\* Solar power Generation: Solar energy refers to energy produced and radiated by sun. Solar energy can be converted directly or indirectly into other form of energy, such as heat and In one hour, amount of solar energy electricity. from sun falls on earth is more than entire worlds consumption in one year. Here energy from sun radiation are converted into the electrical energy using semi-conductor making like silicon, germanium etc. solar energy can be utilized by using direct and indirect method. Direct method are classified into thermal energy conversion and photovoltaic energy. Indirect method are tidal, wind, biomass, waves & ocean thermal energy. Utilization: (1) More energy from sun falls on earth in one hour than is used by everyone in world in one year. A variety of technologies convert sunlight to usable energy for buildings. (2) most commonly used solar technologies for homes & bussinesses are solor photovoltails for electricity, passive solar design for space heating & solar water heating. (3) Bussiness & industry uses solar technology to diversify their energy source, improve

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efficiency & sove more money.

(4) Energy developers & whities use solor photovoltaic & concentrating solar power technologies to produce electricity on massive scale to power cities & small town.

Diagram: Refer ppt.

components:

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(1) PY Cell or Solar Cell:

(1) They are made from semi conductor, thin times, poly crystalline silicon, mono-crystallin silicon & amorphous cells. Solar cell is a semi conductor device which converts the radiation energy into electrical energy by photovoltaic effect.

(2) Ef photon of light has energy greater than band gap then electron is emitted & this flow of current breates current pv system uses one or more solar modules to convert solar energy into electrical energy.

(3) PV cells are used for construction of PV power System. Amount of power siven by PV cells is very less, up to few watts, due to surface area limit. For increasing amount of power generated, PV cells are grouped to form PV module.

(4) It is also possible to connect a group of PV modules either in series, parellel or both to form PV array, whose power range

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from kw to mw.

(2) PY Module:

(1) Voltage generated by single solar cell is very low, around 0.5%. so large number of cells are connected in both series and parellel connection to set desired output. en case of partial shading, diodes may be needed to avoid reverse current flow in array.

(2) Good ventilation behind solar panel is given to avoid possibility of less efficiency even at high temp.

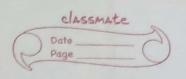
(3) PV Aways (Solar Collectors): (1) Power requirments cannot be provided by single module. PY array produce DC output voltage, this output canbe converted to AC by using inverters & it can be used for running motors, lighting & other loads. (2) By connecting module in series we get more voltage rating e by connecting in parellel, we get higher current rating. (3) PY arrays are also called solor collector. Solar collectors are of two types;

1> Flat plate collector

-) Cocentrating collector.

Advantages Disadvantages Application

P Refer ppt.

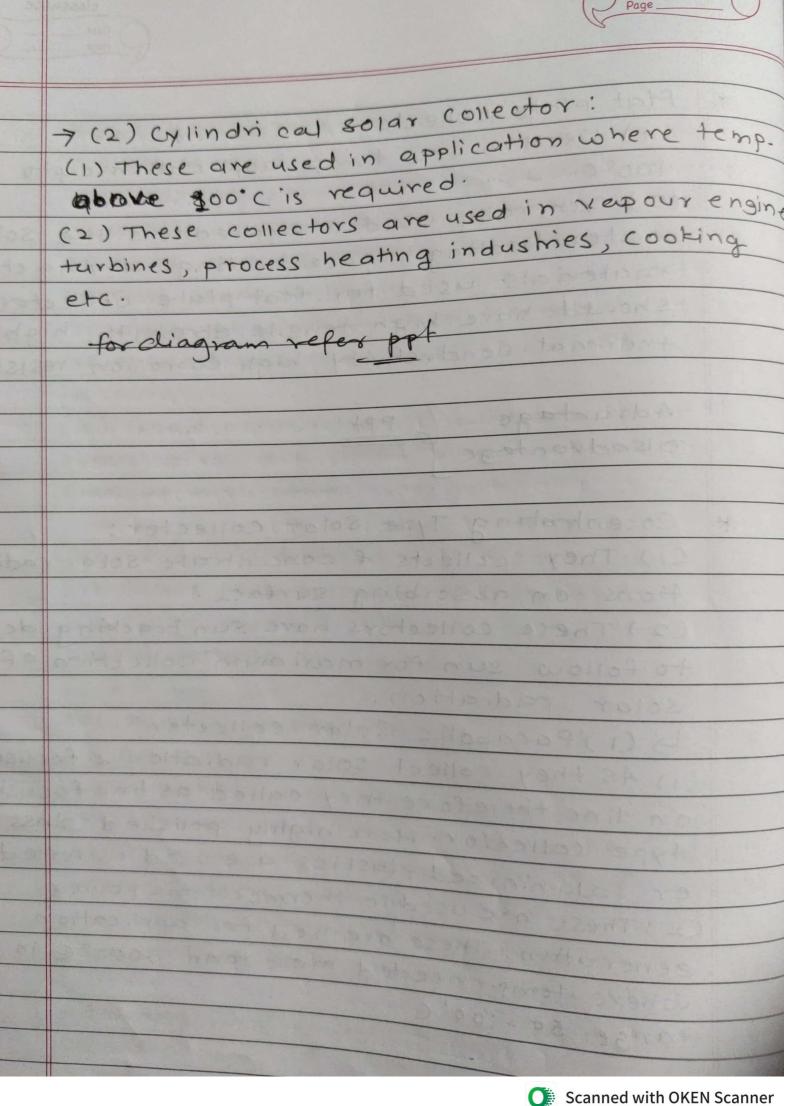


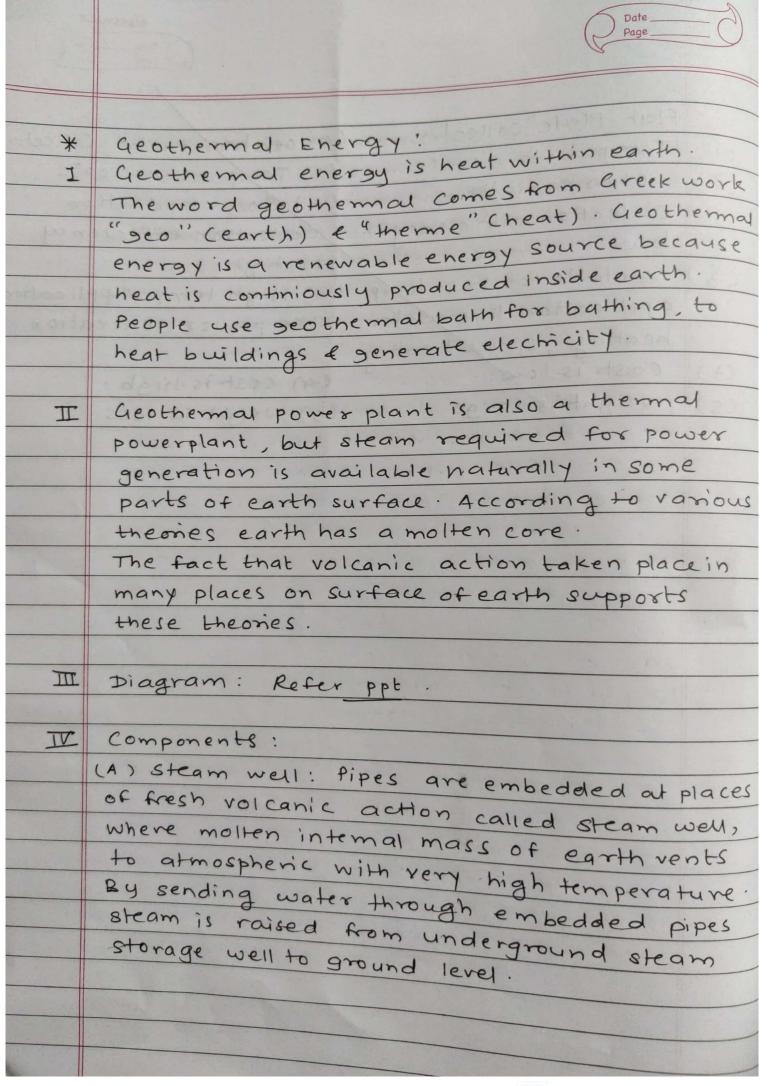
Plat plate collector:

- (1) Used in low temp. application cupto 100°C.
- (2) Generally used in applications like solar water heating space heating, drying etc. materials used for flat plate collector should have high tensile strength, high thermal conductivity, high corrosion resistance

Advantage PPF Disadrantage

- \* Cocentrating Type Solar Collector:
  - (1) They collects & concentrate solar radiations on absorbing syrface.
  - (2) These collectors have sun tracking device to follow sun for maximum collection of solor radiation.
  - 4 (1) Parabolic Solar collector:
  - (1) As they collect solar radiation & focuses on line therefore they called as line focusing type collector. Here highly polished glass aluminized plastics are used as reflectors (1) These are used in thermoelectric power generation. These are used for application where temp needed make than soones & in range 50-100°C





- (B) Separator: steam is then pass through separator where most of dirt & sand carried by steam are removed.
- (c) Turbine: The steam from seperator is passed through steam drum & is used to run turbine which in turn drives generator. The exhaust steam from turbine is condensed. The condensate is pumped into earth to absort ground heat again & to get converted into

Location of plants, installation of equipments like control unitetc, within source of heat and cost of drilling deep wells as 15,000 m are some of difficulties commonly encountered.

I Three main types of geothermal systems: (AN) Drivered cuse of district breating systems:

- (1) Dry steam plants
- (2) Flash steam Plants
- (3) Binary cycle power plants.

(1) Dry steam plant: Use steam directly from reservoir to turn generates turbines. The first geothermal power plant was build in 1904 in Tuscany, Italy where natural steam erupted from earth.

