

### Unit1 : Solar Thermal Systems

1. The study of various forms of energy and its conversion from one form to another is called\_\_\_\_\_.  
a) Energy technology  
b) Energy science  
c) Energy  
d) Power
2. \_\_\_\_\_is the energy obtained from sources that are essentially inexhaustible.  
a) Conventional Energy  
b) Non-renewable Energy  
c) Renewable Energy  
d) None of these
3. Which of this is (are) a type of Solar Collector(s) ?  
a) Flat plate collector  
b) Cylindrical Parabolic  
c) Paraboloid mirror arrays  
d) All of these
4. \_\_\_\_\_is provided at the bottom of tubing to minimize the heat losses by conduction  
a) Transparent covers  
b) Absorber plate  
c) Thermal insulation  
d) Casing
5. \_\_\_\_\_ are provided at the above of coolant passages for trapping heat received by absorber plate.  
a) Transparent Cover  
b) Absorber plate  
c) Thermal Insulation  
d) Casing
6. In\_\_\_\_\_, the solar radiations are focused on absorber or collector pipe through which the working fluid flows.  
a) Point focusing concentrator  
b) line focusing collectors  
c) Non-focusing collators  
d) none of the above
7. Which of these is not the advantage of solar water heating system ?  
a) Simple to construct and install  
b) No or Negligible running cost  
c) It saves time and high-grade form of electric energy.  
d) Requires sufficient roof space
8. Main component of solar water heating system.  
a) Flat plate collector  
b) Hot water storage tank  
c) Overhead tank  
d) All of these
9. The force circulation system is \_\_\_\_\_ which uses a mechanical pump to circulate hot water.  
a) Passive system  
b) Active system  
c) Open loop system  
d) None of these
10. \_\_\_\_\_ is the example of Non-renewable energy.  
a) Geothermal energy  
b) hydroelectric power  
c) Nuclear energy  
d) None of these
11. The energy sources which are found are stored in nature are called\_\_\_\_\_.  
a) Quaternary energy source  
b) Secondary energy source  
c) Tertiary energy source  
d) Primary energy source
12. In\_\_\_\_\_system the collection, storage and distribution of solar thermal energy is done by natural means.  
a) Active system  
b) Passive system  
c) Both (a) and (b)  
d) None of these
13. The materials used for insulation should have\_\_\_\_\_.  
a) Low thermal conductivity  
b) Stability at high temperatures  
c) Non-corrosive  
d) All of these

14. In order to prevent a non-permitted pressure, increase in solar circuit, the installation for a \_\_\_\_\_ valve is specified.
- a) Safety valve
  - b) Drainage valve
  - c) Flow control valve
  - d) Check valve
15. Range of temperature for flat plate collector is
- a) 100°C to 130°C
  - b) Up to 400°C
  - c) Up to 80°C
  - d) 150°C to 300°C

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## Unit 2 : Solar Photovoltaic Systems

1. In order to get desired voltage, current and power, solar cells are connected in\_\_\_\_\_.  
a) Series  
b) Parallel  
c) Both (a) and (b)  
d) None of these
2. Materials of photovoltaics contains\_\_\_\_\_.  
a) Conductors  
b) Insulators  
c) Semi-Conductors  
d) All of these
3. \_\_\_\_\_have large number of free electrons which are free to move.  
a) Conductors  
b) Insulators  
c) Semi-conductors  
d) None of these
4. These materials do not have any free electrons and hence they never conduct electricity.  
a) Conductors  
b) Insulators  
c) Semi-conductors  
d) None of these
5. \_\_\_\_\_are used for storage of the solar energy.  
a) Photovoltaic Array  
b) Inverter  
c) Energy storage batteries  
d) None of these
6. Capacity of a battery is the total amount of\_\_\_\_\_energy it can store  
a) Electronic  
b) Solar  
c) Electrical  
d) Chemical
7. The voltage output from the PV panels varies depending upon the\_\_\_\_\_of light from sun.  
a) Intensity  
b) Refraction  
c) Reflection  
d) Deflection
8. Which one of these do not have energy storage?  
a) Direct coupled stand-alone system  
b) Stand-alone system with battery storage  
c) Stand alone system with batteries and charge controller  
d) None of these
9. \_\_\_\_\_is a concept which records the difference of unit consumed from utility and the units supplied to the utility by a consumer.  
a) Light bill  
b) Net marketing  
c) Utility meter  
d) None of these
10. \_\_\_\_\_supplies power independently and continuously without any external source to meet DC and AC loads.  
a) Off-grid system  
b) Stand-alone system  
c) Grid connected system  
d) Both (a) and (b)
11. The aim of balance of system (BOS) is to\_\_\_\_\_.  
a) Control and Conduct  
b) Protect components  
c) Distribute power  
d) All of these
12. Polycrystal silicon cells have efficiency between\_\_\_\_\_.  
a) 14% to 19%  
b) 10% to 19%  
c) 11% to 14%  
d) None of these
13. Monocrystal silicon cells have efficiency between\_\_\_\_\_.  
a) 14% to 19%  
b) 10% to 19%  
c) 11% to 14%  
d) None of these

14. The basic components of Photovoltaic Array are\_\_\_\_\_.
- a) Module
  - b) Solar cell
  - c) Panel
  - d) Array
15. Which one of the following is not the application of solar PV system?
- a) Power supplies
  - b) Power source to satellites
  - c) Water treatment
  - d) All of these

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### Unit 3 : Wind Energy Systems

1. \_\_\_\_\_ are caused due to greater solar heating of the earth's surface near the equator as compared to solar heating near northern or southern poles.  
a) planetary winds  
b) local winds  
c) Solar winds  
d) None of these
2. Wind energy is an \_\_\_\_\_ form of solar energy.  
a) Direct  
b) Straight  
c) Indirect  
d) Random
3. Darrieus type rotors consist of two or three convex blades with \_\_\_\_\_ cross-section.  
a) rectangular  
b) Aerofoil  
c) Cylindrical  
d) Circular
4. Wind at surfaces is more turbulent which increases the stresses in \_\_\_\_\_.  
a) VAWT  
b) HAWT  
c) Both (a) and (b)  
d) None of these
5. The full-form of WECS is \_\_\_\_\_.  
a) Wind Energy conversion Solitary  
b) Wind Energy Consulting Services  
c) Wind Energy Conversion Systems  
d) Wind Electrical Conversion Services
6. \_\_\_\_\_ has low cut in speed of about 8 kmph.  
a) VAWT  
b) HAWT  
c) Both (a) and (b)  
d) None of these
7. HAWT has blade, cut in speed of about \_\_\_\_\_.  
a) 10 kmph  
b) 8 kmph  
c) 12 kmph  
d) 16 kmph
8. The pitch of the blade is controlled automatically so as to provide the \_\_\_\_\_ action.  
a) Cooling  
b) Feathering  
c) blowing  
d) Wearing
9. The mechanical energy developed by the turbine rotor is converted into electrical energy by \_\_\_\_\_.  
a) Generator  
b) inverter  
c) Gyrope  
d) Gear box
10. Wind energy generators which need the energy storage facility are called \_\_\_\_\_.  
a) Stand-alone System  
b) Grid connected system  
c) Hybrid system  
d) All of the above
11. The function of \_\_\_\_\_ is to derive the reference voltage and frequency signals from grid and to sense the wind speed and its direction.  
a) Generator  
b) Yaw Control  
c) Controller  
d) Wind turbine
12. \_\_\_\_\_ failure of wind mill may cause its parts to fly and harm the people around them  
a) Electrical  
b) Mechanical  
c) Electromagnetic  
d) None of these
13. \_\_\_\_\_ are caused due to heating of land and water in coastal areas.  
a) Local Winds  
b) Solar winds  
c) Planetary winds  
d) None of these
14. \_\_\_\_\_ is the wind speed below which the machine doesnot rotate and no power is produced.  
a) Cut-out speed  
b) Cut-in speed  
c) Aero speed  
d) All of these

15. \_\_\_\_\_ systems are useful since it can provide power throughout the year.
- a) Wind energy power system
  - b) Offshore wind energy
  - c) Solar wind hybrid Power
  - d) None of these

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## MCQs on Renewable Energy Technologies (RET - 22661)

### Chapter no.4 Micro Hydro Power Systems

1. Which of the following is not a requirement for site selection of hydroelectric powerplant?
  - a) Availability of water
  - b) Large catchment area
  - c) Rocky land
  - d) **Sedimentation**
  
2. The amount of electrical energy that can be generated by a hydroelectric power plant depends upon \_\_\_\_\_
  - a) Head of water
  - b) **Quantity of water**
  - c) Specific weight of water
  - d) Efficiency of Alternator
  
3. Potential energy of water is used to drive the turbine.
  - a) True
  - b) **False**
  
4. Hydroelectric power plant is \_\_\_\_\_
  - a) Non-renewable source of energy
  - b) **Conventional source of energy**
  - c) Non-conventional source of energy
  - d) Continuous source of energy
  
5. Hydroelectric power plant is generally located near load centre.
  - a) True
  - b) **False**
  
6. Hydroelectric power plant is mainly located in \_\_\_\_\_
  - a) Flat areas
  - b) Deserts
  - c) **Hilly areas**
  - d) Deltas
  
7. Which of the following is not an advantage of hydroelectric power plant?
  - a) no fuel requirement
  - b) low running cost
  - c) **continuous power source**

d) no standby losses

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8. Which of the following statement is true about hydroelectric power plant?
- a) **Hydroelectric power plants are multipurpose.**
  - b) Due to non-uniform flow of water frequency control in such plants is very difficult.
  - c) Hydroelectric power plant has high running cost
  - d) Water is used as fuel in hydroelectric power plant
9. Which element of hydroelectric power plant prevents the penstock from water hammer phenomenon?
- a) Valves and Gates
  - b) Draft tubes
  - c) Spillway
  - d) **Surge Tank**
10. Dam having very wide base as compared to its height is called \_\_\_\_\_
- a) buttress dam
  - b) arch dam
  - c) **earth dam**
  - d) solid gravity dam
11. Spillway discharges the overflow water to the downstream side when the reservoir is full.
- a) **True**
  - b) False
12. Trash racks are built for \_\_\_\_\_
- a) discharging the water freely from the turbine exit to tailrace
  - b) **preventing the turbine from ingress of floating and other materials**
  - c) creating artificial head to store sufficient potential energy of water
  - d) controlling the opening of valves
13. Penstock in a hydroelectric power plant is \_\_\_\_\_
- a) a pipe connected to runner outlet
  - b) nozzle that release high pressure water on turbine blades
  - c) **a conduit connecting forebay to scroll case of turbine**
  - d) a pipe connecting surge tank to dam
14. The pressure at the inlet or exit of the draft tube should not be \_\_\_\_\_
- a) **less than one third of atmospheric pressure**
  - b) greater than one third of atmospheric pressure
  - c) less than one atmospheric pressure
  - d) greater than one atmospheric pressure

15. Draft tube increases the operating head on the turbine.  
a) True  
b) False
16. Which statement about surge tank is wrong?  
a) Ideal location of surge tank is at the turbine inlet  
b) A decrease in load demands cause a rise in water level in surge tank  
c) Surge tanks are totally closed to avoid entry of unwanted objects to penstock  
d) Surge tanks are installed to reduce harm effects of water hammer phenomenon
17. Trash racks are located \_\_\_\_\_  
a) near tailrace  
b) at the entrance of turbine  
c) inside penstock  
d) intake
18. What is the function of booms?  
a) It supports the dam  
b) It supports the penstock  
c) It divert the Icebergs from flowing into the penstock  
d) To hold the turbine structure

### Chapter no. 5 Bio Energy system

1. Which of the following are the benefits/uses of biogas?

- 1) Bio-manure is obtained
- 2) Improves sanitation in village
- 3) Reduce causes of climate change

- a. 1
- b. 2, 3
- c. 1, 3
- d. All of the above

2. The term biomass most often refers to \_\_\_\_\_

- a) Inorganic matter
- b) Organic matter
- c) Chemicals

d) Ammonium compounds

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- 3. Dead organisms are also comes under the biomass.**  
a) True  
b) False
- 4. Biomass is useful to produce \_\_\_\_\_**  
a) Chemicals  
b) Fibres  
c) Biochemicals  
d) Transportation fuels
- 5. Which one of the following is an example of starch crops biomass feed stocks?**  
a) Sugar cane  
b) Wheat straw  
c) Corn stover  
d) Orchard prunings
- 6. Which of the following forestry materials can be used as biomass?**  
a) Logging residues  
b) Tallow  
c) Fish oil  
d) Manure
- 7. Which of the following is not used as biomass?**  
a) Hybrid poplar  
b) Willow algae  
c) Iron nails  
d) Trap grease
- 8. The aerobic digestion of sewage is used to produce \_\_\_\_\_**  
a) Biomass  
b) Bio fuels  
c) Synthetic fuels  
d) Metal articles
- 9. Bio ethanol is denatured alcohol that is also called as \_\_\_\_\_**  
a) Ethylene  
b) Methylated spirit  
c) Ethylene glycol  
d) Methylene
- 10. The production of bio ethanol is by fermenting the \_\_\_\_\_ and starch components.**  
a) Acid  
b) Milk  
c) Sugar  
d) Alcohol

- 11.** The bio ethanol is subjected to rectification to remove \_\_\_\_\_
- Sugar
  - Enzymes
  - Yeast
  - Impurities**
- 12.** The bio ethanol obtained in the fermentation process has \_\_\_\_\_purity.
- 99%
  - 99.2%
  - 99.4%
  - 99.7%**
- 13.** The by-products that are produced during rectification of bio ethanol is used as \_\_\_\_\_
- Pig feed
  - Cow feed
  - Dog feed**
  - Sheep feed
- 14.** To make transport fuel the bio ethanol is blended with \_\_\_\_\_
- Diesel
  - Petrol**
  - Oil
  - Kerosene
- 15.** \_\_\_\_\_ is called as the bio gas.
- Bio ethanol
  - Bio methane**
  - Bio diesel
  - Bio butanol
- 16.** The percentage of carbondioxide in the bio methane is \_\_\_\_\_
- 30-40
  - 32-43**
  - 35-45
  - 55-60
- 17.** All biofuels are made from:
- Corn
  - animal fat
  - biological ingredients**
  - None of the above
- 18.** Which of the following is not a potential biofuel?
- Grassoline
  - hydrogen fuel cells**
  - algae biodiesel

4. None of the above

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**19. Ethanol refers to any biofuel made from:**

- a) Grass
- b) corn
- c) **plant carbohydrates**
- d) None of the above

**20. What's the primary source of biodiesel?**

- a) Soybeans
- b) **plant oil**
- c) animal fat
- d) None of the above

### Chapter no.6

## Renewable Energy hybrid systems and Feasibility Studies

**21. Renewable Hybrid system consist of how many no. of Natural systems/resources.**

- a) Zero
- b) One
- c) **Two or more**
- d) None of the above

**22. Absorption of Solar radiations at earth's surface occur due to presence of**

- (A) Ozone
- (B) Water vapours
- (C) Carbon di-oxide
- (D) **All of the above**

**23. Photovoltaic solar energy conversion system makes use of**

- (A) fuel cell
- (B) solar cell**
- (C) solar pond
- (D) none of the above.

**24. Solar cells are made of**

- (A) **silicon**
- (B) germanium
- (C) silver
- (D) aluminium.

**25. The voltage of a single solar cell is**

- (A) 0.5 V**
- (B) 1 V
- (C) 1.1 V
- (D) 5 W.

**26. The major disadvantage, with solar cells for power generation is**

- (A) lack of availability
- (B) large area requirement
- (C) variable power
- (D) high cost.**

**27. The maximum theoretical efficiencies of solar sales could be around**

- (A) 99%
- (B) 60%
- (C) 48%**
- (D) 1%.

**28. The source of energy for satellite is**



(A) battery

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(B) solar cell

(C) cryogenic storage

(D) any of the above.

**29. Thermal storage of energy is possible in the form of**

(A) sensible heat

(B) latent heat

(C) chemical reaction

(D) any of the above.

**30. The installed capacity of wind energy in India is about**

a. 8000 MW

b. 1500 MW

c. 6000 MW

d. 4000 MW

**31. The solar or photo voltaic cell converts:**

a) Chemical energy to electrical energy

b) Solar radiation into electrical energy

c) Solar radiation into thermal energy

d) Thermal energy into electrical energy

**32. Sun tracking system is required in the case of:**

a) Cylindrical and parabolic and paraboloid

b) Flat plate collector

c) Both (a) and (b)

d) None of the above

**33. Which of the following area is preferred for solar power plants:**

- a) Coastal areas
- b) Hot arid zones**
- c) Mountain tops
- d) High rainfall zones

**34. A pyranometer is used for measurement of.....**

- a) Direct radiation only
- b) Diffuse radiation only
- c) Direct as well as diffuse radiation**
- d) All of the above

**35. Reflecting mirrors used for exploiting solar energy are called.....**

- A.Mantle
- B.Ponds
- C.Diffusers
- D.Heliostats**