prior to its implementation at large scale
2. To understand the basics of a process
3. Determination of functionality and performance of the process
4. Estimation of safety of the product

Options :

940918917. 1

940918918. 2

940918919. 3

940918920. 4

Question Number : 91 Question Id : 940918265 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Pick out the optimum condition for ethanol fermentation

- A. Ethanol yield increases with sugar yield until a limit beyond which there is no increase
- B. Whey is the common feedstock used for ethanol fermentation
- C. High temperature is recommended for ethanol production

1. A
2. A, B
3. B, C
4. A, B, C

Options :

940918921. 1

940918922. 2

940918923. 3

940918924. 4

Question Number : 92 Question Id : 940918266 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

C/N ratio is an important parameter for the optimization of _____

1. Combustion
2. Gasification
3. Anaerobic digestion
4. Pyrolysis

Options :

940918925. 1

940918926. 2

940918927. 3

940918928. 4

Question Number : 93 Question Id : 940918267 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Common industrial bioethanol purification method

1. Adsorption
2. Ozonation
3. Centrifugation
4. Distillation

Options :

940918929. 1

940918930. 2

940918931. 3

940918932. 4

Question Number : 94 Question Id : 940918268 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Yeast cannot be used for the fermentation of starch containing biomass to produce bioethanol. Why?

1. Yeast does not produce amylase to hydrolyze starch
2. Yeast is not used in bioethanol production
3. Yeast is used for the fermentation of pentose sugar only not for hexose sugar
4. When starch is fermented with yeast it produces toxic compound

Options :

940918933. 1

940918934. 2

940918935. 3

940918936. 4

Question Number : 95 Question Id : 940918269 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following industrial bioethanol production method is carried out in a single reactor with the help of a single microbial community?

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

Options :

940918937. 1

940918938. 2

940918939. 3

940918940. 4

Question Number : 96 Question Id : 940918270 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Biomass component that can act as a catalyst

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

Options :

940918941. 1

940918942. 2

940918943. 3

940918944. 4

Question Number : 97 Question Id : 940918271 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An emerging attractive feedstock for bioenergy production that can be a solution to rapid urbanization, industrialization, population growth and pollution

1. Lignocellulosic biomass
2. Agricultural residues
3. Energy crop
4. Biowaste

Options :

940918945. 1

940918946. 2

940918947. 3

940918948. 4

Question Number : 98 Question Id : 940918272 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

World biofuel day

1. January 5
2. June 11
3. August 10
4. November 21

Options :

940918949. 1

940918950. 2

940918951. 3

940918952. 4

Question Number : 99 Question Id : 940918273 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

India's first Bio-CNG plant for producing CNG (Compressed Natural gas) from agriculture residue was set up in

1. Gujarat
2. Maharastra
3. Karnataka
4. Uttar Pradesh

Options :

940918953. 1

940918954. 2

940918955. 3

940918956. 4

Question Number : 100 Question Id : 940918274 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Major challenge in the globalization of energy production from biomass

1. Emission of CO₂ during biofuel burning
2. Low energy efficiency
3. Technologies are still under developing stage
4. All of these

Options :

940918957. 1

940918958. 2

940918959. 3

940918960. 4