

- 001.** What are the two primary processes under bio-chemical conversion? **C**
 A Photosynthesis and respiration B Photosynthesis and photovoltaic
 C Anaerobic digestion and fermentation D Anaerobic digestion and photosynthesis
- 002.** What is anaerobic digestion? **B**
 A Produces biogas by heating the biomass B Produces biogas using micro-organisms operating in anaerobic conditions
 C Produces biogas by subjecting the biomass to high pressures D Produces biogas using micro-organisms operating in aerobic conditions
- 003.** Which of the following is not a biomass resource? **D**
 A Animal wastes B Forestry residue
 C Agricultural residue D Sunlight
- 004.** Which of the following can be classified under solid biomass? **A**
 A Agricultural residues B Waste water
 C Industrial effluents into rivers D Plastic
- 005.** Which of the following found in municipal waste can be used as biomass? **B**
 A Agricultural residue B Kitchen waste
 C Residential garbage D Plastic covers
- 006.** Which of the following products of anaerobic digestion consists of organic humus and nutrients? **D**
 A Biogas B Chlorine
 C Top soil D Bio-fertilizer
- 007.** Which of the following is best suited to decompose lignin? **C**
 A Anerobic digestion B Fermentation
 C Thermo-chemical conversion D Bio-chemical conversion techniques techniques
- 008.** Which of the following are considered as contaminant gases in biogas? **C**
 A Chlorine B Fluorine
 C Nitrogen, hydrogen and carbon monoxide D Methane gas and carbon dioxide
- 009.** What are the two main products of anaerobic digestion? **A**
 A Biogas and bio-fertilizer B Waste water
 C Producer gas D Syngas
- 010.** Which of the following organic compounds are present in biogas? **B**
 A Butane gas and carbon dioxide B Methane gas and carbon dioxide
 C Nitrogen D Sodium
- 011.** Which of the following best indicates photosynthesis? **B**
 A Carbon dioxide + water oxygen + glucose B $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ (in the presence of sunlight)
 C Carbon dioxide + water glucose + oxygen (in the presence of sunlight) D Oxygen + glucose carbon dioxide + water
- 012.** Which of the following are photoautotrophs? **A**
 A Cyanobacteria, algae, plants B Archaeobacteria
 C Deer D Tiger
- 013.** Which of the following is produced apart from acetates in acetogenesis step in anaerobic digestion? **C**
 A Carbon monoxide B Charcoal
 C Carbon dioxide D Acetone
- 014.** Which of the following are types of pyrolysis? **A**
 A Flash and ablative B Intermediate and anaerobic digestion
 C Anaerobic digestion and fermentation D Fermentation and intermediate
- 015.** What occurs in the hydrolysis step of anaerobic digestion? **D**

- A Large polymers combine with water molecules B Large polymers break down to form water molecules
- C Small polymers combine to form large polymers with the help of water molecules D Large polymers break down into amino acids, fatty acids and simple sugars
- 016.** What is cellulose made up of? **A**
- A Polysaccharide B Steel
- C Carbon nanofibre D Silicon
- 017.** Hemicellulose is a source of biomass accounting from 20% to 40% by _____ **C**
- A volume B moles
- C weight D molarity
- 018.** Moisture content can be calculated on two bases, namely _____ **C**
- A light and heavy B weighted and even
- C wet and dry D light and dry
- 019.** Conversion of usable sunlight energy into chemical energy is associated with _____ **B**
- A Red pigmentation B Green pigmentation
- C Orange pigmentation D Fruits
- 020.** What is higher heating value? **A**
- A Amount of energy available in the fuel + energy contained in water vapour in the exhaust gases B Total amount of energy available in the fuel - energy contained in water vapour in the exhaust gases
- C Total amount of energy available in the fuel * energy contained in water vapour in the exhaust gases D Total amount of energy available in the fuel
- 021.** In a bio-chemical process, the solid residue represents _____ present in biomass. **C**
- A the quantity of biodegradable carbon B the quantity of biodegradable potassium
- C the quantity of non-biodegradable carbon D the quantity of biodegradable sodium
- 022.** Which of the following is most impacted by the bulk-density of the biomass as-produced? **D**
- A Calorific value B Storage of the fuel after processing
- C Heating value D Transportation and fuel storage costs
- 023.** Which of the following is a problem for using biomass as a source of energy? **D**
- A Less moisture content in the atmosphere during time of harvesting B Low calorific value
- C Low intrinsic silica content D High moisture content in the surroundings
- 024.** Why does burning biomass not add to greenhouse gas emissions? **D**
- A Because it is a clean source B Because it absorbs greenhouse gases to burn
- C Because it releases the same amount of greenhouses gas as burning fossil fuel does D Because it releases greenhouse gas that was captured and converted into other forms during its growth
- 025.** What are the two types of moisture content in biomass? **A**
- A Intrinsic and extrinsic B Higher heating value and lower heating value
- C Lower heating value and extrinsic D Higher heating value and intrinsic
- 026.** What is the increase in temperature per kilometer starting from the crust? **B**
- A 15 degree Celsius B 17 - 30 degree Celsius
- C 100 degree Celsius D 50 - 87 degree Celsius
- 027.** What is the earths core made up of? **C**
- A Gamma rays B Nitrogen
- C Iron D Gold

- 028.** How is the heat inside earth restored? **A**
 A Radioactive decay of elements B Sun restores the heat
 C Hot steam is pumped into earth D Cosmic rays
- 029.** How does geothermal energy work? **C**
 A Uses water from the earth B Uses potential energy
 C Uses heat from the core of earth D Uses heat from atmosphere
- 030.** Which of the following do heat pumps use in geothermal energy? **D**
 A Earths variable temperature B Variable electricity
 C Constant electricity D Earths constant temperature
- 031.** Which of the following is the major drawback of geothermal energy? **D**
 A Low initial cost B Low carbon dioxide production
 C High carbon dioxide production D Extremely location specific
- 032.** Which of the following gases is released by a geothermal site and power plant? **B**
 A Carbon dioxide B Sulphur
 C Iron D Steel
- 033.** Which of the following is the most probably location of geothermal site? **B**
 A Grasslands B Volcanoes
 C Coasts D River beds
- 034.** Who initiated electricity generation from geothermal energy? **B**
 A Indians B Italians
 C Americans D Africans
- 035.** Which of the following is used to locate a geothermal site? **A**
 A Drilling wells B Reflection
 C Seismograph D SONAR
- 036.** Which of the following affect the usage of hydrothermal resources? **A**
 A Temperature and depth of the source B Temperature and location of the site
 C Location of the site and depth of the source D Type of water and steam
- 037.** Which temperature range is most suitable for directly using the hydrothermal resource? **B**
 Note that F stands for Fahrenheit.
 A 100 - 150 degree F B 50 - 60 degree F
 C -100 - -90 degree F D -100 - 0 degree F
- 038.** What is/are the ingredient in hydrothermal plants? **C**
 A Water B Hot water
 C Hot water and steam D Steam and water
- 039.** What are the types of geothermal energy resources? **A**
 A Hydrothermal, geo-pressurised brines, hot dry rocks, magma B Hydrothermal, geo-pressurised brines, hot dry rocks, sun
 C Biomass, geo-pressurised brines, hot dry rocks D Wind, magma, geopressurised brines, hydrothermal
- 040.** What are the forms of geothermal energy? **B**
 A Liquid and solid B Liquid and vapour
 C Solid and Bose-Einstein condensate D Plasma and liquid
- 041.** Dry steam is _____ dominated. **B**
 A liquid B vapour
 C solid D plasma
- 042.** Which of the following is also called as a flash steam plant? **D**
 A Low temperature hydrothermal resource B Dry steam
 C Hydrogen D Hot water
- 043.** Which of the following is a type of high temperature geothermal resource? **A**
 A Dry steam B Dry water
 C Wet steam D Water
- 044.** Which of the following best indicates the electricity generation from dry steam? **A**

- A Drilling well steam pipes generator B Steam drilling well pipes generator
C Steam pipes drilling well generator D Generator steam pipes drilling well
- 045.** What are geopressurised resources? **A**
- A Increased pressure in the geothermal reservoir B Increased temperature in the geothermal reservoir
C Decreased temperature in the geothermal reservoir D Decreased pressure in the geothermal reservoir
- 046.** What is the similarity between enhanced geothermal system and hot dry rock? **D**
- A Magma B Presence of steam
C Presence of fluid D Lack of fluid permeability
- 047.** Deep hydrothermal systems are found at a depth of _____ **B**
- A 1km B 2.5 - 5km
C 10km D 1 - 2km
- 048.** What is the difference between enhanced geothermal system and hot dry rock? **C**
- A Lack of fluid permeability B Fluid permeability
C Presence of fluid D Presence of rocks
- 049.** What is hot dry rock geothermal resource made of? **A**
- A Granite B Soil
C Solid carbon dioxide D Liquid nitrogen
- 050.** Which of the following fracture creation techniques is/are used in hot dry rock geothermal resource? **B**
- A Condensation and hydrofracking B Hydrofracking and hydroshearing
C Hydroshearing and distillation D Hydrofracking and combustion
- 051.** Which of the following gases are released by a geothermal power plant? **B**
- A Carbon B Sulphur
C Sulphate D Argon
- 052.** Why do binary power plants emit less amounts of pollutants? **C**
- A Because they release steam into the atmosphere B Because they release steam into a local water body
C Because they inject water back into the ground without any atmospheric exposition D Because they inject water back into the ground after atmospheric exposition
- 053.** Which of the following is a problem with a geothermal resource? **A**
- A Noise pollution B Low greenhouse gas emission
C Polluting water D Reversing damage to wildlife habitat
- 054.** What are deep hydrothermal systems? **C**
- A Hot dry rock B Magma
C Permeable and fluid saturated region D Impermeable and fluid saturated region
- 055.** Which of the following is responsible for the volcanic geothermal heat? **D**
- A Water B Hot dry rock
C Carbon dioxide D Supercritical water
- 056.** Which of the following are geothermal provinces in India? **D**
- A Telangana B Coimbatore
C Manipur D Godavari
- 057.** What is tidal power? **A**
- A Energy from tides B Energy from water
C Energy from moon D Energy from sun
- 058.** What is the estimated potential for geothermal energy in India? **C**
- A 1000MW B 1MW
C 10000MW D 100MW
- 059.** Which of the following organisations deals with geothermal energy locations in India? **A**
- A Geological Survey of India B Geological Society of India
C Forestry Department D Ministry of external affairs

- 060.** Which of the following is the most promising geothermal locations in India? **B**
 A Sohana B Puga valley
 C Gurgaon D Patna
- 061.** Which of the following best describes the working of a tidal barrage for an incoming tide? **C**
 A Incoming tides generator barrage basin B Incoming tides basin generator barrage
 C Incoming tides barrage basin generator D Generator barrage basin incoming tides
- 062.** Which of the following best describes the working of tidal barrage for outgoing tides? **D**
 A Generator basin ocean outgoing tide B Generator ocean basin outgoing tide
 C Ocean generator basin outgoing tide D Outgoing tide generator basin ocean
- 063.** Tidal barrage is similar to _____ **B**
 A wind plant B dam
 C wind turbines D coal plant
- 064.** What is/are the cause(s) of tides? **C**
 A Gravitational pull of moon B Gravitational pull of moon and sun
 C Gravitational pull of sun and moon and rotation of earth D Gravitational pull of sun
- 065.** In terms of predictability, tidal energy _____ solar and wind. **A**
 A is more predictable than B is less predictable than
 C has similar predictability like D cannot be predicted unlike
- 066.** What is the temperature difference used in ocean thermal energy conversion? Note that F denotes Fahrenheit **B**
 A 10 degree F B A minimum of 77 degree F
 C Between 50 and 60 degree F D A minimum of 100 degree F
- 067.** Why is ocean thermal energy conversion a renewable resource? **B**
 A Because the temperature gradient lasts for a short period of time B Because the upwelling of cold water from the deep ocean is replaced by down welling of surface waters
 C Because ocean water is available in plenty D Because of suns heat
- 068.** What is ocean thermal energy conversion? **A**
 A Harnessing the temperature differences between surface waters and deep ocean waters B Harnessing the temperature differences between the coastal waters and deep ocean waters
 C Harnessing the heat energy from the underwater volcanoes D Harnessing the heat energy between surface water vapour and atmospheric gases
- 069.** What are the three ways to harness tidal energy? **D**
 A Tidal streams, tidal barrages and wind B Tidal barrages, wind and sun
 C Tidal lagoons, river streams and geothermal reservoirs D Tidal lagoons, tidal streams and tidal barrages
- 070.** What is a tidal stream? **B**
 A A river streams B A fast-flowing body of water due to tides
 C A fast-flowing body of water deposited into ocean D A fast-flowing body of water due to winds
- 071.** Open cycle ocean thermal energy conversion systems use _____ as the working fluid. **C**
 A vapour from rivers B water from rivers
 C vapour from seawater D seawater

- 072.** What is the byproduct of an ocean thermal energy conversion system? **D**
 A Electricity B Clean water
 C Water vapour D Cold water
- 073.** _____ turbine is used in closed cycle ocean thermal energy conversion. **B**
 A Horizontal B Low-pressure
 C High-pressure D Vertical
- 074.** Which of the following are types of systems used in ocean thermal energy conversion? **C**
 A Horizontal and vertical B Vertical and open cycle
 C Open cycle and closed cycle D Horizontal and closed cycle
- 075.** Which of the following is used as working fluid in closed cycle oceanic thermal energy conversion systems? **D**
 A Thermohaline circulation B Temperature gradient
 C Greenhouse gases D Refrigerants
- 076.** Which of the following best describes the open-cycle OTEC? **B**
 A Warm surface seawater heat exchanger working fluid turbine
 B Warm surface seawater low-pressure container turbine/generator
 C Deep seawater heat exchanger working fluid turbine
 D Deep seawater low-pressure container turbine/generator
- 077.** Why does an open-cycle OTEC use low-pressure container? **C**
 A To solidify the warm surface seawater B To evaporate the deep seawater
 C To boil and evaporate the warm surface seawater D To solidify the warm surface seawater
- 078.** What is the warm surface seawater pumped through in a closed-cycle ocean thermal energy conversion (OTEC) system? **B**
 A Heat compressor B Heat exchanger
 C Fluid compressor D Turbine
- 079.** Which of the following best describes the working of an ocean thermal energy conversion plant? **B**
 A Oceanic water evaporator turbine/generator electricity
 B Warm surface oceanic water evaporator containing working fluid turbine/generator electricity
 C Cold surface oceanic water electricity evaporator containing working fluid turbine/generator
 D Cold deep oceanic water electricity evaporator containing working fluid turbine/generator
- 080.** What type of working fluids do closed-cycle ocean thermal energy conversion (OTEC) systems use? **A**
 A Low boiling point fluids at atmospheric pressure
 B High boiling point fluids at atmospheric pressure
 C Low boiling point fluids at 100 bar
 D High boiling point fluids at 100 bar
- 081.** Which of the following is a good choice for working fluid? **A**
 A CFCs B Steam
 C Surface seawater D Deep seawater
- 082.** As the vapour pressure of working fluid increases the size of turbine _____ **B**
 A increases B decreases
 C does not change D first increases then decreases
- 083.** Which of the following best describes hybrid ocean thermal energy conversion? **C**
 A Warm surface seawater low-pressure container turbine/generator
 B Deep seawater vacuum chamber flash-evaporated steam vapourises ammonia turbine
 C Warm surface seawater vacuum chamber flash-evaporated steam vapourises ammonia turbine
 D Deep seawater low-pressure container turbine/generator
- 084.** Why does open-cycle OTEC produce desalinized fresh water? **A**
 A Because the vapourised surface B Because of the working fluid

seawater leaves all the salts and contaminants in the low-pressure container

- C Because the warm surface seawater is mixed with deep ocean water D Because of thermohaline circulation

- 085.** Where is the desalinized fresh water used? **B**
 A Sent back into ocean B Used for irrigation and aquaculture
 C Used to generate electricity D Used to generate tides
- 086.** The fuel cell is considered a battery in which _____ is continuously replaced. **C**
 A fuel only B oxidizer
 C both fuel and oxidizer D none of the mentioned
- 087.** The type of reactions in a fuel cell is not determined by _____. **D**
 A fuel and oxidizer combination B composition of electrolyte
 C materials of anode and cathode D catalytic effects of reaction container
- 088.** For which of these devices does negative charge carriers flow from anode to cathode in the external circuit? **D**
 A MHD generator B Thermionic generator
 C Thermoelectric generator D Fuel cell
- 089.** Fuel cell converts chemical energy to electrical energy using a reaction that _____ **A**
 A eliminates combustion of fuel B requires combustion of fuel
 C requires no ignition of fuel D fuel is not required
- 090.** Fuel cell performance is not limited by _____. **B**
 A First law of Thermodynamics B Second law of Thermodynamics
 C Third law of Thermodynamics D All three laws are applicable
- 091.** Which of these fuel cell operates at temperature below 100.C? **C**
 A phosphoric fuel cell B solid polymer electrolyte fuel cell
 C molten carbon fuel cell D hydrogen-oxygen fuel cell
- 092.** Which of these fuel cells operates at high temperatures and pressures? **C**
 A high temperature solid oxide fuel cell B alkaline fuel cell
 C molten carbon fuel cell D phosphoric acid fuel cell
- 093.** Which of these should not be a properties of fuel cell electrodes? **D**
 A good electrical conductors B highly resistant to corrosive environment
 C should perform charge separation D take part in chemical reactions
- 094.** What is the voltage output of hydrogen-oxygen fuel cell?(in V) **A**
 A -1.23 B -1.45
 C -1.01 D -.93
- 095.** Which of these gases or liquids are not used as source of hydrogen in fuel cells? **D**
 A C_2H_6 B C_2H_2
 C C_6H_6 D C_2H_5OH
- 096.** Air pollution in an MHD-steam power plant is caused due to the formation of which of the following compounds? **A**
 A oxides and hydroxides B chlorides and hydroxides
 C oxides and carbonates D carbonates and bicarbonates
- 097.** In closed cycle MHD-steam power plant, which of the following gas is seeded in the MHD duct? **A**
 A helium B xenon
 C sodium vapour D chlorine
- 098.** The air at the entrance of MHD duct is seeded with potassium upto _____. **D**
 A 7% B 5%
 C 3% D 1%
- 099.** Which of these is the most promising power generation system? **A**

A magnetohydrodynamic

C hydrogen

B thermoelectric

D fuel cell

100. Which of these is a non-conventional type of power generation without prime movers? **D**

A hydro power

C nuclear

B thermal

D thermoelectric