

THEORY OF ORIGIN OF SOLAR SYSTEM

अद्वैतवादी सिद्धांत

MONISTIC THEORY

द्वैतवादी सिद्धांत

DUALISTIC THEORY



न्यूटन

Newton.



Every object or body attracts other body
प्रत्येक पिण्ड दूसरे पिण्ड को आकर्षित करता है।



न्यूटन

गुरुत्वाकर्षण का नियम दिया | Law of Gravitation

गति का नियम
Law of Motion

First Law

Law of Inertia

जड़त्व का नियम

Gaseous hypothesis of Kant(1755)

आधुनिक पदार्थ / Primitive

प्राचीन

काण्ट

1755

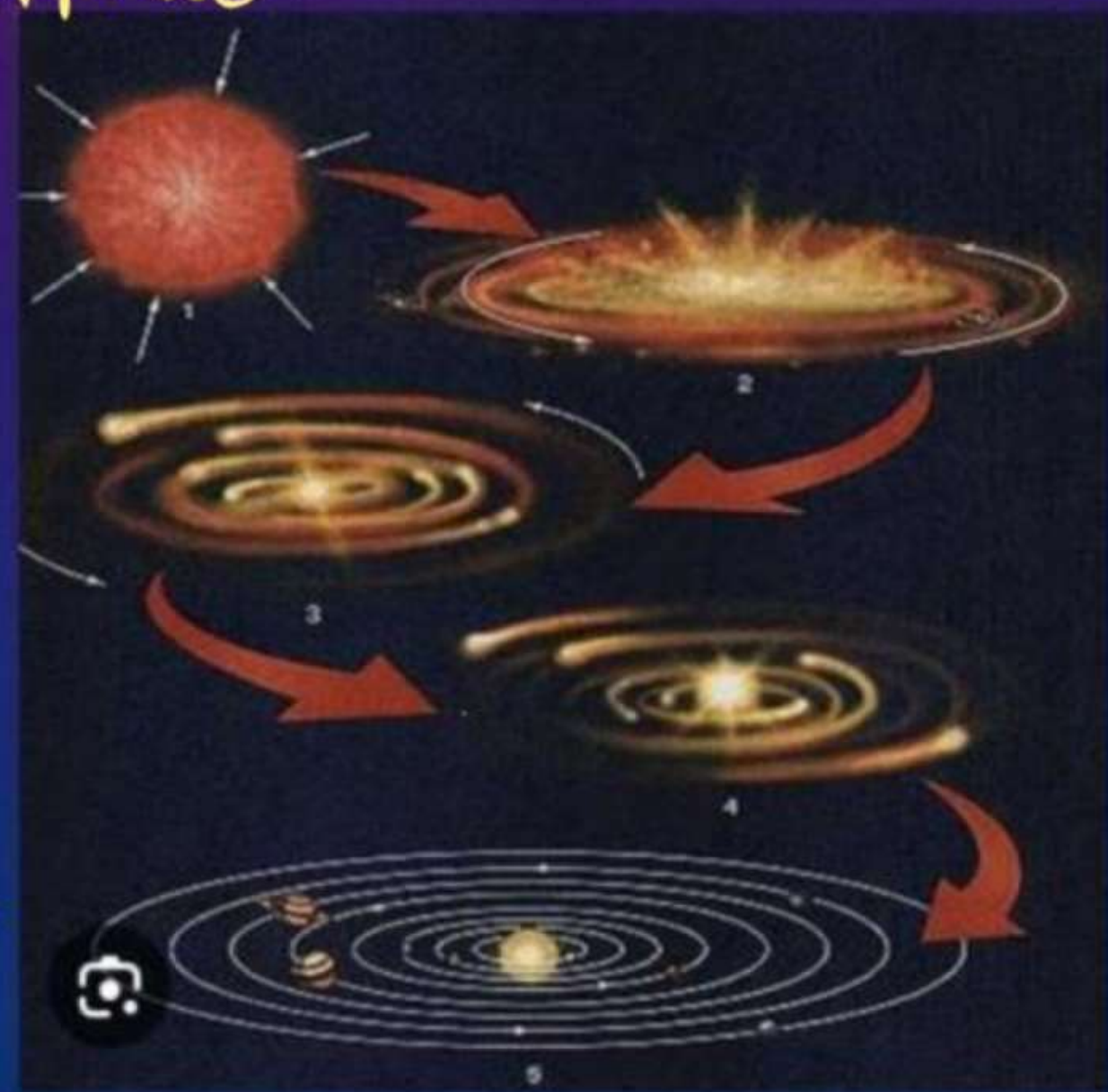
के अनुसार

इस कल्पना में दैव निर्मित
आधुनिक पदार्थ बनें जो
ईधर-उधर बिखरे हुए थे

Primitive

काण्ट की गैसीय परिकल्पना

There was primitive material in Universe.
This was scattered.



इसी दल्लो से
ग्रहों का निर्माण
हुआ।

Planets are
form due
to Ring.

Remaining part of
Nebula is Sun

गिरा रिका को वचा हुआ
भाग सूर्य है

Seprate Rings are
Revolving around the Sun

तब प्ता इससे अलग हुए दल्ले
सूर्य के चारों तरफ गति करने लगे

Gaseous hypothesis of Kant(1755)

- Kant postulated his gaseous hypothesis of the origin of the earth on the basis of a few assumptions. He assumed that supernaturally created primordial hard matter was scattered in the universe.
- In fact, according to Kant there was a primeval, slowly rotating cloud of gas (now called a nebula) and matter comprised of very cold, solid and motionless particles.

Gaseous hypothesis of Kant(1755)

- He further assumed that the particles began to collide against each other under their mutual gravitational attractions. This mutual attraction and collision between the particles generated random motion in the primordial matter. Collision of the particles also generated friction which generated heat, with the result the temperature of the primordial matter started rising

Gaseous hypothesis of Kant(1755)

- He further argued that the random motion of the particles also generated rotatory motion in the primordial matter. Thus, the original cold and motionless cloud of matter became in due course a vast hot nebula and started spinning (rotating) around its axis.

Gaseous hypothesis of Kant(1755)

- According to Kant **with the increase in temperature, the random motion as well as the rate of collision among the particles also increased. This gave extra impetus of the rate of rotatory motion (spinning) of the primordial matter.** The rise in temperature also changed the state of primordial matter from solid to gaseous particles. Thus, **the initial primordial matter gradually changed in hot rotating nebula.** With continuous rise in temperature and rate of rotatory motion the nebula started expanding in size.

the nebula started expanding in size.

rotating nebula. With continuous rise in temperature and rate of rotatory motion

Gaseous hypothesis of Kant(1755)

- According to Immanuel Kant **as the heat increased, the size of nebula increased and as the size of nebula increased, the angular velocity or rotatory speed further increased.** Due to continuous increase in the size of nebula the rotatory speed became so fast that the centrifugal force (away from the centre) exceeded the attractional or centripetal force (directed towards the centre).
- The **nebula started spinning so rapidly that an irregular ring was separated from the middle part of the nebula and was ultimately thrown off due to centrifugal force.** By the repetition of the same process a system of concentric rings (nine) were separated from the nebula. The residual central mass of the nebula remained as the sun.

central mass of the nebula remained as the sun

the same process a system of concentric rings (nine) were separated from the nebula. The residual

Evaluation

मूल्यांकन

1

→ आकार में वृद्धि के कारण वेग में कमी आती है।

Velocity decreases with Respect to Increasing Size.

2

जब ग्रहों का ही निर्माण क्यों हुआ

What is the Reason of Formation of only Nine Planets

3

हल्कर से घूर्णन गति नहीं हो सकती है।

3

Rotation is not Possible due to Collision of Particles

4. यदि सभी ग्रह गर्म एवं घूमती
निहारिका के भाग हैं तो सभी
ग्रहों एवं सूर्य की संरचना
एक समान होना चाहिए
जो कि नहीं है.

if all Planets are
The Part of Rotating
Nebula the structure
of Sun and other
Planets must
be similar but
it is not.

Central Part (के-दीय भाग)

Tail Point

Mains
question

प्रश्न का केंद्र के सिद्धांत का मूल्यांकन कीजिए।
Evaluate Gaseous Theory of Kant?

पर्याप्त?
व्याख्या करें
मूल्यांकन
आलोचना

PAKHI → प्रश्न पढ़ने के बाद सबसे पहले दिमाग में क्या आना चाहिए?

Step 1 → Tail Point → प्रश्न वाचक शब्द

Step 2 → प्रश्न का के-दीय भाग क्या है? Central Point of the question

Step 3 → प्रश्न का मांग क्या है? Demand of the question



Nebular hypothesis of Laplace(1796)

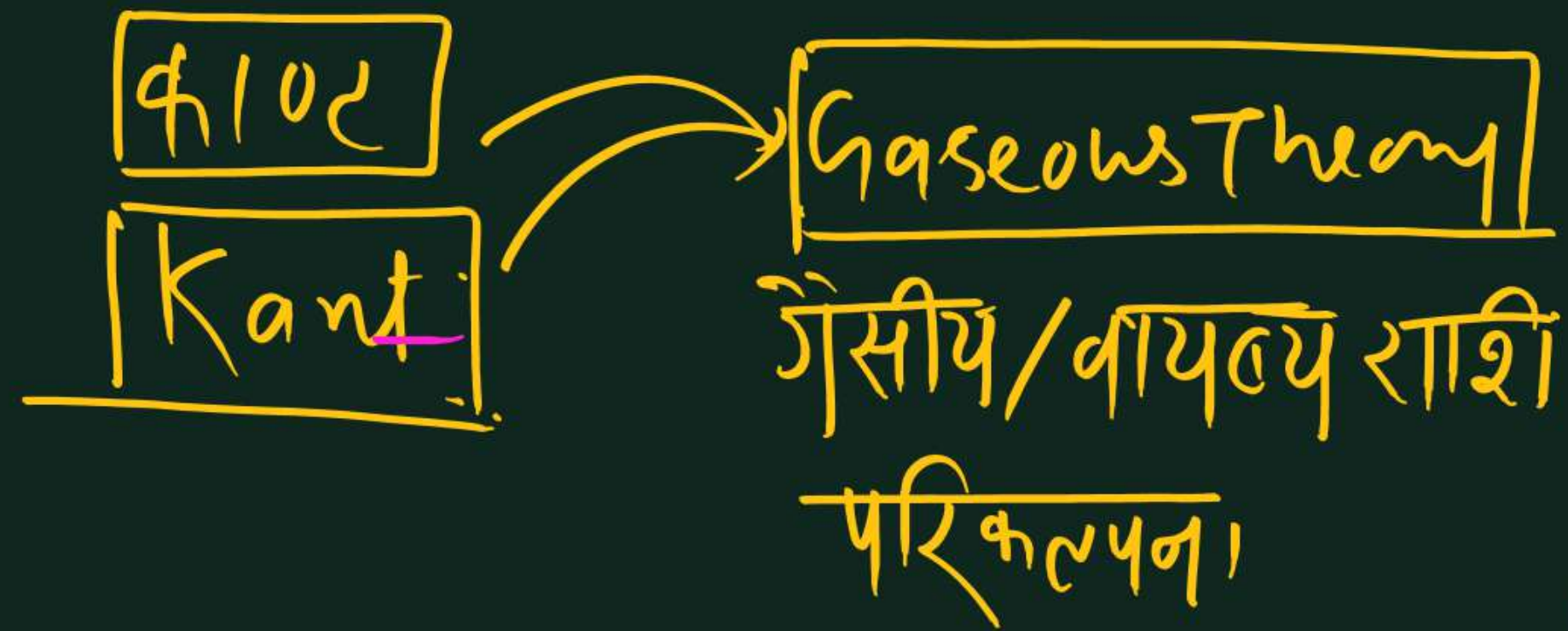
लाप्लास की निहारिका परिकल्पना।

1796

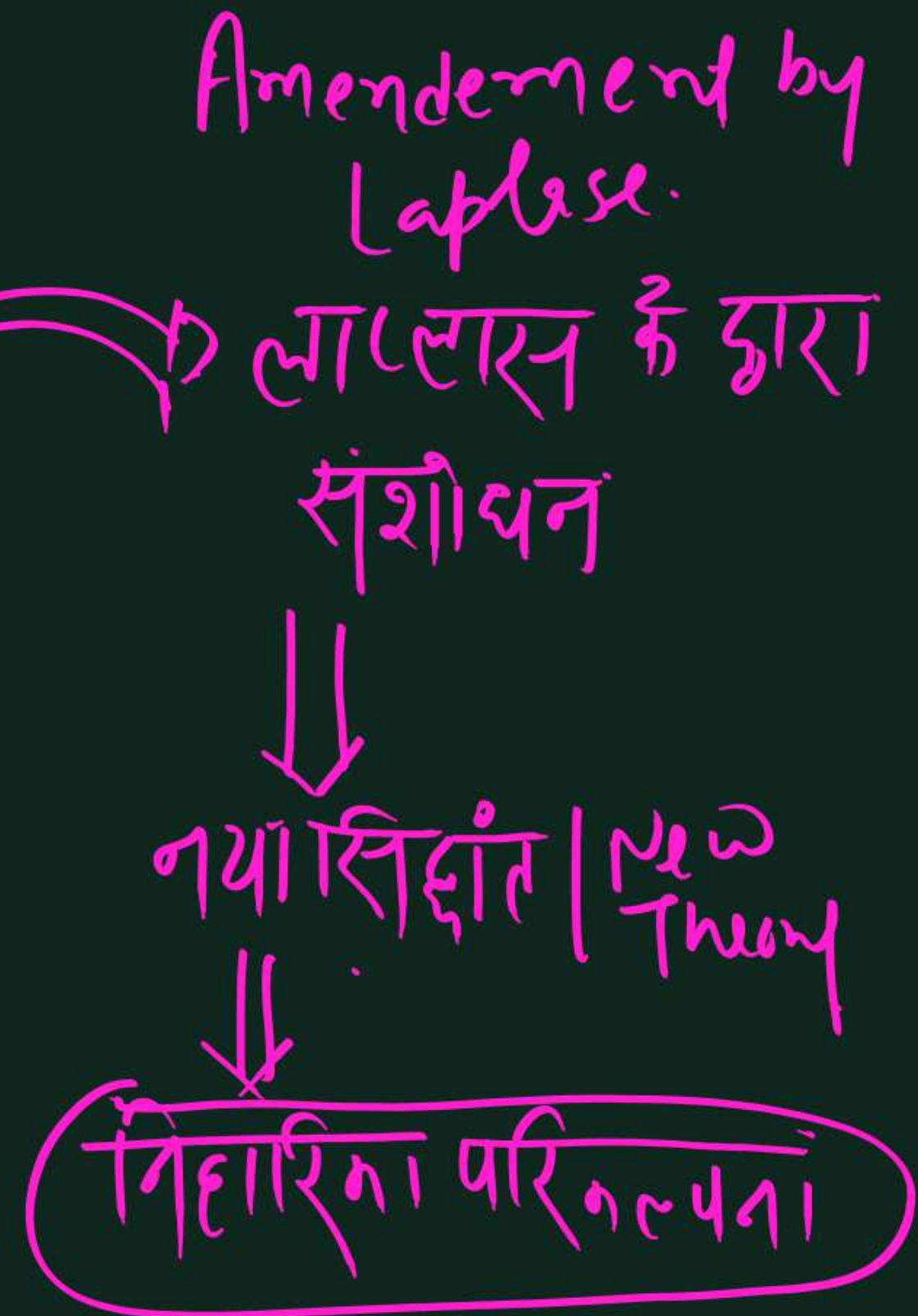
रक्तगिताव | Book.

Exposition of World.
System





Nebular
Concept



लाप्लास की मान्यतायें

Assumption.

There was a presence of
Nebula in universe.

[1] → ब्रह्माण्ड में पहले से ही एक
गिरारिका विद्यमान थी

[2] गिरारिका पहले से ही तप्त (गर्म) थी
Nebula was hot

[3] तप्त गिरारिका पहले से ही घूर्णन
जाति कर रही थी।

Hot Nebula was Rotating

A Ring Separated from
Nebula due to Centrifugal
force.

अपके-दोष वल में वृद्धि के कारण निहारिक
से एक दल्ला (Ring) अलग हो गया।

Planets and Sat.
are from due to
Splitting of Ring.

एक दल्ला टूटकर नौ ग्रहों एवं
उपग्रहों में परिवर्तित हुआ।

Nebular hypothesis of Laplace(1796)

hot Rotating
Nebula

→ घूर्णन करती हुई
तप्त गिरहारिका



Nebular Hypothesis



Self-gravity contracts a gas cloud



Conservation of angular momentum
pulls cloud into a disk



Disk begins to rotate



Central mass forms (proto-Sun)

Centrifugal force balances gravitational forces
and a ring forms



Rings forms into a planet

अपके-द्वीप
वृक्ष के गिर

→ Ring
अलग हो गया

वृक्षादुआ गिरा → क्षुप

Assumptions

- He assumed that there was a huge and hot gaseous nebula in the space.
- From the very beginning huge and hot nebula was rotating on its axis.
- The nebula was continuously cooling due to loss of heat from its outer surface through the process of radiation and thus it was continuously reduced in size due to contraction on cooling.

- There was a nebula cloud composed of Helium, Hydrogen, and dust particles, with a size similar to that of the present-day solar system.
- Since, Nebula was continuously reduced in size due to gradual loss of heat from the outer surface of the nebula through radiation.
- Thus, Reduction in the size and volume of the nebula increased the circular velocity (rotatory motion) of the nebula.
- Due to the increase in velocity, nebula started spinning at very fast speed and consequently the centrifugal force becomes so great that it exceeded the centripetal force.



and contracting the central nucleus of the nebula.

- And, Thus the outer ring was separated from the remaining part of the nebula And this separated ring started moving around the nebula.
- Laplace further maintained that the original ring was divided into nine rings and each ring moved away from the outer ring.
- Thus, nine planets were formed from the nine rings and the remaining central nucleus of the nebula become the Sun.

Evaluation/रूपांकन.

① इस सिद्धांत में गैरारिक्ता के उत्पत्ति की व्याख्या नहीं की गयी है।

There is no explanation about origin of nebula.

[2] विहारिका से एक ही वलय बाहर क्यों हुआ?

Why are the Ring ~~not~~ separated from
Nebula.

[3] सभी ग्रह यदि एक ही वलय के टूटने से बने हैं तो इनकी
बनावट एक समान होनी चाहिए।

If all Planets are the Part of Nebula then
Structure of Planets must be similar.

[5] यदि सभी गैहार्क के भाग हैं तो सभी ग्रहों को एक ही दिशा में परिक्रमण करना चाहिए किन्तु शुक एवं अरुण अन्य ग्रहों के साथे विपरित दिशा में परिक्रमण करते हैं।

if all Planets are the part of Nebula then all the Planets must Revolve in similar direction but Venus and Uranus are Revolving in opposite direction with Respect to other Planets.

⑤ सभी ग्रहों का वायुमंडल एक समान होना चाहिए किंतु ऐसा नहीं है।

Atmosphere of all planets must be similar but it is not.

Main question → लालास के सिद्धांत की व्याख्या करते हुए इसकी कमियों की परीक्षा करे। (2002, 12 मार्च)
Explain Laplace Nebular theory and comment
on its about drawback.

Ques → ग्रहों के उपरान्ति से संबंधित कान्ट एवं लाप्लास के सिद्धांतों की तुलनात्मक व्याख्या करें।

(150 ~~words~~ words)
(8 marks.)

Explain Comparison between Kant
and Laplace Theory.

⑤ काण्ट के अनुसार 9 वलय बाहर
निकले।
9 Rings was separated
from Nebula.

⑥ काण्ट के अनुसार आद्य पदार्थ
देव निर्मित थे।
God is Generator of Primedial
Material.

1 to decreasing of
size.
⑤ only one Ring was
separated from Nebula.
गिरारिका से एक ही वलय
बाहर निकला

⑥ लाप्लास गिरारिका के अस्तित्व से
संबंधित कोई जानकारी नहीं देते हैं
There is no explanation about
origin of Nebula in Laplace
Theory