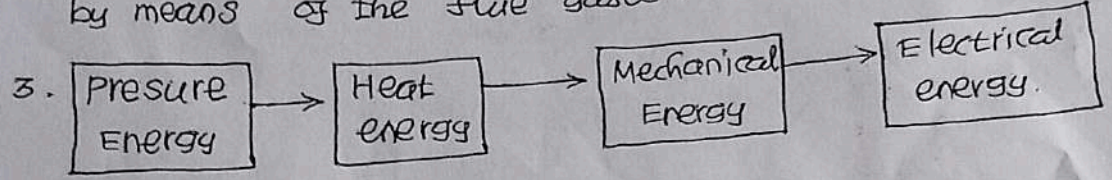


Gas Turbine power plant :

Q: Working principle of gas turbine power plant :

1. Natural gas is used as fuel.
2. Air is compressed to a high pressure and heated by means of the flue gases.

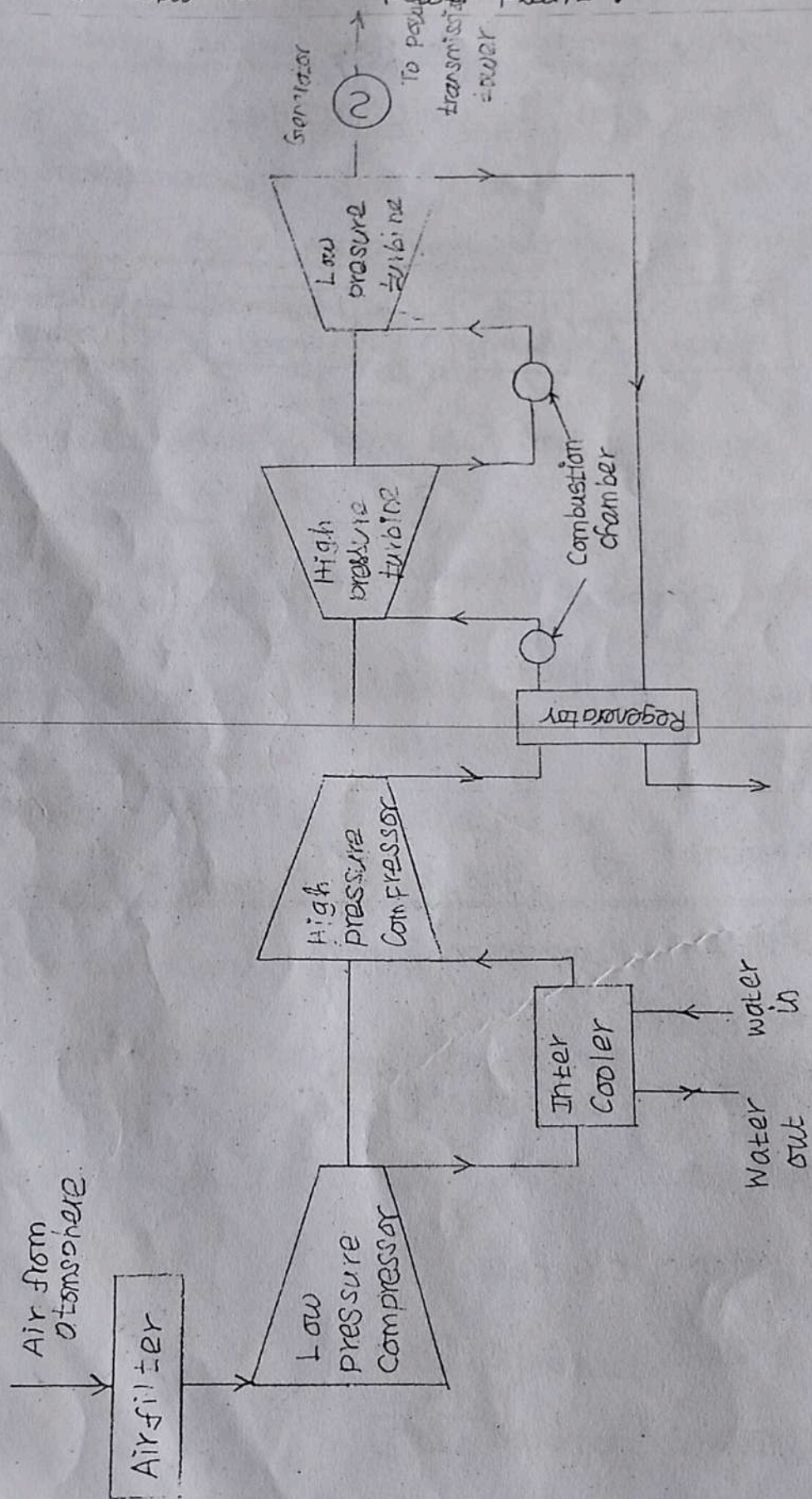


Device	Energy Conversion.
Compressor	Air → Pressure Energy.
Combustion chamber	Pressure Energy → Heat Energy [Air+Fuel]
Turbine	Heat Energy → Mechanical Energy.
Generator	Mechanical Energy → Electrical Energy.

(B) Component of gas turbine power plant :

1. Low pressure Compressor. [LPC]
2. Inter Cooler.
3. High pressure Compressor. [HPC]
4. Regenerator.
5. Combustion chamber.
6. High pressure turbine [HPT]
7. Low pressure turbine [LPT]

Q: layout of Gas turbine power plant :



Layout of gas turbine power plant.

1. L  
LP  
R.  
to

### 1. Low pressure Compressor [LPC] :

Air from the atmosphere is drawn into the LPC through air filter and is compressed.

### 2. Intercooler :

(i) The purpose of intercooler is to reduce the temperature of air entering into the high pressure compressor.

(ii) Intercooler is used to reduce the work of the compressor and increase the efficiency.

### 3. High pressure Compressor [HPC] :

(i) The cooled air coming out of the intercooler is further compressed in the high pressure compressor.

(ii) The pressure and temperature of air further increases in the high pressure compressor.

### 4. Regenerator :

Regenerator is used to preheat the air entering the combustion chamber by using the heat of hot exhaust gases from the turbine.

### 5. Combustion chamber :

(i) Hot air enters from the regenerator and is injected into the combustion chamber.

(ii) Combustion takes place and the gases at high temperature and pressure are passed to the turbine.

Layout of gas turbine power plant.

6. High pressure Turbine [HPT] :

(i) Hot combustion gases expanded in the high pressure turbine.

(ii) Almost 66 to 70% of the total power is ~~developed~~ <sup>developed</sup> in this stage.

7. Low pressure Turbine [LPT] :

(i) The gases run the LPT and then passed to the atmosphere through regenerator.

(ii) Almost 30 to 35% of the power is developed in this stage.

(A) (B) (i): Advantages of gas turbine power plant :

1. Initial cost is less.
2. Maintenance cost is less.
3. It can operate at high speed.
4. used in water scarcity areas.
5. Less pollution.

(ii) Disadvantages of gas turbine power plant :

1. Life of the plant is less.
2. special cooling methods are required.
3. Poor part load efficiency.
4. operating temperature is high.
5. Overall efficiency of the plant is very less.