Geothermal

greek word

Geo (earth) - Therme (heat)

Heat of earth

Interior is very hot → So make use of this geothermal energy

Volcanoes - ज्वालामुखी

Temp of Core - 4000°c

Active Volcanoes erupt lava - 1200°c

Temp of Hot Springs 300

Heat ~~Cold~~ to ~~Hot~~ Colder

Temp increase with depth 30°c per km

drill 10 km deep & Production wells to obtain geothermal fluids

Geothermal energy ~~out~~ ~~in the~~ of earth is in the following forms

(1) Hot water springs

(2) The Geysers — Hot water & Steam

(3) ~~Fuma~~ Fumaroles - Hot Steam

(4) ~~Volcanic~~ Volcanoes Hot Steam and Hot gases

Advantages :-

(i) It is reliable source of energy which is available continuously throughout the year

(ii) it is independent of weather conditions

(iii) Capital and generation cost is low as compared to conventional thermal power plants

(iv) No Solid Pollutants

(v) Need very small land area.

(vi) Power generation is more than wind and Solar energies

Disadvantages:-

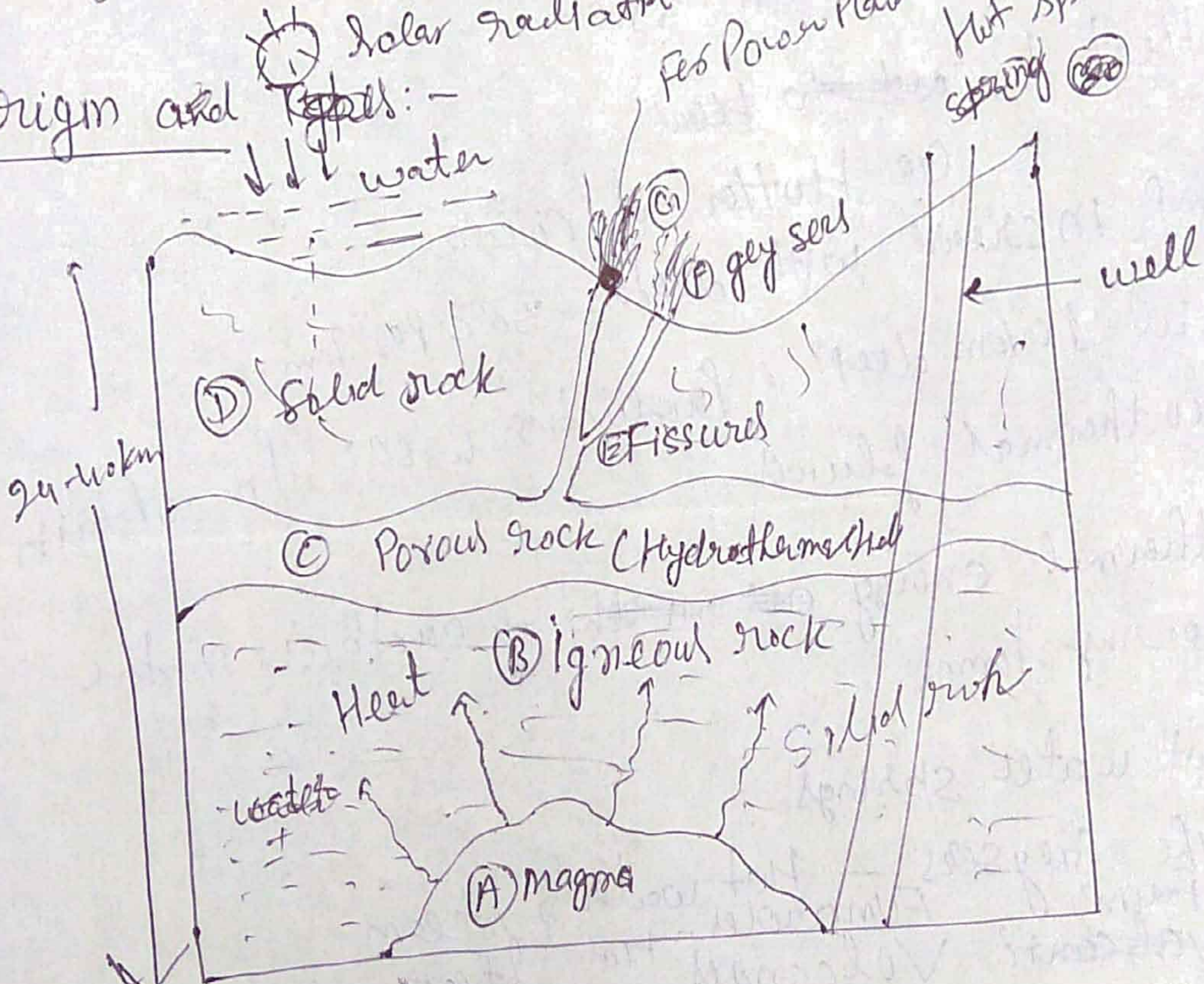
(i) it is a low grade heat energy

(iii) Geothermal fluid also bring in dissolved gases like H_2S, CO_2, NH_3 gases and d other Solute which causes air pollution.

(iv) Life of Plant is low compared to Conventional Power Plants

(v) Noise Pollution result from the drilling operation in geothermal fields.

Origin and Types:-



Igneous - Latin word meer - of fire

magma -

(8) (9)

Fig Show the typical geothermal field. The earth is made up of a central core of a radius of about 1350 km and is estimated to be at 4000 - 10000°C The interaction of temp and pressure change results in the melting of some rocks of upper mantle mantle to form 'magma'. The hot ~~reg~~ magma near surface (A) solidified into igneous rock (B). The heat of the magma is conducted upward to this igneous rock. The ground water that finds it way down to this rock through fissures in it will be ~~tay~~ by the heat of the rock or by mixing with hot gases and steam emanating from magma. The heated water will then rise ~~Cor~~ upward and into a porous and permeable reservoir (C) above the igneous rock. it is covered by the layer of solid ~~ign~~ rock (D). it traps the hot water in the reservoir Called hydrothermal field. This solid rock. however has fissured (E) that act as vents of the underground boiler The vents show up as geysers ~~fumaroles~~ fumaroles (F) A well (H) taps steam from the fissures for use in a geothermal Power Plant