

# National Testing Agency

**Question Paper Name:** Biomass Characterization 09th November 2019 Shift 1  
**Subject Name:** Biomass Characterization  
**Creation Date:** 2019-11-09 15:06:24  
**Duration:** 180  
**Total Marks:** 120  
**Display Marks:** Yes

## Biomass Characterization

**Group Number :** 1  
**Group Id :** 709597173  
**Group Maximum Duration :** 0  
**Group Minimum Duration :** 120  
**Revisit allowed for view? :** No  
**Revisit allowed for edit? :** No  
**Break time:** 0  
**Group Marks:** 120

## Biomass Characterization

**Section Id :** 709597182  
**Section Number :** 1  
**Section type :** Online  
**Mandatory or Optional:** Mandatory  
**Number of Questions:** 120  
**Number of Questions to be attempted:** 120  
**Section Marks:** 120  
**Display Number Panel:** Yes  
**Group All Questions:** No

**Sub-Section Number:** 1  
**Sub-Section Id:** 709597270  
**Question Shuffling Allowed :** Yes

**Question Number : 1 Question Id : 70959716985 Question Type : MSQ Option Shuffling : No Display Question Number : Yes**  
**Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Why biomass burning is called as carbon neutral?

- 1) It does not emit CO<sub>2</sub> while
- 2) CO<sub>2</sub> is emitted during biomass burning but it is absorbed during biomass production
- 3) CO<sub>2</sub> emission by biomass is negligible
- 4) None of these

Question Number : 2 Question Id : 70959716986 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Example for primary biomass feedstock

- 1) Food waste
- 2) Paper waste
- 3) Agriculture residue
- 4) Manure

Question Number : 3 Question Id : 70959716987 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Among the following, primary biomass production is carried out by

- 1) Bacteria
- 2) Fungi
- 3) Plants
- 4) Animals

Question Number : 4 Question Id : 70959716988 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Oldest source of energy

- 1) Sun
- 2) Autotroph
- 3) Heterotroph
- 4) Cyanobacteria

Question Number : 5 Question Id : 70959716989 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A secondary biomass feedstock

- 1) Industrial wood waste
- 2) Saw dust
- 3) Organic waste
- 4) Agricultural residue

Question Number : 6 Question Id : 70959716990 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is **not** an alternative energy source

- 1) Geothermal energy
- 2) Hydropower energy
- 3) Tidal energy
- 4) Nuclear energy

Question Number : 7 Question Id : 70959716991 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is **wrong** about alternative energy

- 1) It is reliable
- 2) Cheaper
- 3) Not sustainable
- 4) Carbon neutral

Question Number : 8 Question Id : 70959716992 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The term bio-energy is related to

- 1) Biomass
- 2) Geothermal energy
- 3) Hydropower
- 4) All the above

Question Number : 9 Question Id : 70959716993 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a greenhouse gas?

- 1) CO<sub>2</sub>
- 2) CH<sub>4</sub>
- 3) H<sub>2</sub>
- 4) N<sub>2</sub>O

Question Number : 10 Question Id : 70959716994 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A method used to produce both heat and electricity

- 1) Combustion
- 2) Cogeneration
- 3) Fermentation
- 4) Pyrolysis

Question Number : 11 Question Id : 70959716995 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Pyrolysis is a

- 1) Biological conversion
- 2) Thermochemical conversion
- 3) Physical conversion
- 4) Biochemical conversion

Question Number : 12 Question Id : 70959716996 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Process involved in the conversion of polysaccharide into simple sugar

- 1) Anaerobic digestion
- 2) Fermentation
- 3) Cogeneration
- 4) Hydrolysis

Question Number : 13 Question Id : 70959716997 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following can improve the biomass conversion process

- 1) High moisture content
- 2) High lignin content
- 3) Low lignin content
- 4) Low calorific value

Question Number : 14 Question Id : 70959716998 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the following

- |                  |                       |
|------------------|-----------------------|
| A. Cellulose     | i. Xylose             |
| B. Hemicellulose | ii. Galacturonic acid |
| C. Pectin        | iii. Glucose          |
| D. Lignin        | iv. Phenylpropanoid   |

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

Question Number : 15 Question Id : 70959716999 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following has a complex structure?

- 1) Cellulosic biomass
- 2) Lignocellulosic biomass
- 3) Algal biomass
- 4) None of these

Question Number : 16 Question Id : 70959717000 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ belongs to third generation bioenergy crop

- 1) Corn
- 2) Sugarcane
- 3) *Jatropha*
- 4) Microalgae

Question Number : 17 Question Id : 70959717001 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Fruit and vegetable wastes are commonly used for

- 1) Combustion
- 2) Anaerobic digestion
- 3) Pyrolysis
- 4) Gasification

Question Number : 18 Question Id : 70959717002 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Lignocellulosic biomass belongs to

- 1) First generation bioenergy crop
- 2) Second generation bioenergy crop
- 3) Third generation bioenergy crop
- 4) Fourth generation bioenergy crop

Question Number : 19 Question Id : 70959717003 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Genetically modified crop that produce only ethanol

- 1) Energy cane
- 2) Vinnase
- 3) African palm
- 4) Rapeseed

Question Number : 20 Question Id : 70959717004 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

FAME is

- 1) P-series fuel
- 2) Butanol
- 3) Biodiesel
- 4) Propanol

Question Number : 21 Question Id : 70959717005 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Primary site of oil synthesis in plants

- 1) Leaf
- 2) Root
- 3) Flower
- 4) Seed

Question Number : 22 Question Id : 70959717006 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Transesterification process produce

- 1) Biodiesel
- 2) Hydrogen
- 3) Ethanol
- 4) Methane

Question Number : 23 Question Id : 70959717007 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Alcohols are produced through

- 1) Hydrolysis
- 2) Fermentation
- 3) Liquefaction
- 4) Gasification

Question Number : 24 Question Id : 70959717008 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Methane is produced under

- 1) Aerobic condition
- 2) Anaerobic condition
- 3) Both aerobic and anaerobic condition
- 4) Fermentation

Question Number : 25 Question Id : 70959717009 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Major component of landfill gas

- 1) Carbon monoxide
- 2) Carbon dioxide
- 3) Methane
- 4) Hydrogen

Question Number : 26 Question Id : 70959717010 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Microbial electrolysis cells are used for the production of

- 1) Methane
- 2) Hydrogen
- 3) Methanol
- 4) Ethanol

Question Number : 27 Question Id : 70959717011 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following method can be used for the hydrogen production?

- 1) Dark fermentation
- 2) Photo-fermentation
- 3) Microbial electrolysis cells
- 4) All the above

Question Number : 28 Question Id : 70959717012 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Ash content of biomass represents

- 1) Inorganic content
- 2) Organic content
- 3) Carbon content
- 4) Lignin content

Question Number : 29 Question Id : 70959717013 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which among the following is a microelement

- 1) C
- 2) H
- 3) Zn
- 4) O

Question Number : 30 Question Id : 70959717014 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Least degradable portion of biomass

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

Question Number : 31 Question Id : 70959717015 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Cellulose is a

- 1) Polysaccharide
- 2) Disaccharide
- 3) Oligosaccharide
- 4) None of these

Question Number : 32 Question Id : 70959717016 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following contribute to biomass recalcitrance

- 1) Cellulose crystallinity
- 2) Cross linkage of hemicellulose with lignin
- 3) High lignin content
- 4) All the above

Question Number : 33 Question Id : 70959717017 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Find out the **wrong** statement related to biomass degradation

- 1) Smaller polymer chains can be easily hydrolyzed
- 2) Crystalline form of cellulose can be easily degraded
- 3) Lignin Carbohydrate complexes contribute to biomass recalcitrance
- 4) Low degree of lignification can promote degradation

Question Number : 34 Question Id : 70959717018 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Major lignin monomer present in gymnosperms

- 1) Coniferyl alcohol
- 2) Coumaryl alcohol
- 3) Sinapyl alcohol
- 4) Syringyl alcohol

Question Number : 35 Question Id : 70959717019 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Lignin is absent in

- 1) Angiosperms
- 2) Pteridophytes
- 3) Bryophytes
- 4) Gymnosperms

Question Number : 36 Question Id : 70959717020 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Correct Marks : 1 Wrong Marks : 0

Prokaryotic algae

- 1) Green algae
- 2) Cyanobacteria
- 3) Red algae
- 4) Brown algae

Question Number : 37 Question Id : 70959717021 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Common method used to extract oil from algae

- 1) Filtration
- 2) Flocculation
- 3) Centrifugation
- 4) Expeller Press

Question Number : 38 Question Id : 70959717022 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is **not** an open cultivation system for algal culturing

- 1) Photobioreactor
- 2) Shallow pond
- 3) Circular pond
- 4) Raceway pond

Question Number : 39 Question Id : 70959717023 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

One- step farming is used for the cultivation of

- 1) Algae growing through vegetative propagation
- 2) Algae with alternation of generation
- 3) Both a and b
- 4) None of these

Question Number : 40 Question Id : 70959717024 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the following

- |                          |                           |
|--------------------------|---------------------------|
| A. Pond cultivation      | i. Land-based cultivation |
| B. Net-Style cultivation | ii. Sea based cultivation |
| C. Long-Line Cultivation |                           |
| D. Tank cultivation      |                           |
- 1) A-i, B-i, C-i, D-ii
  - 2) A-ii, B-ii, C-ii, D-ii
  - 3) A-i, B-ii, C-ii, D-i
  - 4) A-i, B-i, C-i, D-ii

Question Number : 41 Question Id : 70959717025 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is **not** an hydrocolloid obtained from algae

- 1) Agar
- 2) Alginate
- 3) Carrageenan
- 4) Pigment

Question Number : 42 Question Id : 70959717026 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Pigment extracted from microalgae

- 1) Phycobilin
- 2) Beta Carotene
- 3) Lutein
- 4) All the above

Question Number : 43 Question Id : 70959717027 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An alcohol derived from algae having commercial values

- 1) Mannitol
- 2) Agar
- 3) Fucoidan
- 4) Alginate

Question Number : 44 Question Id : 70959717028 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a cell wall polysaccharide obtained from seaweed

- 1) Agar
- 2) Chitin
- 3) Alginate
- 4) Carrageenan

Question Number : 45 Question Id : 70959717029 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is commonly used to prepare solid culture medium in laboratories?

- 1) Alginate
- 2) Mannitol
- 3) Carrageenan
- 4) Agar

Question Number : 46 Question Id : 70959717030 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Fucoidan is only found in the cell wall of

- 1) Green algae
- 2) Brown algae
- 3) Red algae
- 4) Bluegreen algae

Question Number : 47 Question Id : 70959717031 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Muffle furnace is used to determine

- 1) Ash content of biomass
- 2) Moisture content of biomass
- 3) Total solid content of biomass
- 4) Organic molecules present in biomass

Question Number : 48 Question Id : 70959717032 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Estimation of biochemical molecules such as carbohydrate, protein, lignin etc is done using

- 1) Hot air oven
- 2) Bomb calorimeter
- 3) Elemental analyser
- 4) Spectrophotometer

Question Number : 49 Question Id : 70959717033 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Result is obtained in the form of chromatogram for

- 1) TOC analyser
- 2) Elemental analyser
- 3) Bomb calorimeter
- 4) All the above

Question Number : 50 Question Id : 70959717034 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Principle behind spectrophotometer

- 1) Kirchoff's law
- 2) Beer-lambert's law
- 3) Boyle's law
- 4) Charles's law

Question Number : 51 Question Id : 70959717035 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Anthrone method is used for the estimation of

- 1) Lignin
- 2) Protein
- 3) Cellulose
- 4) Lipid

Question Number : 52 Question Id : 70959717036 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Chloroform-methanol solution is used for the estimation of

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

Question Number : 53 Question Id : 70959717037 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Estimation of protein is done by

- 1) Dubois method
- 2) Lowry method
- 3) Anthrone method
- 4) Klason method

Question Number : 54 Question Id : 70959717038 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Phenol and sulphuric acid are the major reagents for the estimation of

- 1) Lignin
- 2) Protein
- 3) Lipid
- 4) Carbohydrate

Question Number : 55 Question Id : 70959717039 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Lyophilization is a method used to

- 1) Dry biomass
- 2) Reduce the biomass particle size
- 3) Densify biomass
- 4) Leaching biomass

Question Number : 56 Question Id : 70959717040 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is **not** a biomass densification process

- 1) Briquetting
- 2) Agglomeration
- 3) Steam explosion
- 4) Ozonolysis

Question Number : 57 Question Id : 70959717041 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Ozonolysis is \_\_\_\_\_ pretreatment method of biomass sample preparation

- 1) Physical
- 2) Chemical
- 3) Biological
- 4) Thermochemical

Question Number : 58 Question Id : 70959717042 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following method is ideal for drying large quantity of biomass

- 1) Air drying
- 2) Oven drying
- 3) Freeze drying
- 4) None of these

Question Number : 59 Question Id : 70959717043 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Role of volatile matter content in biomass conversion

- 1) Inhibits the ignition of biomass
- 2) Promotes the ignition of biomass
- 3) Promotes ash forming
- 4) None of the above

Question Number : 60 Question Id : 70959717044 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Fixed carbon content of biomass is determined by subtracting which of the following

- 1) Moisture content of biomass
- 2) Volatile content of biomass
- 3) Ash content of biomass
- 4) All the above

Question Number : 61 Question Id : 70959717045 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Identify the **wrong** statement

Calorific value of biomass is high if

- 1) Moisture content is low
- 2) Volatile content is high
- 3) Ash content is high
- 4) Fixed carbon content is high

Question Number : 62 Question Id : 70959717046 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Electromagnetic radiation is used in

- 1) Dry ashing
- 2) Wet ashing
- 3) Microwave ashing
- 4) All of these

Question Number : 63 Question Id : 70959717047 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ is based on the colour change of the solution when a reagent reacts with a specific mineral present in the solution

- 1) Colorimetric analysis
- 2) Elemental analyser
- 3) Atomic spectroscopy
- 4) None of these

Question Number : 64 Question Id : 70959717048 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Calorific value of biomass is calculated by

- 1) Gravimetric analysis
- 2) Atomic spectroscopy
- 3) Bomb calorimeter
- 4) Muffle furnace

Question Number : 65 Question Id : 70959717049 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following belongs to ultimate analysis

- 1) Elemental analysis
- 2) Moisture content analysis
- 3) Volatile content analysis
- 4) All the above

Question Number : 66 Question Id : 70959717050 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is **not** biomass ash component?

- 1) Calcium
- 2) Carbon
- 3) Magnesium
- 4) Iron

Question Number : 67 Question Id : 70959717051 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Chemometric analysis is used in \_\_\_\_\_ spectroscopic technique?

- 1) Near-IR
- 2) Mid-IR
- 3) UV-visible
- 4) LIBS

Question Number : 68 Question Id : 70959717052 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following microscope have a good resolution?

- 1) Compound Microscope
- 2) Digital Microscope
- 3) Simple Microscope
- 4) Laser Scanning Confocal Microscope

Question Number : 69 Question Id : 70959717053 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Fluorescence property of the sample is utilized in

- 1) Compound Microscopy
- 2) Digital Microscopy
- 3) Simple Microscopy
- 4) Laser Scanning Confocal Microscopy

Question Number : 70 Question Id : 70959717054 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is **not** an extraction technique?

- 1) Maceration
- 2) Percolation
- 3) Decoction
- 4) None of these

Question Number : 71 Question Id : 70959717055 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Separation and purification of extracted biomass components can be done by

- 1) Percolation
- 2) Gel filtration chromatography
- 3) Decoction
- 4) Maceration

Question Number : 72 Question Id : 70959717056 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A biorefinery product

- 1) Syngas
- 2) Biogas
- 3) Bio-oil
- 4) All the above

Question Number : 73 Question Id : 70959717057 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Correct Marks : 1 Wrong Marks : 0

First step of sequential extraction involves the extraction of

- 1) Lipid
- 2) Cellulose
- 3) Hemicellulose
- 4) Lignin

Question Number : 74 Question Id : 70959717058 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_uses organic and inorganic solvents in combination to break the bonds  
between cellulose and hemicellulose

- 1) Ozonolysis
- 2) Steam explosion
- 3) Organosolvent
- 4) Pyrolysis

Question Number : 75 Question Id : 70959717059 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Hydro thermolysis is also called as

- 1) Steam explosion
- 2) Liquid hot water treatment
- 3) Wet oxidation
- 4) Ionic liquid pretreatment

Question Number : 76 Question Id : 70959717060 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is more effective, economical and less health hazardous

- 1) Physicochemical pretreatment
- 2) Chemical pretreatment
- 3) Biological pretreatment
- 4) None of these

Question Number : 77 Question Id : 70959717061 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Steam explosion is an example for

- 1) Mechanical pretreatment
- 2) Physico-chemical pretreatment
- 3) Chemical pretreatment
- 4) Biological pretreatment

Question Number : 78 Question Id : 70959717062 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Thermogravimetry analysis is used to

- 1) Measure the heat changes
- 2) Analyse gaseous decomposition
- 3) Measure weight changes
- 4) Measure deformations and dimension

Question Number : 79 Question Id : 70959717063 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ measures change of weight of a sample as a function of pressure

- 1) Thermogravimetry analysis
- 2) Differential Scanning Calorimetry
- 3) Thermo-mechanical analysis
- 4) Pressurized Thermo-Gravimetry

Question Number : 80 Question Id : 70959717064 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is more resistant to degradation?

- 1) Pectin
- 2) Lignin
- 3) Chitin
- 4) Protein

Question Number : 81 Question Id : 70959717065 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Identify the **wrong** option regarding saccharification

- 1) It is a type of hydrolysis
- 2) It involves the breakdown of cellulose
- 3) It is carried out prior to fermentation
- 4) None of these

Question Number : 82 Question Id : 70959717066 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Common hydrolysing agent used for acid hydrolysis

- 1) Sulphuric acid
- 2) Formic acid
- 3) Trichloro acetic acid
- 4) Acetic acid

Question Number : 83 Question Id : 70959717067 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Protein hydrolase obtained from plants

- 1) Pepsin
- 2) Trypsin
- 3) Bromelain
- 4) Dipeptidase

Question Number : 84 Question Id : 70959717068 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following improves combustion?

- 1) Low particle size
- 2) High moisture content
- 3) Low heating value
- 4) Low volatile content

Question Number : 85 Question Id : 70959717069 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Initial stage of combustion process

- 1) Pyrolysis
- 2) Drying
- 3) Oxidation
- 4) None of these

Question Number : 86 Question Id : 70959717070 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following has a negative effect on biomass combustion

- 1) High density biomass
- 2) Biomass with high calorific value
- 3) Biomass with high volatile matter
- 4) Biomass with high amount of inorganic compounds

Question Number : 87 Question Id : 70959717071 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Among the different stages of biomass combustion, volatile matters are released

during

- 1) Drying
- 2) Pyrolysis
- 3) Oxidation
- 4) Drying and pyrolysis

Question Number : 88 Question Id : 70959717072 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not used as a gasification medium

- 1) Natural air
- 2) Oxygen
- 3) Steam
- 4) Carbon dioxide

Question Number : 89 Question Id : 70959717073 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Undesirable product during gasification

- 1) CO
- 2) H<sub>2</sub>
- 3) N<sub>2</sub>
- 4) All the above

Question Number : 90 Question Id : 70959717074 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Biomass not suitable for gasification

- 1) Algal biomass
- 2) Agriculture residue
- 3) Forest biomass
- 4) Industrial wood waste

Question Number : 91 Question Id : 70959717075 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a gasification product

- 1) H<sub>2</sub>
- 2) Charcoal
- 3) CO<sub>2</sub>
- 4) CO

Question Number : 92 Question Id : 70959717076 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following condition/conditions favours bio-oil production

- 1) Low temperature
- 2) Long residence time of biomass materials in the pyrolysis chamber
- 3) Small biomass particle size
- 4) All the above

Question Number : 93 Question Id : 70959717077 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ involves the production of syngas from biomass and this syngas is later converted to other products

- 1) Pyrolysis
- 2) Solvolysis liquefaction
- 3) High-pressure liquefaction
- 4) Indirect liquefaction

Question Number : 94 Question Id : 70959717078 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Pyrolysis method having low heating rate

- 1) Fast pyrolysis
- 2) Flash pyrolysis
- 3) Slow pyrolysis
- 4) Microwave pyrolysis

Question Number : 95 Question Id : 70959717079 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Yogurt is obtained through

- 1) Ethanol fermentation
- 2) Acetate fermentation
- 3) Butyrate fermentation
- 4) Lactic acid fermentation

Question Number : 96 Question Id : 70959717080 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Identify the correct option

- 1) Both fermentation and anaerobic respiration are the same process
- 2) Instead of oxygen, alternate terminal electron acceptor is present in both
- 3) Alternate terminal electron acceptor is present only in anaerobic respiration
- 4) 1 and 2

Question Number : 97 Question Id : 70959717081 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not suitable for fermentation

- 1) Lignin
- 2) Starch
- 3) Starch
- 4) Cellulose

Question Number : 98 Question Id : 70959717082 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Fermentation is a continuation process of

- 1) Kreb cycle
- 2) Glycolysis
- 3) Electron transport chain
- 4) Anaerobic respiration

Question Number : 99 Question Id : 70959717083 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is a fermentation product

- 1) Hydrogen
- 2) Hormones
- 3) Enzymes
- 4) All the above

Question Number : 100 Question Id : 70959717084 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In which of the following fresh feedstock is added to the reactor at a regular interval  
without the removal of fermented products

- 1) Batch fermentation
- 2) Fed-batch fermentation
- 3) Continuous fermentation
- 4) All the above

Question Number : 101 Question Id : 70959717085 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Common microorganism used for the fermentation of milk

- 1) *Lactobacillus*
- 2) *Saccharomyces*
- 3) *Bacillus*
- 4) *Pseudomonas*

Question Number : 102 Question Id : 70959717086 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is true about fermented food products

- 1) Can promote the growth of probiotic bacteria
- 2) Can provide antimicrobial properties
- 3) Can improve antioxidant properties
- 4) All the above

Question Number : 103 Question Id : 70959717087 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An electrolysis cell used for the production hydrogen, in which liquid electrolyte is absent

- 1) Photo electrolysis
- 2) Alkaline electrolysis
- 3) Polymer electrolyte membrane electrolysis
- 4) None of these

Question Number : 104 Question Id : 70959717088 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ involves the splitting of water to hydrogen using the photosynthetic mechanism of plants

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

Question Number : 105 Question Id : 70959717089 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Enzyme/enzymes involved in hydrogen production

- 1) Hydrogenase
- 2) Nitrogenase
- 3) Both 1 and 2
- 4) Neither 1 or 2

Question Number : 106 Question Id : 70959717090 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In which of the following methods, solar energy is not used for the production of hydrogen?

- 1) Biophotolysis
- 2) Alkaline electrolysis
- 3) Photo-electrolysis
- 4) Microbial electrolysis cells

Question Number : 107 Question Id : 70959717091 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Arrange the following steps of anaerobic digestion in the order in which they occur

Methanogenesis, Acidogenesis, Hydrolysis, Acetogenesis

- 1) Hydrolysis → Acidogenesis → Acetogenesis → Methanogenesis
- 2) Acidogenesis → Hydrolysis → Acetogenesis → Methanogenesis
- 3) Hydrolysis → Methanogenesis → Acidogenesis → Acetogenesis
- 4) Hydrolysis → Methanogenesis → Acetogenesis → Acidogenesis

Question Number : 108 Question Id : 70959717092 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Identify the **wrong** statement related to biomethane

- 1) Biomethane is produced through anaerobic digestion
- 2) Organic waste is the feedstock for biomethane production
- 3) It is a major component of landfill gas
- 4) Biomethane is not a greenhouse gas

Question Number : 109 Question Id : 70959717093 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Substrate used for electricity production

- 1) Agricultural waste
- 2) Animal waste
- 3) Lignocellulosic biomass
- 4) All the above

Question Number : 110 Question Id : 70959717094 Question Type : MSQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Byproducts formed during the conversion of organic matter into electricity in a microbial fuel cell

- 1) CO<sub>2</sub> and O<sub>2</sub>
- 2) CO<sub>2</sub> and water
- 3) Water and N<sub>2</sub>
- 4) CO<sub>2</sub> and N<sub>2</sub>



Question Number : 111 Question Id : 70959717095 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following can metabolize glycerol to produce ethanol?

- 1) *Escherichia coli*
- 2) *Lactobacillus*
- 3) *Acetobacterium*
- 4) *None of these*

Question Number : 112 Question Id : 70959717096 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Reason for the auto-ignition of stored biomass

- 1) Respiration of microorganisms
- 2) Storage of biomass with small particle size
- 3) Lack of proper air passage inside the biomass pile
- 4) All the above

Question Number : 113 Question Id : 70959717097 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a stored biomass pile, anaerobic microorganism inhabit in

- 1) Innermost region
- 2) Middle region
- 3) Outer region
- 4) Throughout the biomass pile

Question Number : 114 Question Id : 70959717098 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ is used to suppress silo fire

- 1) He
- 2) CO
- 3) N<sub>2</sub>
- 4) O<sub>2</sub>

Question Number : 115 Question Id : 70959717099 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not used for experimental validation

- 1) Computational model
- 2) Mathematical model
- 3) Experimental model
- 4) None of these

Question Number : 116 Question Id : 70959717100 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not related to experimental validation

- 1) It checks the accuracy of a process prior to its implementation at large scale
- 2) It gives basic concepts related to a process
- 3) It helps to simulate a process
- 4) None of these

Question Number : 117 Question Id : 70959717101 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Optimization of biomass combustion can be done by selecting biomass with

- 1) Low carbon content
- 2) Low hydrogen content
- 3) Low nitrogen content
- 4) Low oxygen content

Question Number : 118 Question Id : 70959717102 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

During gasification higher gas yield is obtained when

- 1) Biomass with small particle size is used
- 2) Biomass with large particle size is used
- 3) Low temperature
- 4) None of these

Question Number : 119 Question Id : 70959717103 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Ethanol fermentation is carried out by

- 1) *Lactococcus*
- 2) *Streptococcus*
- 3) *Saccharomyces*
- 4) *Thermotoga*

Question Number : 120 Question Id : 70959717104 Question Type : MSQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Optimization of biomass conversion process depends on

- 1) Biomass composition
- 2) Temperature provided
- 3) Biomass moisture content
- 4) All the above