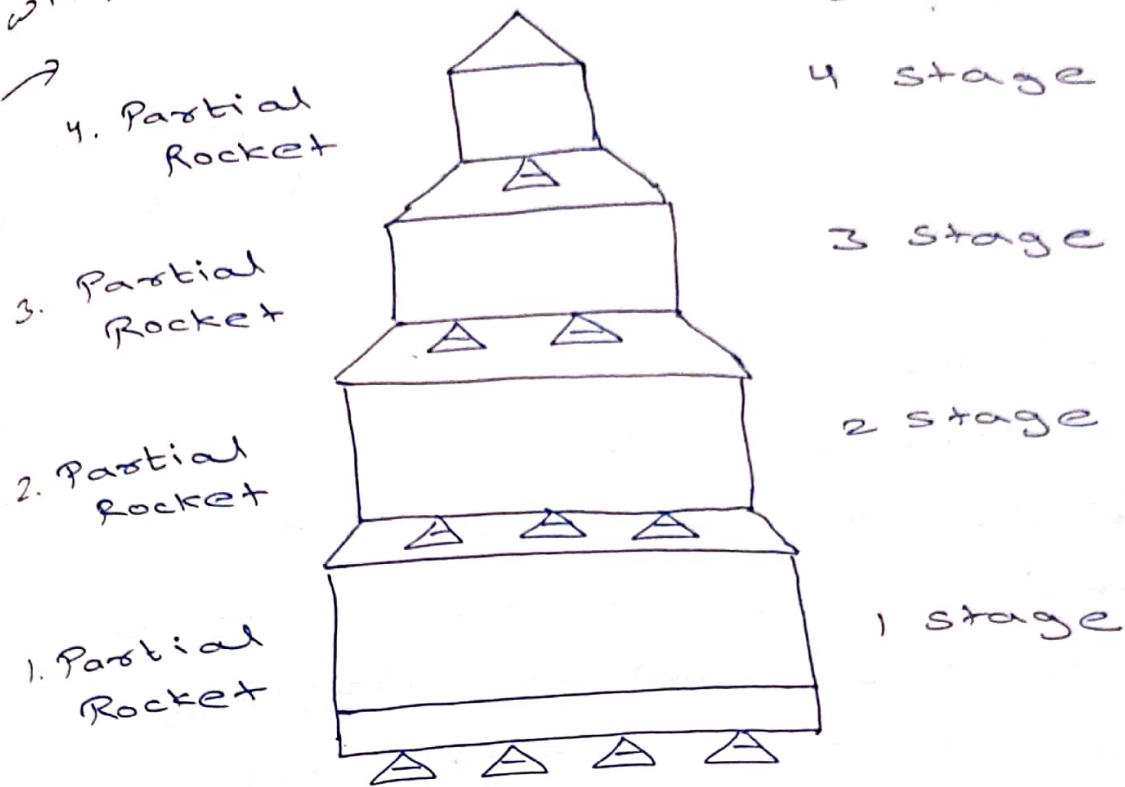


Assignment :- 1

Q.1. What is staging in rockets, explain with the help of neat sketches.

Payload



Staging means to construct a rocket such that some tanks & engines are integrated into one stage which can be jettisoned after use thereby reducing the mass to be further accelerated.

Multistage rocket is a rocket that uses two or more stages each of which contains its own engines & propellant. A tandem or serial stage is mounted on top of another stage, a parallel stage is attached alongside another stage.

Stage (step).

It is complete propulsion unit with motor, propellant feed system, tank, propellant together with control equipment, which is disconnected completely when all the propellant of that stage is consumed.

Series Staging

In a series staged rocket, the second stage fires after the first stage is finished. The series staging is also known as tandem staging. Some of the best examples are Explorer & Saturn V.

Parallel Staging

It is defined as staging a vehicle such that the upper stage engines are also used during lower stage operation. This is usually accomplished by arranging the stages alongside one another.

G.g:- Titan III C.

Q.2. Difference betn ballistic missile & cruise missile.

Ballistic Missile	Cruise Missile.
1) Propellant only for brief duration after the launch	1) Self propellant till the end of its flight.
2) Similar to rocket engine	2) Similar to jet Engine.
3) Low precision, trajectory depends on gravity	3) Hits targets with high precision.
4) Heavy payload carrying capacity.	4) Payload capacity limited.
5) Usually carries a multiple payload.	5) Can carry a single payload.
6) Developed primarily to carry nuclear warhead.	6) Developed to carry conventional warhead.
7) E.g:- Agni-I Dhanush	7) E.g:- Brahmos