Sec-3

Q.1 ⇒ Answer (a) Open Cycle MHD Systems

1. The open cycle MHD generator uses coal as a fuel as it produces more conductive plasma. This is because of more carbon atom as compared to hydrogen atom (as the presence of hydrogen is undesirable in MHD).

2. The working temperature in the open cycle MHD generator lies approximately in the range above 2300° C.

3. This is lower temperature limit and below this the effective electrical conductivity becomes zero.

4. There may be no limit in the upper working temperatures, so far the materials can stand with high heat fluxes under high electric field.

(b.) Closed Cycle MHD System ⇒

1. Fig. 3.11.2 shows the schematic diagram of closed cycle MHD generator.

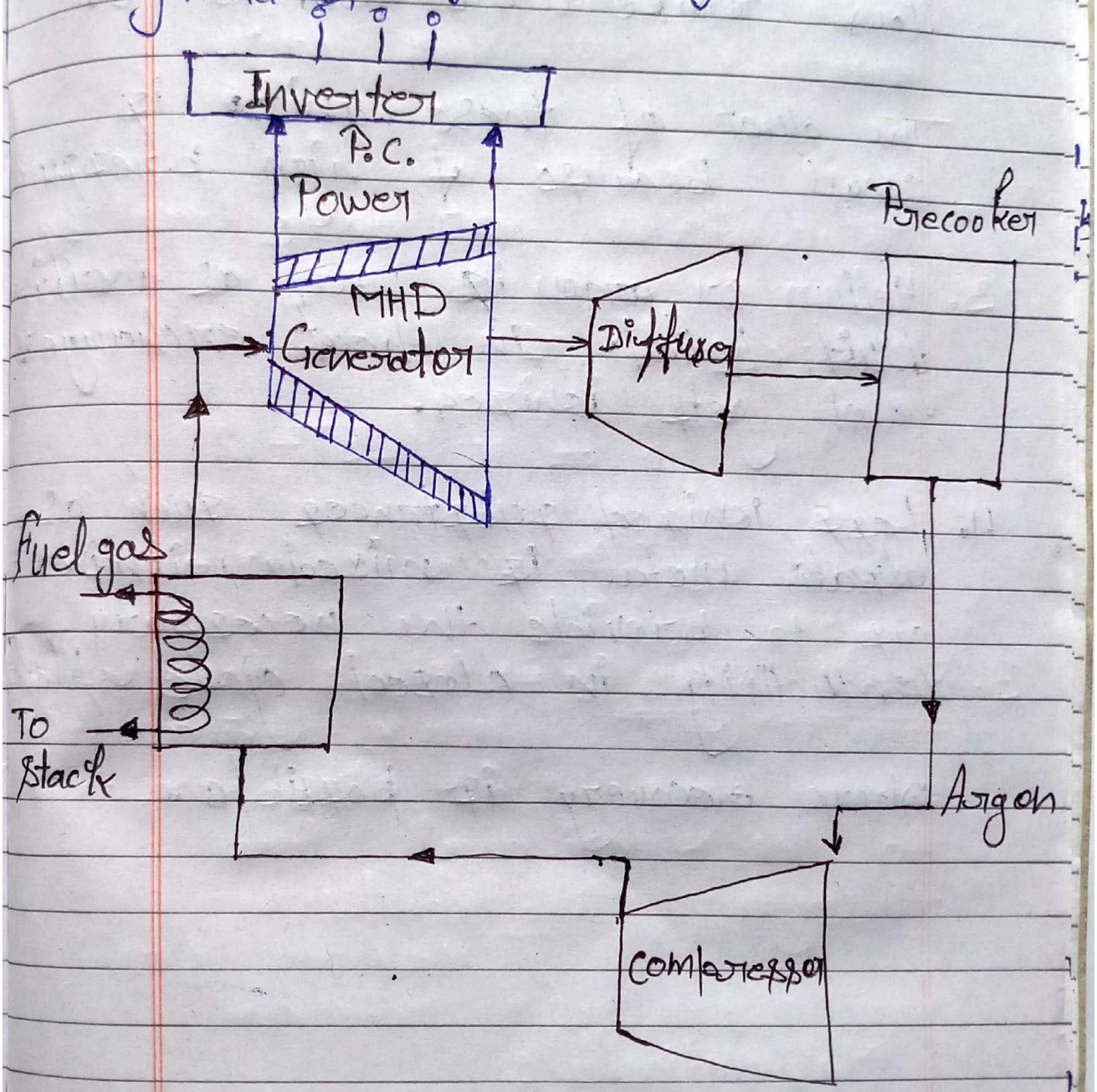

Fig. 3.11.2. Closed cycle MHD generator

2. The very high thermal efficiency is achieved with low cycle cost in closed cycle plant and provides more useful power at low temperature at 1600°C.

The duct of these units is small because of high pressure.

3. Helium or argon is used as working fluid, heated in heat exchanger and gets ionized.

4. Less ionised substances such as alkali metal is mixed with inert gas to provide the necessary conductivity in closed cycle plant, where recovery is possible.