

Details of Solar Nebula

Solar Nebula is a large disc-shaped cloud of gas and dust from which planets, the sun, and other bodies of a solar system are formed.

The word “nebula” is a Latin word for “cloud.” The solar nebula was a twisting, flattened disk of gas and dust from which the solar system originated ~ 4.6 Ga ago, where Nebulae are made of residue and gases- hydrogen and helium. The residue and gases in a cloud are extremely fanned out, however, gravity can gradually pull together the bunches of residue and gas.

What is a Solar Nebula? Firstly, let’s understand what nebula is.

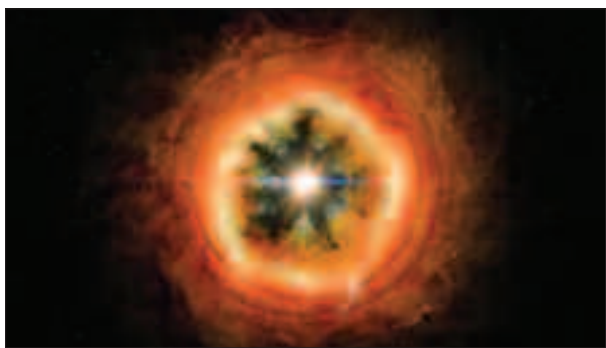
A nebula is an interstellar dust cloud of hydrogen, helium, and other ionized gases.

Initially, the term was utilized to portray any diffused astronomical object, including galaxies past the Milky Way.

The Andromeda Galaxy, for example, was once alluded to as the Andromeda Nebula before the real essence of worlds was affirmed in the mid-twentieth century by Vesto Slipher, Edwin Hubble, and others.

Define Solar Nebula: Solar nebula is a gaseous dust cloud from which, in the purported nebular hypothesis of the source of the solar system, the Sun is formed by condensation.

Development of Nebular Hypothesis: The Nebular hypothesis was developed by a German Philosopher and one of the core Enlightenment



thinkers named Immanuel Kant.

Thereafter, he published his work in his Allgemeine Naturgeschichte und Theorie des Himmels, (i.e., the Universal Natural History and Theory of the Heavens), in the year 1755. Later, this theory was modified by Pierre Laplace in 1796.

So, do you know the nebular theory of formation of our solar system? If not, let’s understand this with the help of nebular hypothesis theory.

Solar Nebular Model: The development and upgrading in the Solar System started about 4.57 billion years prior with the gravitational breakdown of a little piece of a giant molecular cloud.

The greater part of the falling mass gathered in the middle, forming the Sun, while the rest flattened into a protoplanetary disk out of which the planets, moons, space rocks, and other little Solar System bodies framed.

This model, known as the nebular hypothesis, was first evolved in the 18-century by Emanuel Swedenborg,

Immanuel Kant, and Pierre-Simon Laplace.

Nebular Hypothesis Theory: In 1755, the German philosopher Immanuel Kant suggested that a nebula in a gradual rotation is slowly pulled together by its own gravitational force and flattened into a swirling disk that gave birth to the Sun and planets.

During the late 19th century the Kant-Laplace views were unsupported by the British physicist James Clerk Maxwell, who showed that, if all the matter contained in the familiar planets had once been diffused around the Sun in the form of a disk, the shearing forces of differential rotation/twisting would have obstructed the condensation of individual planets.

Was Nebula Hypothesis a Failure?

For quite a few years, most astronomers supported the presumed collision theory, wherein planets were considered to have formed because of a close approach to the Sun by another star.

Protests have been raised to

the theory of collisions, which are more persuasive than those to the Nebular hypothesis, particularly since it was changed during the 1940s.

The masses of the original planets were thought to be greater than in the prior version of the theory, and the obvious distinction in momentum was ascribed to the magnetic forces associating the Sun and the planets.

Hence, the nebular hypothesis consequently became the predominant theory of the inception of the solar system.

What is Nebula Hypothesis?

The nebular hypothesis is the most acknowledged model in the field of cosmogony to explain the formation and evolution of the Solar System, now, let’s get insight into the nebular model:

This theory suggests that our solar system is made up of gas and dust orbiting the Sun.

According to the nebular theory, stars form in massive and dense clouds of molecular hydrogen - giant molecular clouds or GMC.

These giant clouds are gravitationally precarious, and matter combines inside them to more modest denser clumps, which at that point rotate, collapse, and form stars.

Star development is an intricate cycle, which consistently creates a vaporous protoplanetary circle around the youthful star. This cycle may prompt planet development, which is an uncovered actuality up until now.

Rudolf Diesel was passionate about engineering from a young age. At 14, he expressed his desire to become an engineer. After receiving a merit scholarship, Diesel studied at the Royal Bavarian Polytechnic of Munich. Under the mentorship of Carl von Linde, Diesel gained practical experience at an ice and refrigeration plant, where he developed an interest in fuel efficiency.

Diesel’s hard work led to the creation of his first prototype in 1893 and the successful diesel engine in 1897. Despite facing criticism and patent disputes, Diesel’s design proved to be more efficient and adaptable than others.

using a four-stroke combustion cycle:

- **Intake Stroke:** Air enters the cylinders through the intake valve as the pistons move down.

- **Compression Stroke:** The pistons move up, compressing the air.

- **Combustion Stroke:** Fuel is injected and ignited by the heat of the compressed air, forcing the pistons down.
- **Exhaust Stroke:** The pistons move up again, pushing out the exhaust created during combustion.

This internal combustion process makes diesel engines more efficient than steam engines, which burn fuel outside the engine cylinders.

Sara Ali Khan thanks the audience for 'accepting and loving Chumki' from 'Metro...In Dino'



Actress Sara Ali Khan thanked the audience for "accepting and loving Chumki", her character from the recently released romantic entertainer "Metro...In Dino". Treating her InstaFam with some goofy behind-the-scenes photos from Anurag Basu's directorial, Sara penned a heartfelt gratitude note for the viewers.

She wrote on her IG: "Grateful, blessed and so so happy... Thank you for all the love you’ve given our film and thank you accepting and loving Chumki too. P.S clearly there were no middle ground with our moods." Previously, during an exclusive interaction with IANS, Sara revealed that she was

surprised after witnessing director Anurag Basu’s process of putting the film together. She stated that the filmmaker believes in giving his actors a lot of space and this often results in magical moments being created on the camera. Speaking to IANS, the 'Kedarnath' actress said: “I was surprised throughout. I think that the minute you let go some surprising things land up happening. Basu da calls it magic. I feel like just being able to let free, let go and truly be present in the moments that we were because the whole set would come alive. There was just a palpable energy in general so you just had to let go not think and be there. And that was what

we had to flow”.

The third and final chapter of Anurag Basu’s trilogy after "Life in a... Metro" and "Ludo", features Aditya Roy Kapur, Pankaj Tripathi, Sara Ali Khan, Neena Gupta, Konkona Sen Sharma, Anupam Kher, Fatima Sana Shaikh, Ali Fazal, and Saswata Chatterjee in important roles, along with others.

Presented by Gulshan Kumar & T-Series presents, in association with Anurag Basu Productions Pvt. Ltd., "Metro In Dino" has been jointly backed by Bhushan Kumar, Krishan Kumar, Anurag Basu, and Taani Basu. "Metro...In Dino" was released in the cinema halls on 4th July this year.

Sheena Chohan shines as Avali Jijabai in Sant Tukaram's trailer: 'Feeling deeply grateful'



Actress Sheena Chohan has proved her mettle as an actor yet again with her powerful portrayal of Avali Jijabai, Sant Tukaram’s second wife in the forthcoming historical drama "Sant Tukaram".

Expressing her excitement about the overwhelming response to the trailer, Sheena said: "I am thrilled to see the overwhelming response from both the audience and media to the trailer of our upcoming film Sant Tukaram." She added, "The way my character, Avali Jijabai—her look and presence—is being appreciated by industry peers, viewers, and the press has left me feeling deeply grateful and humbled. I truly can’t wait for audiences

across India to experience the film and share their thoughts with us." Sheena has delivered a compelling performance in Aditya Om’s directorial as Avali Jijabai, beautifully portraying the strength, resilience, and quiet complexity of a woman trying to find her place in the saint’s life. Moreover, Sheena recently met with the director of the Dr. Ambedkar International Center, Col. Akash Patel

to discuss "Sant Tukaram". During the interaction, they explored the shared vision of Tukaram and Dr. Ambedkar to eradicate discrimination and promote equality. Set against the backdrop of 17th-century Maharashtra, the movie will journal Saint Tukaram’s story of turning from a grieving husband to a strong voice for the voiceless through his spiritually electrified Abhanga poetry.

Question & Answer Series

Polity & Constitution

1.The 25th Amendment Act, 1971 provided that any law made to give effect to the Directive Principles contained in Article 39 (b) or (c) cannot be challenged on the ground of violation of the rights guaranteed under which of the following articles?

- [A] Article 15, 20 & 32
- [B] Article 16, 18 & 29
- [C] Article 14, 19 & 31
- [D] Article 19, 24 & 26

2.Which of the following is correct with respect to power of Judicial Review of Supreme Court?

- [A] Supreme Court can charge allegations against Prime Minister
- [B] Supreme Court has final authority over all issues
- [C] Supreme Court can review the issues decided by High Courts
- [D] Supreme Court can declare illegal any law of the State

3.What changes were made by the 1st Constitutional Amendment Act of 1951?

- [A] Addition of Article 31B
- [B] Removal of upper population limit for a parliamentary constituency
- [C] Reorganisation of states on linguistic lines
- [D] Restrictions on property rights

4.In what situation, the Governor is supposed to reserve a bill for the consideration of the President?

- [A] If it is against the provisions of the Constitution
- [B] If it endangers the position of the state high court
- [C] If it deals with compulsory acquisition of property under Article 31A
- [D] All of the above

5.Constitution has fixed the maximum and the minimum limits of state legislative councils but who decides the actual strength of a Council?



- [A] President
- [B] Parliament
- [C] State Legislative Assembly
- [D] Governor

6.In which year was the Legal Services Authorities Act, 1987 was amended to provide for the establishment of the Permanent Lok Adalats?

- [A] 2001
- [B] 2002
- [C] 2003
- [D] 2004

7. Who was the first chairman of Press Council of India?

- [A] J R Mudholkar
- [B] Chandramauli Kumar Prasad
- [C] M. Katju
- [D] None of the above

8.What does secularism mean?

- [A] State patronising all religions
- [B] State having its own religion
- [C] State having no official religion and citizens are free to follow any religion or faith
- [D] State having one official religion and showing respect to all other religions

9.“The basic structure of the Indian Constitution cannot be changed”. In which of the following cases, Supreme Court gave this verdict?

- [A] Golak Nath case
- [B] Minerva Mills case
- [C] Kesavananda Bharati case
- [D] None of the above

10.Which one of the

following countries has tricameral legislature with one House for ethnic group?

- [A] South Africa
- [B] Sri Lanka
- [C] Fiji
- [D] Malaysia

11.Who among the following have a right to vote in the Vice-Presidential election but not in the Presidential election?

- [A] Ministers who are not members of either House of the Parliament
- [B] Elected members of the Upper Houses of the States
- [C] Nominated members of the Parliament
- [D] Members of the Parliament who abstain from all meetings of the House for a period of sixty days without permission of the House

12.Which of the following introduced a measure of provincial autonomy?

- [A] Minto-Morley reforms
- [B] Montague-Chelmsford reforms
- [C] Cripps’ Mission
- [D] Government of India Act, 1935

13.Who among the following was never the Lok Sabha Speaker?

- [A] K. V. K. Sundaram
- [B] G. S. Dhillon
- [C] Baliram Bhagat
- [D] Hukum Singh

14.Which of following is not a correct statement with respect to the Preamble of Indian Constitution?

- [A] Preamble is enforceable in court of law
- [B] It depicts the nature of Indian States
- [C] It defines the objective of the Constitution
- [D] It mentions the date of adoption of the Constitution

Answer

- 1. C, 2. D, 3. A, 4. D, 5. B, 6. B, 7. A, 8. C, 9. C, 10. A, 11. C, 12. D, 13. A, 14. A.

1.Which state recently launched the ‘NTR Bharosa pension scheme’?

- [A] Kerala
- [B] Tamil Nadu
- [C] Andhra Pradesh
- [D] Gujarat

2.What is ‘Senna spectabilis’, recently seen in news?

- [A] Invasive plant
- [B] Species of Fish
- [C] Traditional irrigation method
- [D] Communication satellite

3.MK Ranjitsinh & ors v. Union of India & ors case, recently seen in the news, is related with which issue?

- [A] Poverty and Hunger
- [B] Climate change
- [C] Triple Talaq
- [D] None of the Above

4.Sukinda Valley, recently seen in the news, is located in which state?

- [A] Odisha
- [B] Jharkhand
- [C] Sikkim
- [D] Uttarakhand

5.Jimmy Anderson, who recently announced his retirement from international cricket, belongs to which country?

- [A] Australia
- [B] South Africa
- [C] England
- [D] Ireland

6.Which institution recently released the 4th edition of SDG (Sustainable Development Goal) India Index 2023-24?

- [A] NABARD
- [B] NITI Aayog
- [C] Ministry of Jal Shakti
- [D] SEBI

7.Recently, which country secured their second consecutive Copa America championship by defeating Colombia?

- [A] Argentina
- [B] Peru
- [C] Venezuela
- [D] Chile



8.Manjeera Wildlife Sanctuary, recently seen in the news, is located in which state?

- [A] Uttarakhand
- [B] Rajasthan
- [C] Telangana
- [D] Karnataka

9.Recently, which state has opened its first Bird Gallery for enhancing wildlife education and conservation?

- [A] Uttar Pradesh
- [B] Punjab
- [C] Himachal Pradesh
- [D] Uttarakhand

10.Recently, Prime Minister of India inaugurated Indian Newspaper Society (INS) Towers in which city?

- [A] Mumbai
- [B] Bhopal
- [C] Chandigarh
- [D] Patna

11.Svalbard, recently seen in the news, is an archipelago located in which ocean?

- [A] Arctic Ocean
- [B] Indian Ocean
- [C] Atlantic Ocean
- [D] Pacific Ocean

12.Gardi Sugdub Island, recently seen in the news, is located in which sea?

- [A] Caspian Sea
- [B] Black Sea
- [C] Mediterranean Sea
- [D] Caribbean Sea

13.Which state government recently introduced first witness protection scheme for better justice

delivery?

- [A] Assam
- [B] Manipur
- [C] Sikkim
- [D] Nagaland

14.Recently, which state government launched the ‘Mukhyamantri Kisan Samman Nidhi’ scheme?

- [A] Bihar
- [B] Odisha
- [C] Gujarat
- [D] Rajasthan

15.Nirman Shramik Mrtyu Evam Divyaang Sahaayata Yojana, recently seen in the news, is associated with which state?

- [A] Jharkhand
- [B] Haryana
- [C] Chhattisgarh
- [D] Bihar

16.Alexandria, a port city recently in the news due to the visit of INS Tabar, is located in which country?

- [A] Indonesia
- [B] France
- [C] Egypt
- [D] India

17.Which organization has recently captured an epic view of the largest volcano in our solar system named Olympus Mons using the Mars Odyssey orbiter?

- [A] ROCOSMOS
- [B] JAXA
- [C] NASA
- [D] CNSA

18.Recently, which country’s Navy has signed a deal with India’s Garden Reach Shipbuilders and Engineers (GRSE) for an 800-tonne ocean-going tug?

- [A] Myanmar
- [B] Sri Lanka
- [C] Bangladesh
- [D] China

Answer

- 1. C, 2. A, 3. B, 4. A, 5. C, 6. B, 7. A, 8. C, 9. D, 10. A, 11. A, 12. D, 13. A, 14. D, 15. C, 16. A, 17. C, 18. C.

History

1.Which of the following individuals can be counted among the socialist thinkers?

- 1. Friedrich Engels
 - 2. Robert Owen
 - 3. Louis Blanc
 - 4. Immanuel Kant
- Select the correct answer from the codes given below:
- [A] Only 1 and 2
 - [B] Only 1 and 3
 - [C] Only 1, 2, and 3
 - [D] All of the above

2.Consider the following statements:

- 1. Socialist Revolutionary Party was divided into the Bolsheviks and Mensheviks.
 - 2. Bolsheviks wanted that the party membership should be open to all.
- Which of the above is / are correct?
- [A] Only 1
 - [B] Only 2
 - [C] Both 1 and 2
 - [D] Neither 1 nor 2

3.Consider the following statements:

- 1. Bolshevik Russia signed the treaty of Brest Litovsk with Germany in order to pull out of the WWI.
 - 2. ‘Cheka’ was the secret police that punished the critics of Bolshevik party.
- Which of the above is / are correct?
- [A] Only 1
 - [B] Only 2
 - [C] Both 1 and 2
 - [D] None of the above

4.Consider the following statements with respect to the collectivization of agriculture in Soviet Russia:

- 1. The well-to-do peasants, called ‘kulaks’, were particularly targets during this period.
 - 2. Kolkhoz were the collective farms in which all peasants were forced to work.
- Which of the above is / are correct?
- [A] Only 1
 - [B] Only 2
 - [C] Both 1 and 2
 - [D] None of the above

5.The book ‘Spirit of the Law’ is written by which of the following?

- [A] Edmund Burke
- [B] Rousseau
- [C] Montesquieu
- [D] None of the above

6.Which of the following factors helped the rise of the modern nation-states?

- 1) The disintegration of the Holy Roman Empire left a vacuum that came to be filled.
 - 2) The end of feudalism helped their rise
 - 3) The rise of a nation-state on the basis of territory, population, law, and sovereignty.
- Select the correct answer from the codes given below:
- [A] Only 1 & 2
 - [B] Only 1 & 3
 - [C] Only 2 & 3
 - [D] 1, 2 & 3

7.Who became the emperor of Germany in 1871?

- [A] Otto Von Bismarck
- [B] Count Cavour
- [C] Kaiser William I of Prussia
- [D] Victor Emmanuel II

8.Who became the king of united Italy in 1861?

- [A] Giuseppe Mazzini
- [B] Count Cavour
- [C] Victor Emmanuel II
- [D] Giuseppe Garibaldi

9.Who was responsible for the unification of Germany?

- [A] Bismarck
- [B] Garibaldi
- [C] Count Cavour
- [D] Giuseppe Mazzini

10.Who passed the Carlsbad Decrees in 1819 to prohibit activities of students of German Universities and other intellectuals of the German nationalist cause?

- [A] Napoleon Bonaparte
- [B] Otto Von Bismarck
- [C] Mettemich
- [D] None of the above

Answer

- 1. C, 2. D, 3. C, 4. C, 5. C, 6. D, 7. C, 8. C, 9. A, 10. C.