

## WBCS Mains Exam. Paper – III

1. (a)

- **Abolition of the Duties on internal trade and shifting of capital from Murshidabad to Munger were done by Mir Qasim after the Battle of Plassey.**

### Battle of Plassey

শ্রীচিভর্ষ

- The beginnings of British political sway over India may be traced to the battle of Plassey in 1757, when the English East India Company's forces defeated Siraj-ud- Daulah, the Nawab of Bengal.

### Causes of the battle:

- The Company had secured valuable privileges in 1717 'under a royal farman by the Mughal Emperor, which had granted the Company the freedom to export and import their goods in Bengal without paying taxes and the right to issue passes or dastaks for the movement of such goods. The Company's servants were also permitted to trade but were not covered by this Farman and were required to pay the same taxes as Indian merchants.
- This Farman was a perpetual source of conflict between the Company and the Nawabs of Bengal. For one, it meant loss of revenue to the Bengal Government. শ্রীচিভর্ষ  
**'Secondly, the power to issue dastaks for the Company's goods was misused by the Company's servants to evade taxes on their private trade.**
- **Without taking the Nawab's permission, the Company began to fortify Calcutta** in expectation of the coming struggle with the French, who were stationed at this time at Chandernagore.
- Siraj-ud-Daulah interpreted this as an attack on his sovereignty and ordered both the English and French to demolish their fortifications.
- While the French obliged, English refused to do so. This set the stage for a battle which took place on the field of Plassey on 23rd June, 1757. শ্রীচিভর্ষ
- The fateful battle of Plassey was a battle only in name. In all, the English lost 29 men while the Nawab lost nearly 500. The major part of the Nawab's army, led by the traitors Mir Jafar and Rai Durlabh, took no part in the fighting.
- After the battle, Mir Jafar was proclaimed the Nawab of Bengal and the company was granted

undisputed right to free trade in Bengal, Bihar and Orissa. It also received the zamindari of the 24 Parganas near Calcutta.

2. (d)

শ্রীচিভর্ষ

- During Swadeshi movement, he opened co-operative stores and headed the Swadeshi Vastupracharini Sabha.

### Tilak's Home Rule Movement

- Tilak's League was set up in April 1916 and was restricted to Maharashtra (excluding Bombay city), Karnataka, Central Provinces and Berar.
- It had six branches and the demands included swarajya, **formation of linguistic states** and education in the vernacular Languages.
- Its primary objective was to achieve **Self-government** within the British Empire. Tilak gave the popular slogan of "Home Rule is my birth right and I will have it".

### Annie Besant's League

- Annie Besant's League was set up in September 1916 in Madras and covered the rest of India (including Bombay city).
- It had 200 branches, and was loosely organized as compared to Tilak's League.
- Later Tilak's League was merged into Gandhiji's Non-Cooperation Movement.

3. (d)

### Treaty of Yandabo

শ্রীচিভর্ষ

- The first Burmese war was officially declared on 24th February 1824. After an initial setback, the British forces drove the Burmese out of Assam, Cachar, Manipur, and Arakan. The British expeditionary forces by sea occupied Rangoon in May 1824 and reached within 45 miles of the capital at Ava.
- The famous Burmese General Maha Bandula was killed in April 1825. But Burmese resistance was tough and determined. Especially effective was guerrilla warfare in the jungles.
- The rainy climate and virulent diseases added to the cruelty of the war. Fever and dysentery killed more people than the war. In Rangoon 3,160 died in hospitals and 166 on the battlefield. In all the British lost 15,000 soldiers out of the 40,000 they had landed in Burma. Moreover, the war was proving financially extremely costly. শ্রীচিভর্ষ
- Thus, the British, who were winning the war, as well as the Burmese, who were losing it,

were glad to make peace which came in February 1826 with the **Treaty of Yandabo**.

- **The Government of Burma agreed: (1) to pay one crore rupees as war compensation; (2) 'to cede its coastal provinces of Arakan and Tenasserim; (3) to abandon all claims to Assam, Cachar, and Jaintia; (4) to recognise Manipur as an independent state; (5) to negotiate a commercial treaty with Britain. By this treaty, the British deprived Burma of most of its coastline and acquired a firm base in Burma for future expansion.**

4. (d) **Newspapers & their Editors** শ্রীচিওর্স

- **Bal Gangadhar Tilak** helped in the establishment of New English School in the 1880s; which later became the Ferguson College. **He also established newspapers like Mahratta (in English) and Kesari (in Marathi).** From 1889, he edited Kesari and preached nationalism in its columns and taught people to become courageous, self-reliant and selfless fighters in the cause of India's independence.

শ্রীচিওর্স

- **The Comrade was a weekly English language newspaper that was published and edited by Maulana Mohammad Ali between 1911 and 1914.**

- **The Al-Hilal was a weekly Urdu language newspaper established by the Maulana Abul Kalam Azad and used as a medium for criticism of the British Raj in India.**

- Both Al-Hilal and Comrade were suppressed by the British Government during the First World War to curb the revolutionary activity during the war.

- **Amrita Bazar Patrika was published by Sisir Kumar Ghosh and Motilal Ghosh.** It turned overnight into an English newspaper to escape the VPA of 1878.

শ্রীচিওর্স

5. (b) **Rowlatt Act of 1919**

- British government enacted the Anarchical and Revolutionary Crimes Act of 1919, popularly known as the Rowlatt Act. The act was against the basic principle of the rule of law.
- The act was hurriedly passed in the Imperial Legislative Council despite the united opposition of the Indian members.
- It gave the government enormous powers to repress political activities and allowed the detention of political prisoners without trial for two years.

শ্রীচিওর্স

- The Act would thus also enable the Government to suspend the right of habeas Corpus which had been the foundation of civil liberties in Britain.

- **Three of the legislative council members resigned in protest to the act. They were Mohommed Ali Jinnah, Madan Mohan Malaviya and Mazharul-Huq.**

6. (b)

শ্রীচিওর্স

- **Pair 1 and 3 are incorrectly matched:** Widow Remarriage Association is associated with Vishnu Shasstri Pandit and Prathan Samaj is associated with Atmaram Pandurang.

**Social Reform Organizations**

- **Gopal Hari Deshmukh became famous by the pen-name of 'Lokhitawadi'.** He urged people to be self-reliant and seek Western learning. These were, in his view, tools for cultivating a rational outlook and for solving the country's pressing problems.

- **Prarthana Samaj was founded by Dr. Atmaram Pandurang in 1867.** In 1870, Justice Mahadev Gobind Ranade joined this society and much of the work of this society was done by zeal and dedication of Ranade only.

শ্রীচিওর্স

- The two main planks of the Prathana Samaj were worship and social reforms.

- On 6 October 1839, **Debendranath Tagore established Tattwabodhini Sabha** which was shortly thereafter renamed the Tattwabodhini ('Truth-seekers') Sabha. Initially confined to immediate members of the Tagore family, in 2 years it mustered over 500 members.

- The ideology of the society was closely linked to that of the Manav Dharma Sabha. Besides believing that one God should be worshipped, the society also said real religion is based on love and moral conduct.

7. (a)

শ্রীচিওর্স

- **Raja Rammohan Roy** was an Indian socioeducational reformer who was also known as 'Father of Modern India' and 'Father of the Bengal Renaissance'.

- **In 1809, Rammohan Roy wrote in Persian his famous work Gift to Monotheists.**

- **Atmiya Sabha was started in 1815.** It was a philosophical discussion circle in India where people used to conduct debate and discussion sessions on philosophical topics such as Hindu Vedantism and also used to promote free and collective thinking and social reform.

শ্রীচিওর্স

- **From 1818, he started a long crusade against the evils of Sati custom.** He set out to rouse public opinion on the question by citing the authority of the oldest sacred books that the Hindu religion right from its origin is opposed to the practice of Sati. শ্রীচিভর্ষ
- **Brahmo Samaj was established in 1828,** whose purpose was to purify Hinduism and to preach theism or the worship of one God. The society was to be based on the twin pillars of reason and the Vedas and Upanishads.

8. (d)

- **Pair 1 and 2 are incorrectly matched:**

Leaders	Place of the revolt of 1857
1. Birjis Qadr	Lucknow
2. General Bakht Khan	Delhi
3. Kunwar Singh	Bihar <span style="float: right;">শ্রীচিভর্ষ</span>
4. Maulvi Ahmadullah	Faizabad

9. (b)

- **Option (b) is correct: The correct sequence is** Bengal British Indian Society-Madras Native Association-East India Association-Bombay Presidency Association.

### Predecessors of the Indian National Congress

- The Indian National Congress, founded in December 1885, was the first organised expression of the Indian National Movement on an all-India scale. It had, however, many predecessors. শ্রীচিভর্ষ
- The earliest public association in modern India was the Landholders' Society-an association of the landlords of Bengal, Bihar, and Orissa, founded in 1837 with the purpose of promoting the class interests of the landlords.
- Then, **in 1843, was organised the Bengal British Indian Society** to protect and promote general public interests. These two organisations merged in 1851 to form the British India Association. শ্রীচিভর্ষ
- **The Madras Native Association** and the Bombay Association were established in **1852**.
- Lesser-known clubs and associations, such as the Scientific Society founded by Sayyid Ahmad Khan, were established in different towns and parts of the country. All these associations were dominated by wealthy and aristocratic elements called in those days: prominent persons'-and were provincial or local in character.
- **In 1866, Dadabhai Naoroji organised the East India Association** in London to discuss the Indian question and to influence British

public men to promote Indian welfare. Later he organised branches of the association in prominent Indian cities in 1870's.

- **The Madras Mahajan Sabha was started in 1881 and the Bombay Presidency Association in 1885.** শ্রীচিভর্ষ

10. (a)

- **Statement 1 is correct: It was introduced by Reed and Munro in parts of Madras and Bombay Presidencies in the beginning of 19th century.**
- **Statement 2 is correct:** The Ryotwari settlement brought into existence a system of peasant ownership.
- **Statement 3 is incorrect:** It was introduced in Madras and Bombay Presidencies in the beginning of 19th century. শ্রীচিভর্ষ

### Ryotwari Settlement

- **It was introduced by Reed and Munro in parts of Madras and Bombay Presidencies in the beginning of 19th century.**
- Under the system, the cultivator was to be recognized as the owner of his plot of land subject to the payment of land revenue.
- The settlement under this system was not made permanent; but was reviewed periodically after 20-30 years when the revenue demand was usually raised. শ্রীচিভর্ষ
- **The Ryotwari settlement brought into existence a system of peasant ownership. But the peasants soon discovered that the large number of zamindars have been replaced by the one giant zamindari – the state. In fact, the Government later openly claimed that land revenue was rent and not a tax.**

The ryot's right of ownership of his land was also negated by three other factors:

- In most areas the land revenue fixed was exorbitant; the ryot was hardly left with bare maintenance even in the best of seasons.
- The Government retained the right to enhance land revenue at will. শ্রীচিভর্ষ
- The ryot had to pay revenue even when his produce was partially or wholly destroyed by drought or floods.

11. (c)

- **Statement 1 is correct:** The Jatiya Sarkar was a parallel government established in West Bengal. It established Police stations, Courts and a system of revenue collection. It organised an armed Vidyut Vahini commanded by Sushil Kumar Dhara. শ্রীচিভর্ষ

- **Statement 2 is correct:** Karnataka method was a system in which many citizens became part time peasants. Working in farms in the daytime and carrying out sabotage operations at night. In the Quit India Movement many smaller factions within the movement evolved developing different methods of resistance. Some held onto Gandhi's method, others changed to a violent means. The Karnataka method was one such method. শ্রীচিওর্ষ
12. (c) **Day of Deliverance/Youm-e-Nijat**
- The Congress ministries resigned in 1939 to protest against the Viceroy's declaration to make India a party to the Second World War without the approval of people.
  - Subsequently, Muhammad Ali Jinnah (chief of Muslim League) called upon Indian Muslims to celebrate 22nd December 1939 as **Deliverance Day (Youm-e-Nijat) to celebrate the resignation of the rival Congress party from provincial and central offices.**
  - Muslim League tried to bring to light the grievances of Muslims and Muslim groups in Indian states run by Congress governments by documenting pro-Hindu and anti-Muslim bias under Congress governments.
13. (d) The correct order of Mahajanapadas from north to south is: Gandhara-Koshala-Vatsa-Avanti.
- The age of Mahajanapadas** শ্রীচিওর্ষ
- The sixth-century B.C was a period of intense and new political development besides socio-political and religious upheavals that brought two religions to the fore-Buddhism and Jainism. In the later Vedic age, agriculture and iron tools helped people to settle down at one particular place.
  - The permanent settlement led to the foundation of the janapadas or small territorial states under the control of a king. The main area of political activity gradually shifted from Western UP to eastern UP and Bihar. This region was not only fertile due to the rainfall and river systems but also closer to iron production centers. The use of better iron tools and weapons along with sound economic growth resulted in the transformation of some territorial states into Bigger and more powerful states, which came to be known as Mahajanapadas. শ্রীচিওর্ষ
  - There were 16 Mahajanapadas in ancient India. They were: Kasi, Kosala, Anga, Magadha, Vajji, Malla, Chedi, Vatsa, Kuru, Panchala, Machcha, Surasena, Assaka, Avanti, Gandhara and Kamboja.
14. (c) **Astadhyayi**
- Panini wrote a descriptive linguistic treatise called "Astadhyayi". শ্রীচিওর্ষ
  - It covered the whole of Sanskrit language's grammar (including for the Vedic part) and also word formation rules in "sutra" format.
  - It sets the linguistic standards for Classical Sanskrit.
  - It sums up in 4,000 sutras the science of phonetics and grammar that had evolved in the Vedic religion.
  - Panini divided his work into eight chapters, each of which is further divided into quarter chapters.
  - Beyond defining the morphology and syntax of Sanskrit language, Ashtadhyayi distinguishes between usage in the spoken language and usage that is proper to the language of the sacred text. শ্রীচিওর্ষ
15. (b) **Twelve Vows under Jainism**
- For those who want to remain in family life and for whom complete avoidance of five principle sins are difficult, Jain ethics specifies the following twelve vows to be carried out by the householder.
  - Of these twelve vows, the first five are main vows of limited nature (Anuvratas). They are somewhat easier in comparison with great vows (Maha-vratas). The great vows are for the ascetics. শ্রীচিওর্ষ
  - The next three vows are known as merit vows (Guna-vratas), so called because they enhance and purify the effect of the five main vows and raise their value manifold. It also governs the external conduct of an individual.
  - The last four are called disciplinary vows (Shikhsa-vratas). They are intended to encourage the person in the performance of their religious duties. They reflect the purity of one's heart. They govern one's internal life and are expressed in a life that is marked by charity. They are preparatory to the discipline of an ascetic's life. শ্রীচিওর্ষ
  - Three merit vows (Gunavrats) and four disciplinary vows (Shikhsa-vratas) together are known as Seven vows of virtuous conduct (Shilas).
  - A person may adopt these vows, according to his individual capacity and circumstances with the intent to adopt ultimately as great vows.

The twelve vows are described as follows:

- **Five Main Vows of Limited Nature (Anuvratas):**
  - **Ahimsa Anuvrat - Non-violence Limited Vow** শ্রীচিওর্ক
  - **Satya Anuvrat - Truthfulness Limited Vow**
  - **Acharya Anuvrat - Non-stealing Limited Vow**
  - **Bhramacharya Anuvrat - Chastity Limited Vow**
  - **Aparigraha Anuvrat - Nonattachment Limited Vow**
  - **Three Merit Vows (Guna-vrats):**
    - Dik Vrata - Limited area of activity vow
    - Bhoga-Upbhoga Vrata-Limited use of consumable and non-consumable items vow
    - Anartha-danda Vrata - Avoidance of purposeless sins vow শ্রীচিওর্ক
  - **Four Disciplinary Vows (Sikshavratas):**
    - Samayik Vrata - Meditation vow of limited duration
    - Desavakasika Vrata - Activity vow of limiting space
    - Pausadha Vrata - Ascetic's life Vow of limited duration
    - Atithi Samvibhaga Vrata - Limited charity vow
16. (b) **The Kushans**
- The Kushans are also called Yuechis or Tocharians. The Tocharians were considered to be the same as the Scythians. The Kushans were one of the five clans into which the Yuechi tribe was divided.
  - **A nomadic people from the steppes of north Central Asia living in the neighbourhood of China, the Kushans first occupied Bactria or north Afghanistan where they displaced the Shakas. Gradually they moved to the Kabul valley and seized Gandhara by crossing the Hindu Kush, replacing the rule of the Greeks and Parthians in these areas. They eventually established their authority over the lower Indus basin and the greater part of the Gangetic basin.** শ্রীচিওর্ক
  - **Their empire extended from the Oxus to the Ganges, from Khorasan in Central Asia to Pataliputra in Bihar.**
  - A substantial part of Central Asia now included in the Commonwealth of Independent States (in the former USSR), a portion of Iran, a portion of Afghanistan, almost the whole of Pakistan, and almost the whole of northern

India were brought under one rule by the Kushans.

- Because of this, the Kushan empire in India is sometimes called a Central Asian empire. In any case, the empire created a unique opportunity for the interaction of peoples and cultures, and the process gave rise to a new type of culture which embraced nine modern countries. শ্রীচিওর্ক
17. (a)
- The Satavahanas originally seems to have been a Deccan tribe. They however were so brahmanized that they claimed to be Brahmanas. Their most famous king, Gautamiputra Satakarni, described himself as a brahmana and claimed to have established the fourfold varna system which had fallen into disorder.
  - Satavahanas kings were the **first in Indian history to make tax-free land grants to Buddhists and Brahmanas** to gain religious merit. This practice became more prominent in succeeding periods. শ্রীচিওর্ক
  - Gautami Putra Satakarni boasted that he had put an end to the intermixture between the people of different social orders. He considered it their primary duty to uphold the Varna system i.e. the fourfold division of social structure.
  - Satavahanas became prominent in the Indian political scene sometime in the middle of the first century BC. Gautamiputra Satakarni (first century AD) is considered to be the greatest of the Satavahana rulers.
  - He is credited with the extension of Satavahana dominions by defeating **Nahapana, the Shaka ruler of Western India. Simuka was the founder of the Satavahana Dynasty.**
18. (c)
- **Statement 1 is incorrect:** The 'ur' was a village assembly found in areas where the land owners were not Brahmins.
  - **Statement 2 is incorrect:** The Sabha, which was an assembly of Brahmin land owners. This assembly functioned through subcommittees, which looked after irrigation, agricultural operations, making roads, local temples, etc.
  - **Supplementary Notes:** শ্রীচিওর্ক
  - The Nagaram was an organization of merchants. It is likely that these assemblies were controlled by rich and powerful landowners and merchants.

19. (b)

- **Pair 1 is incorrectly matched: Duarte Barbosa was a Portuguese factor** at Cannanore and Cochin in between 1503 and (about) 1517 and had left behind an interesting account on trade and political events of the southeast including Bengal. ঐতিহাস
- He has given a vivid account of the Vijayanagara government under Krishnadeva Raya in his famous book - An Account of Countries bordering the Indian Ocean and their Inhabitants. ঐতিহাস

**Supplementary Notes:**

- **Abdul Razzaq was a Persian Timurid chronicler** and Islamic scholar who was an ambassador of Shah Rukh of Samarqand at the Court of the Zamorin of Calicut.
- He gives an account of the reign of Devaraya II.
- He chronicled his mission to Indian in his book entitled - Matlaus-Sadain wa Majmaul- Bahrain (The Rise of the Two auspicious constellations and the Confluence of the Two Oceans), which was translated into French—and then, in 1855, the translation was translated into English by R.H. Major.
- He also left vivid accounts of the thriving shipping trade in the Indian Ocean during the 14th and 15th centuries.
- Around 1520, **Domingo Paes, a Portuguese adventurer**, visited the Vijayanagara Empire in the Deccan region of southern India.
- He travelled there with a group of traders from Goa's colony at the time. ঐতিহাস
- Paes visited Vijayanagara during the reign of King Krishna Deva Raya, and in his 'Chronica dos reis de Bisnaga', he described his observations of the realm ("Chronicle of the Vijayanagar kings").
- His thorough report is one of the few documented foreign visitor descriptions of the kingdom and its capital, Vijayanagara (Hampi).

20. (a)

- **Statement 1 is Correct:** In Harsha's empire, law and order was not well maintained.
- Hsuan Tsang was robbed of his belongings, although he reports that according to the laws of the land, severe punishments were inflicted for crime. ঐতিহাস
- Robbery was considered to be a second treason for which the right hand of the robber was amputated.

- **Statement 2 is incorrect:** Kannauj assembly was convened to publicise and popularise the doctrines of Mahayana Buddhism (not Hinayana Buddhism). ঐতিহাস
- The Kannauj assembly (643 AD) was held in the honour of Hieun Tsang (Chinese pilgrim).
- **Statement 3 is correct:** Chinese pilgrim Hsuan Tsang, left China in AD 629 for India to study and collect Buddhist texts in Nalanda University (Bihar) during the reign of Harsha.
- Spending many years in Harsha's court, he was able to get general endowments in the favour of Buddhism and ultimately influenced Harsha into a great supporter of Buddhism.

21. (d)

- Vijayanagara forces were defeated at the Battle of Talikota (1565) by the combined armies of Bijapur, Ahmadnagar, and Golconda.

**Battle of Talikota (1565)**ঐতিহাস

- After the death of Krishnadeva Raya in 1529, his successors were troubled by rebellious nayakas or military chiefs. By 1542, the control at the centre had shifted to another ruling lineage, that of the Aravidu dynasty of Vijayanagar Empire, which remained in power till the end of the seventeenth century.
- During this period, the military ambitions of the rulers of Vijayanagara as well as those of the Deccan Sultanates resulted in shifting alignments. Eventually, this led to an alliance of the Sultanates against Vijayanagara.
- In 1565, Rama Raya, the chief minister of Vijayanagara, led the army into battle at Rakshasi-Tangadi (also known as Battle of Talikota), where his forces were routed by the combined armies of Bijapur, Ahmadnagar, and Golconda. ঐতিহাস
- The Battle of Talikota (or Tellikota) (January 26, 1565) constituted a watershed battle fought between the Vijayanagara Empire and the Deccan sultanates, resulting in a rout of Vijayanagara, ending the last great Hindu kingdom in South India.
- Talikota situates in northern Karnataka, about 80 km to the southeast of the city of Bijapur.
- On January 26, 1565, the Deccan Sultanates of Ahmednagar, Berar, Bidar, Bijapur, and Golconda formed a grand alliance to meet the Vijayanagara army. ঐতিহাস
- They met at Talikota situated on the alluvial banks of the Krishna River, in present day Karnataka state, between the two villages Rakkasa and Tangadi.

- The battle represented one of the few times in medieval Indian history that factions employed a joint strategy.
22. (b) **Artists in Humayun's Court** শ্রীচিভর্ষ
- Mughal emperors introduced their own style of painting with Persian inspirations and added new themes, colours and forms.
  - Court scenes were depicted in grandeur. The background was usually hilly landscapes. Flowers and animals were also vastly depicted and in these the Indian artists applied their own skills to develop on the Persian ideas.
  - The Mughal paintings are characterized by their subtleness and naturalism and often depict historical events or court life.
  - Mir Sayyid Ali and Abdus Samad were the two great artists in the court of Humayun (1530-1556 AD).
  - These two artists also remained active during Akbar's reign and Abus Samad earned the nickname "Shirinqalam".
- Artists in Akbar's Court** শ্রীচিভর্ষ
- Akbar (1556-1605 AD) can be considered as the real founder of the Mughal painting.
  - Akbar had employed more than hundred painters from different parts of the country and lavishly conferred honours on works of great excellence. He had special admiration for the work of Hindu artists, notably Daswanth and Basawan.
  - Several noteworthy works were completed during Akbar's period, which include the illustrated stories of Hamza nama; illustrated Mahabharata called Razm-Nama and the illustrated Ramayana and Timur nama, Babur nama and Akbar-Nama. শ্রীচিভর্ষ
  - By the early 17th century, the Mughal painting had come under the western influence in such devices as the use of light and shade to capture space and volume, aerial perspective and the use of atmospheric effects to indicate spatial recession.
  - The fusion profoundly influenced the Mughal art and constituted one of the most flourishing of artistic exchanges. Akbar's leading court artists – Kesu Das, Manohar, Basawan and Kesu Khurd—were fascinated by the Christian paintings and integrated these themes in their own compositions. শ্রীচিভর্ষ
23. (a)
- **Pairs 2 and 3 are incorrectly matched:** Abdul Hamid Lahori-Shahjahan and Abdus Samad-Humayun

**Author/Artists in the Mughal Court**

- Abdul Hamid Lahori, Abul Fazl and Abdus Samad were present in the courts of Shahjahan, Akbar and Humayun respectively.

**Abul Fazl** শ্রীচিভর্ষ

- Abul Fazl is best known today for his Akbarnama, a three-volume history of the life and empire of its commissioner, the emperor Akbar.
- It was composed in Persian between 1590 and 1596 while more than 49 different artists worked on the illustrations.
- The first volume details the history of Akbar's family back to Timur, and the second volume describes Akbar's own reign as far as 1602.
- The third volume of the Akbarnama, the Ain-i-Akbari, or the "Institutes of Akbar," is the most famous.

**Abdul Hamid Lahori** শ্রীচিভর্ষ

- He was a traveller and historian during the period of Mughal Emperor Shah Jahan who later became a court historian of Shah Jahan. He wrote the book Padshahnama, about the reign of Shah Jahan. He has described Shah Jahan's life and activities during the first twenty years of his reign in this book in great.

## 24. (c)

**Mercantile Class** শ্রীচিভর্ষ

- Karwanis or Nayakas were merchants, who specialised in carrying grains from the rural areas.
- Banjaras have innumerable references in the contemporary literature as a trading group who carried on trade between villages and between village and towns.
- The Multani merchants continued to thrive during this period as well in places such as Delhi, parts of Punjab and Sind.
- Baniya was another important mercantile community in north India and Deccan. Their counterparts were Khattris in Punjab and Komatis in Golconda.
- The Bohras were another prominent mercantile community during the Mughal period. It had a very strong presence in Gujarat, Ujjain and Burhanpur. শ্রীচিভর্ষ
- Some of the other prominent mercantile groups were Chettis (South India), **Kling** (along Coromandel coast upto Orissa), **Komatis** (Telugu speaking merchant group) etc.

25. (c)

- **Statement 2 is incorrect:** Muhtasib became powerful during his reign. **Religious Policy of Aurangzeb** শ্রীচিভা
- Aurangzeb, the 6th mughal ruler known by his regnal title Alamgir was an orthodox Muslim in who aimed to transform India into an Islamic state.
- He banned the construction of new Hindu temples and the repair of old temples.
- He erected mosques at place of Vishwanath temple at Banaras. শ্রীচিভা
- **He also reimposed jiziya tax on non-Muslims in 1679 which was earlier abolished by Akbar in 1579.**
- He was intolerant towards other Muslim sects and is known to have stopped he celebration of Muharram festival both
- He also abolished Nauroz as it was a Zoroastrian practice favoured by the Safavid rulers of Iran. শ্রীচিভা
- In 1675, he executed ninth Sikh Guru, Guru Tegh Bahadurji which resulted in the rebellion of the Sikh community against him.
- **Muhtasib, who was officer entrusted to enforce moral codes became powerful during his regin.**
- **Aurangzeb is known to have issued secular decrees known as Zawabit, in supplement to shara.**
- Though he was proficient in playing the veena, he forbade music in the Mughal court and discontinued the practice of Jharokha darshan or showing himself to public from the balcony as he considered it a superstitious practice and against Islam. শ্রীচিভা

26. (c)

**Political organization in Medieval India**

- **The directly administered territories in the Pala and Pratihara empires were divided into Rashtra, Bhukti (provinces), and Mandala or Visaya (districts).**
- **The Rashtra was under the supervision of Rashtrapati or governor.**
- **Bhukti was under the supervision of Uparika who was expected to collect land revenue and maintain law and order with the help of the army.** শ্রীচিভা
- Visayapati was the head of a district and was expected to do the same within his jurisdiction.
- **Pattala was a more smaller unit of cluster of villages which were headed by Bhojapati.**

- During the period, there was an increase of smaller chieftains or Bhojapatis and these tended to merge with visayapatis and later on the word samanta began to be used indiscriminately for both of them.
- All the officials were paid by giving them grants of rent-free land.

27. (d)

শ্রীচিভা

- **All statements are correct**

**Cultural Contribution of Deccan States**

- The Deccan states had a number of cultural contributions to their credit. Ali Adil Shah (d. 1580) loved to hold discussions with Hindu and Muslim saints and was called a Sufi . He invited Catholic missionaries to his court, even before Akbar had done so. He had an excellent Library to which he appointed the well-known Sanskrit scholar, Waman Pandit. শ্রীচিভা
- The successor of Ali Adil Shah, Ibrahim Adil Shah II (1580-1627) was deeply interested in music, and composed a book called Kitabi-Nauras in which songs were set to various musical modes or ragas. He built a new capital, Nauraspur, in which a large number of musicians were invited to settle. শ্রীচিভা
- **Sultan Muhammad Quli Qutub Shah, a contemporary of Akbar, was very fond of literature and architecture.** He wrote in Dakhani Urdu, Persian and Telugu and has left an extensive diwan or collection. He was the first to introduce a secular note in poetry. Apart from the praise of God and the Prophet, he wrote about nature, love, and the social life of his day. শ্রীচিভা
- In the field of architecture, **Muhammad Quli Qutub Shah constructed many buildings, the most famous of which is the Char Minar.** Completed in 1591- 92, it stood at the centre of the new city of Hyderabad founded by Muhammad Quli Qutub Shah. It has four lofty arches, facing the four directions. Its chief beauty is the four minarets which are four storied and are 48 metre high. The double screen of arches has fine carvings.
- The rulers of Bijapur consistently maintained a high standard and an impeccable taste in architecture. The most famous Bijapur buildings of the period are the Ibrahim Rauza and the Gol Gumbaz. শ্রীচিভা
- The former was a mausoleum for Ibrahim Adil Shah and shows the style at its best. **The Gol**



**Gumbaz which was built in 1660 has the largest single dome ever constructed.** All its proportions are harmonious, the large dome being balanced by tall, tapering minarets at the corner. It is said that a whisper at one side of the huge main room can be heard clearly at the other end.

28. (b)

শ্রীচিহ্ন

- **Statement 1 is incorrect:** The directly administered territories in the Pala and Pratihara Dynasties were divided into bhukti and mandala.

**Pala and Pratiharas**

- **The directly administered territories in the Pala and Pratihara empires were divided into bhukti (provinces), and mandala or visaya (districts).** শ্রীচিহ্ন
- The governor of a province was called uparika and the head of a district, visayapati. **The uparika was expected to collect land revenue and maintain law and order** with the help of the army. The visayapati was also expected to do the same within his jurisdiction. During the period, there, was an increase of smaller chieftains, called samantas or bhogapatis, who dominated over a number of villages.
- The visayapatis and these smaller chiefs tended to merge with each other, and later on the word samanta began to be used indiscriminately for both of them.
- **In the Rashtrakuta kingdom, the directly administered areas were divided into rashtira (provinces), visaya and bhukti. The head of rashtira was called rashtirapati, and he performed the same functions as the Uparika did in the Pala and Pratihara empires.** শ্রীচিহ্ন
- The visaya was like a modern district, and the bhukti was a smaller unit to it. In the Pala and Pratihara empires, the unit below the visaya was called pattala.
- The precise role of these smaller units is not known. It seems that their main purpose was the realization of land revenue and some attention to law and order. Apparently all the officials were paid by giving them grants of rent-free land. শ্রীচিহ্ন
- local officials and the hereditary chiefs and smaller vassals. Similarly, the rashtirapati or governor sometimes enjoyed the status and title of a vassal king.

29. (a)

- Ibrahim Lodi succeeded Sikandar Lodi in 1517
- Daulat Khan Lodi, governor of Punjab (chief Afghan noble) and Rana Sanga of Mewar invited Babur to displace Ibrahim Lodi in India
- First Battle of Panipat in 1526(20th April)
- Gunpowder was used in this battle
- 1527: Battle of Khanwa between Rana Sanga and Babur শ্রীচিহ্ন
- Humayun succeeded Babur in 1530
- He built a new city, Dinpanah at Delhi.
- Built Purana Qila
- 1539: Battle of Chausa – Sher shah defeated Humayun
- 1540: Battle of Kanauj – Sher Khan defeated Humayun
- 1555: Humayun recovered Delhi
- Died after falling from the first floor of his library
- His life was a romantic tale. He went from riches to rags and again from rags to riches.

30. (b)

শ্রীচিহ্ন

- The Mughal Empire was divided into Subas which were further subdivided into Sarkar, Pargana and Gram.
- Subah was the term for a province.
- Subahs were divided into Sarkars, or districts.
- Sarkars were further divided into Parganas or Mahals.
- Initially, there were 12 subahs which were extended to 15 during Akbar's reign.

31. (d)

- **Classification of Indian Languages**
- Languages in India are classified into the following major sub-groups: শ্রীচিহ্ন
- **Indo-Aryan Group of Languages**
  - It is a branch of the larger Indo-European family which came to India with the advent of the Aryans. It is the largest language group of India and around 74% of the Indians speak those languages which belong to this group.
  - **Sanskrit, Prakrit, Hindi, Assamese, Bengali, Punjabi, etc.** belong to this group
- **Dravidian Group of Languages**
  - This group comprises mainly of the languages spoken in the southern part of India. Around 25% of the Indian population is covered under this group. শ্রীচিহ্ন
  - Among these 21 languages of the Dravidian Group, the four major languages of the Dravidian group are:

- Telugu (numerically the largest of all Dravidian languages)
- Tamil (the oldest and purest form of language)
- Kannada
- Malayalam (smallest and the youngest of the Dravidian group)

● **Sino-Tibetan Group of Languages**

- Languages under this group belong to Mongoloid family and stretch to all over the Himalayas, North Bihar, and North Bengal, Assam and up to the North-Eastern frontiers of the nation.
- These languages are considered to be older than the Indo-Aryan languages and are referred to in the oldest Sanskrit literature as Kiratas.
- **Sikkimese, Bhutia, Ladhaki, Kinnauri, Ahom, etc.** are the languages in this group.

**Austriac Group of Languages**

- Languages under this group belong to the Austro-Asiatic sub-family which are represented by the languages of Munda or Kol group and spoken in Central, Eastern, and North-Eastern India.
- The existence of these languages have been much before the advent of the Aryans and was referred to in ancient Sanskrit literature as Nisadas.
- **Santhali** is the most important language in this group. With the exceptions of Khasi and Santhali, all Austro-Asiatic languages on Indian Territory are endangered.

32. (c)

**Sayyid Ahmad Khan**

- **In the rise of the separatist tendency along communal lines, Sayyid Ahmad Khan played an important role.**
- Though a great educationist and social reformer, Sayyid Ahmad Khan became towards the end of his life a conservative in politics.
- **He laid the foundations of Muslim communalism** when in the 1880's he gave up his earlier views and **declared that the political interests of Hindus and Muslims were not the same but different and even divergent.**
- **He also preached complete obedience to British rule.** When the Indian National Congress was founded in 1885, he decided to oppose it and tried to organize along with Raja Shiva Prasad of Varanasi a movement of loyalty to British rule.

- He also began to preach that, since the Hindus formed the larger part of the Indian population, they would dominate the Muslims in case of the weakening or withdrawal of British rule. **He urged the Muslims not to listen to Badruddin Tyabji's appeal to them to join the National Congress.**

33. (b)

- **Statement 1 is incorrect:** Trade in tea and trade with China was still exclusive to the Company.
- **Statement 3 is incorrect:** The debts of the company were taken over by the Government of India after the Charter Act of 1833.

**Charter Act of 1813**

- By the Charter Act of 1813, the **trade monopoly of the Company in India was ended and trade with India was thrown open to all British subjects.**
- **But trade in tea and trade with China was still exclusive to the Company.**
- The Government and the revenues of India continued to be in the hands of the Company.
- **The Company also continued to appoint its officials in India.**

34. (d) **Buddhism**

- The basic tenets of Buddhism are explained through the four major Noble truths. They are:
  - The truth of suffering (**Dukkha**)
  - The truth of the origin of suffering (**Samudya**)
  - The truth of the cessation of suffering (**Nirodha**)
  - The truth of the path to the cessation of suffering (**Magga**)
- It means Life is full of suffering (dukkha). All aspects of life contained the seeds of sorrow. Sorrow was caused by desires. This keeps us caught in samsara, the endless cycle of repeated rebirth, dukkha and dying again.
- If one could get rid of desires and needs, then one could be free and at peace. This can be attained through following the 'Noble Eightfold Path'

35. (a) **Six School of Hindu Philosophy**

- There are six sub-schools that were called the Shada Darshana.
- **These were known as Samkhya, Yoga, Nyaya, Vaisheshika, Mimamsa, and Vedanta.**
- Samkhya, literally 'count', seems to have originated first.

- According to the early Samkhya philosophy, the presence of divine agency is not essential to the creation of the world. শ্রীচিভর্ষ
- The world owes its creation and evolution more to Nature or prakriti than to God.
- This was a rational and scientific view. Around the fourth century AD, in addition to prakriti, purusha or spirit was introduced as an element in the Samkhya system, and the creation of the world was attributed to both.

36. (d)

- **Pair 1 is incorrectly matched:** Raja Man Singh I began construction of Amber Fort in 1592.
- **Pair 2 is incorrectly matched:** Kumbhalgarh Fort has the second longest wall of 36kms in the world after the Great Wall of China.

**Forts in India**

- **Amber Fort, Jaipur** শ্রীচিভর্ষ
  - A UNESCO World Heritage Site, it was the bastion of the Kachwahas of Amber, until the capital was moved to the plains, to what is today Jaipur. The palace, located in craggy hills, is a beautiful melange of Hindu and Mughal styles.
  - **Raja Man Singh I began construction in 1592** and the palace, which was built as a strong, safe haven against attacking enemies, was **completed by Mirja Raja Jai Singh**. The contrast between the harsh exterior and the inviting interior couldn't be more surprising.
  - Made entirely of red sandstone and white marble, visitors are left spellbound by the magnificence of the palace that utilises carvings, precious stones and mirrors. The splendour of the palace is enhanced by the breath-taking vista of the Maota Lake in front.

**Mehrangarh Fort**

- The fort was founded by Rao Jodha in 1459 AD. Within it, the fort contains the Maharaja's palace, several temples and an extensive garden.
- Narrating the true spirit of Rathores, Mehrangarh is one of the best preserved forts in India. Within the fort, **there are magnificent palaces like Sheesh Mahal and Phool Mahal** which will leave you awestruck. শ্রীচিভর্ষ
- There are six different galleries in the Mehrangarh Museum: Elephant's howdahs, Palanquins, Daulat Khana, Armory, Paintings

and the Turban Gallery. National Geological Monument, Nagnecha Mataji Temple, Chamunda Temple and Rao Jodha Desert Rock Park are the tourist attractions in Mehrangarh Fort. শ্রীচিভর্ষ

**Raigad Fort**

- **Raigad was the capital of the Marathas under Chhatrapati Shivaji Maharaj.** It is a hill fort situated in the Mahad, Raigad district. The fort rises 820 metres (2,700 ft) above the sea level and has approximately 1737 steps leading to it.
- "Shiv Raajabhishek" the Coronation ceremony of Shivaji Maharaj was the most significant event at Raigad which also was witness to the death of Chhatrapati Shivaji Maharaj.

37. (b)

- **Statement 2 is incorrect:** It established its earliest factory at Masulipatnam in 1605 and at Pulicat in 1610. শ্রীচিভর্ষ

**Dutch East India Company**

- In 1602, the Dutch East India Company was formed and the Dutch States General-the Dutch parliament-gave it a Charter' empowering it to make war, conclude treaties, acquire territories and build fortresses.
- The main interest of the Dutch lay not in India but in the Indonesian Islands of Java, Sumatra, and the Spice Islands where spices were produced.
- The Dutch East India Company, affected by bankruptcy in 1800 coupled with the revolution in 1830, was forced to sell its possessions to Britain and quit Asia. শ্রীচিভর্ষ
- It established its earliest factory at Masulipatnam in 1605 and at Pulicat in 1610.
- The signing of the Anglo-Dutch Treaty (Treaty of London) between Great Britain and the Netherlands in London on 17 March 1824[1] was primarily a settlement of a long period of territorial and trade disputes between the two countries in Southeast Asia.

38. (d)

- **All statements are correct** শ্রীচিভর্ষ
- **George Curzon (1899-1905)**
  - In 1899 Number of Indian members in Calcutta Corporation were reduced.
  - In 1904 Official Secrets Act curbed freedom of press.
  - Curzon brought in the Indian Universities Act of 1904, which brought all the universities in India under the control of the government.

- The original version was The Indian Official Secrets Act (Act XIV), 1889. This was brought in with the main objective of muzzling the voice of a large number of newspapers that had come up in several languages, and were opposing the Raj's policies, building political consciousness and facing police crackdowns and prison terms.

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- It was amended and made more stringent in the form of The Indian Official Secrets Act, 1904, during Lord Curzon's tenure as Viceroy of India.

39. (b)

**Events in British India**

শ্রীশ্রী

- Nil Darpan is a Bengali play written by Dinabandhu Mitra in 1858–1859. The play was published from Dhaka in 1860.
- Satyendranath Tagore (first to clear ICS) was selected for the Indian Civil Service in June, 1863.
- Arya Samaj is an Indian Hindu reform movement that promotes values and practices based on the belief in the infallible authority of the Vedas. The samaj was founded by the sannyasi Dayananda Saraswati on 7 April 1875.
- Anandamath is a Bengali fiction, written by Bankim Chandra Chattopadhyay and published in 1882.

40. (b)

**Important Tribal Movements**

শ্রীশ্রী

- **Khasi Uprising (1830's):** After having occupied the hilly region between Garo and Jaintia Hills, the East India Company wanted to build a road linking the Brahmaputra Valley with Sylhet. For this, a large number of outsiders including Englishmen, Bengalis and the labourers from the plains were brought to these regions. The Khasis, Garos, Khamptis and the Singphos organized themselves under Tirath Singh to drive away the strangers from the plains. The uprising developed into a popular revolt against British rule in the area. By 1833, the superior English military force had suppressed the revolt.

শ্রীশ্রী

41. (c)

- **Pair 1 is correctly matched:** Vasudev Balwant Phadke, an educated clerk, raised a Ramosi peasant force of about 50 in Maharashtra during 1879, and organized social banditry on a significant scale.
- **Pair 2 is incorrectly matched:** The Kuka Revolt in Punjab was led by Baba Ram Singh and had elements of a messianic movement. It

was crushed when 49 of the rebels were blown up by a cannon in 1872.

- **Pair 3 is incorrectly matched:** Displaced peasants and demobilized soldiers of Bengal led by religious monks and dispossessed zamindars were the first to rise up in the Sanyasi rebellion, made famous by **Bankim Chandra Chatterjee** in his novel Anand Math, that lasted from 1763 to 1800.

- **Pair 4 is incorrectly matched: Paika Bidroha (Paika Rebellion), 1817:** In Odisha briefly shook the foundations of British rule in the eastern part of India. Paikas were essentially the peasant militias of the **Gajapati rulers of Odisha** who rendered military service to the king during times of war while taking up cultivation during times of peace. They unfurled the banner of rebellion against the British under the leadership of **Baxi Jagabandhu Bidyadhara** as early as 1817 to throw off the British yoke.

শ্রীশ্রী

- **Pair 5 is correctly matched: Khasi Revolt, 1833:** After having occupied the hilly region between Garo and Jaintia Hills, the East India Company wanted to build a road linking the Brahmaputra Valley with Sylhet. For this, a large number of outsiders including Englishmen, Bengalis and the labourers from the plains were brought to these regions.

- The Khasis, Garos, Khamptis and the Singphos organized themselves under the leadership of the **Nunklow ruler, Tirath Singh;** against the occupation of the hilly region in order to drive away the strangers from the plains. The uprising developed into a popular revolt against British rule in the area. By 1833, the superior English military force had suppressed the revolt.

- **The Santhals under Sido and Kanhu** rose up against their oppressors, declared the end of the Company's rule and asserted themselves independent in 1854. It was only in 1856 after extensive military operations that the situation was brought under control. Sido died in 1855, while Kanhu was arrested in 1866.

42. (b)

**Indian Puppetry**

শ্রীশ্রী

- **Ravanchhaya:** It is the most theatrical of shadow puppetry and is a popular form of entertainment in the Odisha region. The puppets are made of deerskin and depict bold dramatic postures. They do not have any joints attached to them, making it a more complex art. There

is the use of nonhuman puppets, such as trees and animals as well. The Ravanchhaya artists are thus extremely trained in their art – creating a lyrical and sensitive theatrical narration.

- **Pavakoothu: It is the traditional glove puppet show of Kerala.** It originated in the period around 18th century A.D. The puppets are decorated with colorful headgears, feathers and face paints, which is evidence of a heavy influence of Kathakali dance form. The plays are themed around narrations of Ramayana and Mahabharata.
- **Tholu Bommalata:** It is the shadow theatre of Andhra Pradesh. The show is accompanied by a classical background in the music and themed around mythological and devotional tales of the epics and Puranas. The puppets are larger in size and colored on both sides.
- **Gombeyatta:** It is the traditional shadow puppetry of Karnataka. They are styled and designed on the various characters of the Yakshagana theatres. A unique feature of this puppetry is that more than one puppeteer is used to manipulate the puppets.

43. (c) **Both statements are correct**  
**Shalbhanjika**

- **A salabhanjika is the sculpture of a woman, displaying stylized feminine features, standing near a tree and grasping a branch.**
- **The Shalbhanjika is portrayed in the eastern Torana of Sanchi stupa.** It is one of the loveliest female figures in the whole of Indian art.
- She is holding the branch of a mango tree, with her left hand, while the right hand is adroitly adjusted within the holds of a big branch of the tree, which itself merges into her draperies and jewelry. Posed securely within the framework of the lush fruitbearing tree, she also gives the effect of almost flying off from the tree into outer space.
- She is one of the loveliest fantasies of carvers whose imaginations floated women as flying spirits soaring towards the heavens.

44. (d) **Both statements are correct**  
**Natya Shastra**

- Natya is an amalgamation of dance, drama, and music and included as Pathya (words) from Rig Veda, Abhinaya (gestures) from Yajur Veda, Geet (music) from Sam Veda and rasa (emotions) from Atharva Veda.

- This highlights the divine importance attached to dance in the Indian cultural tradition. From Shiva's tandava dance, which signifies the cycle of creation, preservation, and destruction, to the feminine response of Parvati, Indian mythology is replete with examples of dance forms and expressions.
- Similarly, the engravings of community dancing at Bhimbetka and the sculpture of the Bronze dancing girl of the Harappan civilization highlights the importance of dance as a means of social entertainment.
- **The first formal mention of dance is found in Bharata Muni's famous work Natya Shastra** which gives a most comprehensive and vivid treatise on the various facets of Indian classical dance. The work was compiled between 200 BCE and 2nd century A.D. and describes in detail the techniques, postures, emotions, ornaments, stage and even the audience.
- Bharata Muni describes dance as the 'complete art' encompassing within its scope all other forms of art – music, sculpture, poetry and drama.
- **As per Natya Shastra, there are two basic aspects of Indian classical dance.**
- **Lasya** – It denotes grace, bhava, rasa and abhinaya. **It is symbolic to the feminine features of dance as an art form.**
- **Tandava** – **This is symbolic to the male aspects of dance** and has more emphasis on rhythm and movement.

45. (c)

- **Statement 3 is incorrect:** The new ideals of Mahayana Buddhism inspired the sculptors of Mathura art.

**Mathura Art**

- Mathura art refers to a particular school of Indian art starting in the 2nd century BCE, which centered on the city of Mathura, in central northern India, during a period in which Buddhism, Jainism together with Hinduism flourished in India.
- The Mathura school was contemporaneous with a second important school of Kushana art, that of Gandhara in the northwest. About the 1st century CE, each area appears to have evolved separately its own representations of the Buddha. **The Mathura images are related to the earlier yaksha (male nature deity) figures.**

- Important characteristics of the Mathura School of Art:
- Buddhist to Brahmanical to the sometimes secular theme.
- More stress is given to the inner beauty and facial emotions rather than bodily gesture.
- **Sculptures were made on Whitespotted red stones.** শ্রীচিওর্ষ
- These were not influenced by Greco-Roman techniques to that extent.
- Several Brahmanical deities were first crystallized by this school.
- They were depicted as more human and less spiritual. It was wholly influenced by Indian sculptures.
- In Mathura art tradition, Buddha image has longer earlobes, thicker lips, wider eyes and prominent noses. শ্রীচিওর্ষ
- **The new ideals of Mahayana Buddhism inspired the sculptors.** According to Indian authorities, the creation of the Buddha image was the greatest contribution of the artists of this school. The tradition of this school extended to not only the images of Buddha but to the images of the Hindu pantheon of gods.
- **Unlike the Gandhara School, this school was purely indigenous in its origins and reached its zenith.**

46. (d)

শ্রীচিওর্ষ

**Musical Instruments**

- There are four major traditional categories of musical instruments depending upon the type of instruments that are included in it. They are:

**Awanad/Avanaddha Vadya**

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- These are the membranophone instruments as they contain an outer membrane, which is beaten to take out particular musical sounds.
- These are also known as percussion instruments as one has to strike them to generate musical sound.
- They generally have one or two faces covered with hiding or skin.
- Generally, the musical instruments included in this category are Tabla, Drum, Dhol, Congo, Mrindangum, etc.

**Sushira Vadya**

শ্রীচিওর্ষ

- **These are the aerophones, i.e. this category includes all the wind instruments.**
- The most common instruments include Bansuri (flute), Shehnai, Pungi, Ninkirns, etc.

- Shehnai is a double reeded wind instrument with a widening tube towards the end. It is one of the oldest wind instruments in India.

**Ghana Vadya**

- It is the genre of the solid instruments that do not require any tuning. শ্রীচিওর্ষ
- They are also called the Idiophone instruments.
- The most popular examples of Ghana Vadya are Manjira, Jaltarang, Kanchtarang, Jhanj, Khartal, etc.
- The function of these instruments is to keep rhythm and time with the song that is being sung.

**Tata Vadya**

- These are the Chordophones or the string instruments that function best when their sound is modified by hand.
- Examples include Sitar, Veena, and Violin etc.

47. (c)

শ্রীচিওর্ষ

**Ellora Caves**

- It is one of the largest rock-cut monasterytemple cave complexes in the world, featuring Buddhist, Hindu, and Jain monuments.
- The Brahmanical group of Caves (nos. 13 - 29) was excavated between the 7th and 10th centuries AD.
- Many of the Brahmanical caves at Ellora are dedicated to Shaivism, but the images of both Shiva and Vishnu and their various forms according to Puranic narrative are depicted.
- **Among the Shaivite themes, Ravana shaking Mount Kailash, Andhakasurvadha, Kalyanasundaram** are profusely depicted whereas, among the Vaishnavite themes, the different avatars of Vishnu are depicted.

48. (c)

শ্রীচিওর্ষ

**Sunga Art**

- The Shunga School viewed the human body as the centre of life. It attempted to reproduce on sculptured stone not only the actual features but the feelings of living men and women portrayed against the beauty and harmony of their lives.
- **A good example of Sunga art of the second century B.C. is the jovial figures, the dwarfish Yaksha from the Pithalkhora caves in Central India, carrying a bowl of abundance on his head. The care-free broad smile on his face and his round belly indicate that he is fully satisfied in all respects. The two amulets strung on his necklace ward off evil spirits from his devotees.** শ্রীচিওর্ষ

- The back of his right-hand bears an inscription giving the name of the sculptor as Krishnadasa who was a goldsmith by profession. Generally, Indian art is an anonymous art, as the sculptor or the artist never sought to glorify himself.

49. (d)

**Martial Art****State**

- |                     |            |             |
|---------------------|------------|-------------|
| A. Kalaripayattu    | 4. Kerala  | ਭ੍ਰਾਜਿਭਾਸ਼ਿ |
| B. Gatka            | 1. Punjab  |             |
| C. Pari-Khand       | 3. Bihar   |             |
| D. Inbuan Wrestling | 2. Mizoram |             |

**Martial Arts in India**

- **Kalaripayattu:** One of the oldest martial arts in India, Kalaripayattu, although practiced in most parts of southern India, **originated in the state of Kerala in the 4th century AD.** Kalari, a Malayalam word, refers to a specific type of school/gymnasium/training hall where martial arts are practiced or taught (in this case it's Kalaripayattu). Its most important key is footwork; it also includes kicks, strikes and weapon-based practice. Even women practice this art. Even though Kalaripayattu is used as a means of unarmed self-defense and a way to achieve physical fitness today, it is still rooted in the traditional rituals and ceremonies.
- **Pari-Khanda:** **Pari-Khanda, created by Rajputs, is a form of martial art from Bihar.** It involves fighting using sword and shield. Still practiced in many parts of Bihar, its steps and techniques are widely used in Chhau dance. In fact this martial art forms the basis of Chhau dance in which all its elements are absorbed. The name of this martial art consists of two words, 'Pari' that means shield while 'khanda' refers to sword, thus the use of both sword and shield in this art. ਭ੍ਰਾਜਿਭਾਸ਼ਿ
- **Gatka:** **Gatka is a weapon based martial art form, performed by the Sikhs of Punjab.** The name 'Gatka' refers to the one whose freedom belongs to grace. Gatka features the skillful use of weapons, including stick, Kirpan, Talwar and Kataar. The attack and defense in this art form is determined by the various positions of hands and feet and the nature of weapon used. It is displayed on a number of celebrations in the state including fairs.
- **Inbuan Wrestling:** **A native martial art form of Mizoram, Inbuan Wrestling is believed to have its genesis in 1750 A.D. in Dungtlang village.** It has very strict rules that prohibit stepping out of the circle, kicking

and knee bending. The way to win this is by lifting the opponent off their feet, while stringently adhering to the rules. It also involves catching of the belt (worn around their waist) by the wrestlers. This art form was regarded as a sport only after the people of Mizoram migrated from Burma to Lushai hills.

50. (a)

**Kutum Katam**

ਭ੍ਰਾਜਿਭਾਸ਼ਿ

- **Abanindranath Tagore**, popularly known as Aban Thakur in the last phase of his life, gifted the art world with a beautiful new form of visual expression – by creating sculptures from discarded tree branches and roots, seeds of fruits, drift wood and leftover, unwanted wood.
- He called this work **Kutum Katam which later became popular as Katum Kutum**, as the latter expression was probably easier to pronounce.
- Uprooted trees were converted into tangible wooden sculptures of humans, animals and other works of art that could be treasured. Kutum Katam means art crafted using found objects.

51. (b)

ਭ੍ਰਾਜਿਭਾਸ਼ਿ

- **Statement 1 is incorrect:** All natural earthquakes take place in the lithosphere.
- **Statement 2 is incorrect:** Body waves are generated at the focus and move in all the directions through the body of the Earth (3-dimensional).

**Earthquake**

- An earthquake in simple words is shaking of the Earth.
- It is a natural event, caused due to the release of energy, which generates waves that travel in all directions. ਭ੍ਰਾਜਿਭਾਸ਼ਿ
- The release of energy occurs along a fault, a sharp break in the crustal rocks.
- The point where the energy is released is called the focus or hypocentre of an earthquake. The energy waves travelling in different directions reach the surface. The point on the surface, nearest to the focus, is called epicenter. It is the first one to experience the waves.
- This release of energy is propagated as waves or simply saying Earthquake Waves.

**Earthquake Waves**

ਭ੍ਰਾਜਿਭਾਸ਼ਿ

- The Earthquake Waves are recorded on the seismograph.
- There are basically two types of Earthquake Waves – Body waves and surface waves.

**Body Waves**

- **Body waves are generated at the focus and move in all the directions through the body of the Earth (3-dimensional).** They are the fastest in reaching to the surface. অ্যাচিভার্স
- They are of two types viz. Primary waves/Pwaves and Secondary waves/S-waves.

**Primary waves/P-waves**

- **P-waves moves longitudinally** i.e. the propagation and vibration are in a same direction similar to the sound waves. They are the fastest of all the earthquake waves. They travel through gaseous, liquid and solid materials. অ্যাচিভার্স

**Secondary waves/S-waves**

- S-waves are second to reach at the surface after P-waves. As they can travel only through solid materials of the Earth, they cannot pass through Earth's outer core; therefore their shadow zone is broader than that of P-waves. **This reveals that the outer core of the Earth is not in solid form.**
- **S-waves propagate transversally** i.e. the direction of propagation and the direction of vibration is perpendicular to each other.

**Surface waves**

- Surface waves are generated when the body waves interact with the surface rocks. As they move along the surface and the direction of the vibration is perpendicular to the propagation, these waves are considered as the most damaging one.

52. (a)

- **Pair 3 is incorrectly matched:** Dykes are vertical, wall-like intrusive igneous landform.

**Volcano**

- A volcano is a place where gases, ashes and/or molten rock material 'lava' escape to the ground through fissures and faults, etc.
- It is from asthenosphere that the molten rock materials find their way to the surface.
- If the materials remain below the surface, it is called magma.
- If the materials find a way to come out on the surface, it is called lava.
- These magma and lava form different types of structure called Volcanic Landforms. These landforms can be extrusive, or intrusive.

**Extrusive Landforms**

- The structure formed by Lava and other materials such as Ashes and Pyroclastic materials is called extrusive landforms. These

include Shield Volcano, Composite Volcano, Caldera, and Flood Basalt Province, etc.

- The Shield Volcanoes are formed if the lava has low viscosity. Hence, they are not steep. After the Basalt province, the shield volcanoes are the largest of all the volcanoes. Examples are Mauna Loa, Hawaiian Islands, USA, and Galapagos Islands. অ্যাচিভার্স
- Composite Volcanoes form in many years after multiple eruptions. These volcanoes contain pyroclastic materials and ashes other than the thick and highly viscous magmatic lava. Examples are Mount Kilimanjaro and Mount St. Helens.
- When a large amount of magma erupts in a short time the rock underlying the magma collapses. This result in depressions, called Caldera. These are the most explosive in nature.
- Highly fluid lava, made of basalt when erupting on the surface, it forms a flood basaltic province. The Deccan Trap is one such example. অ্যাচিভার্স

**Intrusive landforms**

- When the magma remains within the lithosphere, cools over there and forms different types of structure, are called intrusive landforms. These include Lacoliths, Phacoliths, Lapoliths, Sills, Dykes, and Batholiths, etc.
- Large bodies of magmatic material that cools in the deeper depth of the crust and develop in the form of large domes are Batholiths. These are the cooled portion of magma chambers.
- Lacoliths are large dome-shaped intrusive bodies with a level base and connected by a pipe-like conduit from below. অ্যাচিভার্স
- When the lava makes its way through cracks and the fissures developed in the land, it solidifies almost perpendicular to the ground. It gets cooled in the same position to develop a **wall-like structure**. Such structures are called dykes. These are the most commonly found intrusive forms in the western Maharashtra area.
- **Sills, unlike dykes, are thin horizontal intrusive igneous landform.**
- **Lapoliths are intrusive volcanic landforms having saucer shape and concave to the sky.** অ্যাচিভার্স

53. (d)

- **Sources for studying Earth's interior** - There are 2 types of sources to study Earth's interior-Direct and Indirect.



**Direct Sources**

- Most of our knowledge about the interior of the earth is largely based on estimates and inferences. Yet, a part of the information is obtained through direct observations and analysis of materials. প্ৰ্যুচিভাৰ্ক
- Volcanic eruption forms another source of obtaining direct information. As and when the molten material (magma) is thrown onto the surface of the earth, during volcanic eruption it becomes available for laboratory analysis.

**Indirect Sources**

- Gravitation is an indirect source. The gravitation force is not the same at different latitudes on the surface. It is greater near the poles and less at the equator. This is because of the distance from the center at the equator being greater than that at the poles. The gravity values also differ according to the mass of material. Gravity anomalies give us information about the distribution of mass of the material in the crust of the earth. প্ৰ্যুচিভাৰ্ক
- **Seismic activity** is one of the most important sources of information about the interior of the earth. The study of seismic waves provides a complete picture of the layered interior.
- Mining activity is both a direct as well as an indirect source for Earth's interior. The most easily available solid earth material is surface rock or the rocks we get from mining areas. Besides mining, scientists have taken up a number of projects like "Deep Ocean Drilling Project" and "Integrated Ocean Drilling Project". These have provided large volume of information through the analysis of materials collected at different depths. Mining is also an indirect source as we can analyse the properties of matter at different depths. We know through the mining activity that temperature and pressure increase with the increasing distance from the surface towards the interior in deeper depths. Moreover, it is also known that the density of the material also increases with depth.
- **Other important indirect sources are meteors and magnetic field.**

54. (c)

প্ৰ্যুচিভাৰ্ক**The Big Splat theory**

- It is now generally believed that the **formation of the moon**, as a satellite of the earth, is an outcome of 'giant impact' or what is described as "**the big splat**".

- A body of the size of one to three times that of mars collided into the earth sometime shortly after the earth was formed. It blasted a large part of the earth into space.
- This portion of blasted material then continued to orbit the earth and eventually formed into the present moon about 4.44 billion years ago.

55. (a)

- **Statement 1 is incorrect:** All the planets were formed in the same period. প্ৰ্যুচিভাৰ্ক

**Our Solar system**

- Out of the eight planets, Mercury, Venus, Earth, and Mars are called the 'inner planets' as they lie between the Sun and the belt of asteroids the other four planets - Jupiter, Saturn, Uranus, and Neptune - are called the 'outer planets'.
- Alternatively, the first four are called Terrestrial, meaning earth-like as they are made up of rock and metals, and have relatively high densities. The rest five are called Jovian or Gas Giant planets.
- Jovian means Jupiter-like. Most of them are much larger than the terrestrial planets and have a thick atmosphere, mostly of helium and hydrogen.
- **All the planets were formed in the same period sometime about 4.6 billion years ago.**

56. (a)

প্ৰ্যুচিভাৰ্ক**Geomorphic Processes**

- The differences in the internal forces operating from within the earth which built up the crust have been responsible for the variations in the outer surface of the crust.
- The earth's surface is being continuously subjected to external forces induced basically by energy (sunlight).
- The external forces are known as exogenic forces and the internal forces are known as endogenic forces.
- The actions of exogenic forces result in wearing down (degradation) of relief/elevations and filling up (aggradation) of basins/depressions, on the earth's surface. প্ৰ্যুচিভাৰ্ক
- **The phenomenon of wearing down of relief variations of the surface of the earth through erosion is known as gradation.**
- The endogenic forces continuously elevate or build up parts of the earth's surface and hence the exogenic processes fail to even out the relief variations of the surface of the earth.
- In general terms, the endogenic forces are mainly land building forces and the exogenic

processes are mainly land wearing forces. The surface of the earth is sensitive. Humans depend on it for their sustenance and have been using it extensively and intensively.

57. (b)

প্র্যাচিভর্ক্স

#### El-Niño

- El Niño is a climate pattern that describes the unusual warming of surface waters in the eastern tropical Pacific Ocean. El Niño is the “warm phase” of a larger phenomenon called the El Niño-Southern Oscillation (ENSO). La Niña, the “cool phase” of ENSO, is a pattern that describes the unusual cooling of the region’s surface waters. El Niño and La Niña are considered the ocean part of ENSO, while the Southern Oscillation is its atmospheric changes. প্র্যাচিভর্ক্স
- El Niño has an impact on ocean temperatures, the speed and strength of ocean currents, the health of coastal fisheries, and local weather from Australia to South America and beyond. El Niño events occur irregularly at two- to seven-year intervals. However, El Niño is not a regular cycle, or predictable in the sense that ocean tides are.
- El-Niño is a complex weather system that appears once every three to seven years, bringing drought, floods and other weather extremes to different parts of the world.
- The system involves oceanic and atmospheric phenomena with the appearance of warm currents off the coast of Peru in the Eastern Pacific and affects weather in many places including India.

#### Teleconnections

প্র্যাচিভর্ক্স

- El Niño events are defined by their wideranging teleconnections. Teleconnections are large-scale, long-lasting climate anomalies or patterns that are related to each other and can affect much of the globe.
- **During an El Niño event, westwardblowing trade winds weaken along the Equator. These changes in air pressure and wind speed cause warm surface water to move eastward along the Equator, from the western Pacific to the coast of northern South America.** প্র্যাচিভর্ক্স
- These warm surface waters deepen the thermocline, the level of ocean depth that separates warm surface water from the colder water below. During an El Niño event, the thermocline can dip as far as 152 meters (500 feet).

- This thick layer of warm water does not allow normal upwelling to occur. Without an upwelling of nutrient-rich cold water, the euphotic zone of the eastern Pacific can no longer support its normally productive coastal ecosystem. Fish populations die or migrate. **El Niño has a devastating impact on Ecuadorian and Peruvian economies.**
- El Niño also produces widespread and sometimes severe changes in the climate. Convection above warmer surface waters bring increased precipitation. Rainfall increases drastically in Ecuador and northern Peru, contributing to coastal flooding and erosion. Rains and floods may destroy homes, schools, hospitals, and businesses. They also limit transportation and destroy crops. প্র্যাচিভর্ক্স
- As El Niño brings rain to South America, it brings droughts to Indonesia, Australia, and India. These droughts threaten the region’s water supplies, as reservoirs dry and rivers carry less water. Agriculture, which depends on water for irrigation, is threatened.
- Stronger El Niño events also disrupt global atmospheric circulation. Global atmospheric circulation is the large-scale movement of air that helps distribute thermal energy (heat) across the surface of the Earth. The eastward movement of oceanic and atmospheric heat sources cause unusually severe winter weather at the higher latitudes of North and South America. Regions as far north as the U.S. states of California and Washington may experience longer, colder winters because of El Niño.

58. (c)

প্র্যাচিভর্ক্স

#### Laterite Soil

- Laterite has been derived from the Latin word ‘Later’ which means brick. The laterite soils develop in areas with high temperatures and high rainfall. These are the result of intense leaching due to tropical rain.
- With rain, lime and silica are leached away, and soils rich in iron oxide and aluminum compounds are left behind. Humus content of the soil is removed fast by bacteria that thrive well in high temperatures. These soils are poor in organic matter, nitrogen, phosphate, and calcium, while iron oxide and potash are in excess. প্র্যাচিভর্ক্স
- Hence, laterites are not suitable for cultivation; however, the application of manures and

fertilizers are required for making the soil fertile for cultivation.

- Red laterite soils in Tamil Nadu, Andhra Pradesh, and Kerala are more suitable for tree crops like cashew nuts.
- Laterite soils are widely cut as bricks for use in house construction. These soils have mainly developed in the higher areas of the peninsular plateau. The laterite soils are commonly found in Karnataka, Kerala, Tamil Nadu, Madhya Pradesh and the hilly areas of Odisha and Assam.

59. (a)

- **Statement 2 is incorrect:** The annual range of temperature is maximum in middle latitudes.

**Koepfen's Scheme of Classification of Climate**

- The most widely used classification of climate is the empirical climate classification scheme developed by V. Koepfen.
- Koepfen identified a close relationship between the distribution of vegetation and climate.
- He selected certain values of temperature and precipitation and related them to the distribution of vegetation and used these values for classifying the climates.
- The annual range of temperature is maximum at equator.

Group	Characteristics
A – Tropical	The average temperature of the coldest month is 18° C or higher
B - Dry Climates	Potential evaporation exceeds precipitation
C - Warm Temperate	The average temperature of the coldest month of the (Mid-latitude) climates years is higher than minus 3°C but below 18°C
D - Cold Snow Forest Climates	The average temperature of the coldest month is minus 3°C or below
E - Cold Climates	Average temperature for all months is below 10°C
H - High	Land Cold due to elevation

- The annual range of temperature refers to the difference between the hottest and the coldest months by taking monthly mean temperatures in each case. This is given according to the difference between the average of the maximum

and minimum temperatures of January and the corresponding average of the July month. Different regions experience different temperatures at the same time. The cold temperature experienced during the month of January and the warmest temperature during the month of July can be vice versa with another region. For instance, we can see that some places generally experience a wet season during summer and as a result, cloudiness and rain reduces the maximum temperature. The hottest month there usually falls a month or two before the arrival of the summer solstice when the afternoon sun is near the zenith and the skies are often clear.

60. (a)

- **Statement 1 is incorrect:** Exfoliated domes are developed from expansion due to unloading and pressure release while exfoliated tors are developed due to differential heating and resulting expansion and contraction of the surface.

**Unloading and Expansion**

- Removal of overlying rock load because of continued erosion causes vertical pressure release with the result that the upper layers of the rock expand producing disintegration of rock masses. Fractures will develop roughly parallel to the ground surface. In areas of the curved ground surface, arched fractures tend to produce massive sheets or exfoliation slabs of rock.
- Exfoliation sheets resulting from expansion due to unloading and pressure release may measure hundreds or even thousands of meters in horizontal extent. Large, smooth rounded domes called exfoliation domes result due to this process.

**Temperature Changes and Expansion**

- With a rise in temperature, every mineral expands and pushes against its neighbour and as temperature falls, a corresponding contraction takes place.
- Because of diurnal changes in the temperatures, this internal movement among the mineral grains of the superficial layers of rocks takes place regularly.
- This process is most effective in dry climates and high elevations where diurnal temperature changes are drastic. These movements are very small still they make the rocks weak due to continued fatigue.

- The surface layers of the rocks tend to expand more than the rock at depth and this leads to the formation of stress within the rock resulting in heaving and fracturing parallel to the surface.
- Due to differential heating and resulting expansion and contraction of surface layers and their subsequent exfoliation from the surface results in smooth rounded surfaces in rocks. In rocks like granites, smoothsurfaced and rounded small to big boulders called tors form due to such exfoliation.

61. (c)

শ্রীচিড়াক্স

**Big Bang Theory**

- Big Bang hypothesis states that all of the current and past matter in the Universe came into existence at the same time, roughly 13.8 billion years ago.
- At this time, all matter was compacted into a very small ball with infinite density and intense heat called a **Singularity**. Suddenly, the Singularity began expanding, and the universe as we know it began. শ্রীচিড়াক্স
- After the initial expansion, the theory maintains that **Universe cooled sufficiently to allow the formation of subatomic particles, and later simple atoms**. Giant clouds of these primordial elements later coalesced through gravity to form stars and galaxies.
- **Planck Epoch (or Planck Era)**, this was the earliest known period of the Universe. At this time, all matter was condensed on a single point of infinite density and extreme heat. This Planck period of time extends from point 0 to approximately 10-43 seconds.
- Two major scientific discoveries provide strong support for the Big Bang theory:
- Hubble's discovery in the 1920s of a relationship between a galaxy's distance from Earth and its speed; and শ্রীচিড়াক্স
- The discovery in the 1960s of cosmic microwave background radiation.
- In March 2014 scientists from the Harvard-Smithsonian Centre for Astrophysics studying characteristics of cosmic microwave background radiation detected evidence to support inflation theory. Their observations, made at Amundsen-Scott South Pole Station, are believed to reflect **the imprint of gravitational waves on the Universe in the first few moments after the Big Bang**.

**Birth of stars**

- Birth of stars happens due to accumulation of cosmic clouds called **nebula** containing primarily hydrogen and helium due to gravitational compression.
- Stars die due to run out of their fusion fuel i.e. hydrogen, fate of a star after its death depends upon its mass.
- Birth or death of any star does not contain any information to either prove or disprove the Big bang theory.

শ্রীচিড়াক্স

62. (b)

**Goldilocks zone or circumstellar habitable zone**

- The definition of "habitable zone" is the distance from a star at which liquid water could exist on orbiting planets' surfaces. Habitable zones are also known as Goldilocks' zones, where conditions might be just right – neither too hot nor too cold – for life.
- When searching for possibly habitable exoplanets, it helps to start with worlds similar to our own. But what does "similar" mean? Many rocky planets have been detected in Earth's size-range: a point in favor of possible life. শ্রীচিড়াক্স
- In the habitable zone, or the area around a star where planetary surface temperatures could allow the pooling of water.
- **Earth is situated in the circumstellar habitable zone of the Sun and it receives huge amount of solar winds, which gets deflected by earth's atmosphere and its magnetic field.**

63. (a)

শ্রীচিড়াক্স

**Parts of Earth**

- The Earth consists of three parts as follows:
- **Baryosphere: it is the central core of the earth. It is filled with molten magma with a large quantity of iron and nickel. Baryosphere has two zones: the inner core region (~800 miles radius) and the outer core region (~1400miles radius).**
- Pyrosphere: it is the middle part of the earth, also known as mantle. It is ~1800 miles in thickness and mainly consists of silica, manganese, and magnesium. শ্রীচিড়াক্স
- Lithosphere: it is the outermost region of the earth, also known as crust. It is 20-25 miles in thickness and mainly has silica and aluminum.

64. (b)

- **Statement 1 is incorrect:** It is a close-ended linear Scale. শ্রুতিভঙ্গ
- **Statement 2 is correct:** Richter scale is logarithmic and based on 10.

**Measurement of Earthquakes**

- Although the curve of Earthquake Waves is recorded at Seismograph, the intensity and magnitude of the Earthquakes are measured by two different scales namely Richter scale and Mercalli Scale.

**Richter scale**

- This scale, developed by Charles Richter, measures the magnitude as related to the energy released during the Earthquake. শ্রুতিভঙ্গ
- **This scale is open-ended** i.e. there is not any end of the scale but, it has never measured any Earthquake of magnitude greater than 8.9.
- **The Richter-scale, in nature, is logarithmic based on 10.** That is, the Earthquake at magnitude 5 is 10 times more powerful than the Earthquake at magnitude 4 and 100 times more than the earthquake at magnitude 3.

**Mercalli Scale**

- The Mercalli Intensity Scale, developed by Giuseppe Mercalli, and expanded to include 12 degrees of intensity Adolfo Cancani. It was further modified again by Harry O. Wood and Frank Neumann and today known as Modified Mercalli Intensity Scale.
- It measures the intensity of an earthquake based on its actual impacts on people, the environment and the Earth's surface.
- **It is a linear close-ended Scale**, scaled from 1-12 or I-XII with zero effect in Intensity 1 Earthquake and total destruction in Intensity 12 Earthquake. শ্রুতিভঙ্গ

65. (a)

- **Pair 2 is incorrectly matched:** Patagonia Plateau is a type of Piedmont plateau.
- **Pair 1 is correctly matched whereas; pair 3 is incorrectly matched:** Colorado Plateau and Bolivian Plateau are examples of Intermontane plateaus. Colorado lies to western part of U.S.A. It is the largest plateau in America.
- **Pair 4 is incorrectly matched:** Colombia Plateau is a flood basalt. শ্রুতিভঙ্গ

**Types of Plateaus**

- **Volcanic Plateau:** A volcanic plateau is formed by numerous small volcanic eruptions that slowly build up over time, forming a plateau from the resulting lava flows. The Columbia

Plateau in the northwestern United States of America and Deccan Traps are two such plateaus. Colombia Plateau: This plateau has been formed as the result of volcanic eruptions with a consequent coating of basalt lava (Flood Basalt Plateau). শ্রুতিভঙ্গ

- **Piedmont plateau:** The surface relief of the Piedmont is characterized by relatively low, rolling hills with heights above sea level between 200 feet (50 m) and 800 feet to 1,000 feet (250 m to 300 m). Its geology is complex, with numerous rock formations of different materials and ages intermingled with one another. Essentially, the Piedmont is the remnant of several ancient mountain chains that have since been eroded away. শ্রুতিভঙ্গ
- **Patagonian Plateau:** It is a Piedmont plateau (Arid Landforms) lying in southern part of Argentina. It is a rain shadow desert plateau. It is an important region for sheep rearing.
- **Flood Basalt plateau:** Large igneous province, also known as a continental flood basalt, plateau basalt, and trap, is deposits that include vast plateaus of basalts, covering large areas of some continents. They have a tholeiitic basalt composition, but some show chemical evidence of minor contamination by continental crust. They are similar to anomalously thick and topographically high seafloor known as oceanic plateaus and to some volcanic rifted passive margins. Colombia has a fine Flood Basalt Plateau. শ্রুতিভঙ্গ
- **Intermontane plateaus** are wide tablelands that are formed or situated between mountain ranges, when a plateau is surrounded by mountains on all sides; Bolivian Plateau is an example of Intermontane plateau.

66. (d)

- **Statement 1 is incorrect:** In geysers, jet of water is usually emitted with an explosion while in hot springs, the water rises to the surface without any explosion.
- **Statement 2 is incorrect:** Hot springs contain dissolved minerals which may be of some medicinal value while they are not found in Geysers. শ্রুতিভঙ্গ

**Hot Springs**

- A hot spring is a spring that is produced when geothermally heated groundwater emerges from the Earth's crust.
- Some hot springs have waters that are cool enough for bathing, but in volcanic areas water

may come into contact with rock that has been heated by magma.

- These hot springs sometimes produce water that is hot enough to kill animals that enter them.
- In non-volcanic areas, water can still be heated geothermally because the temperature of rocks within the Earth increases with depth, and if water percolates deeply enough into the crust, it can gain heat from these rocks and then flow to the surface.

### Geysers

- A geyser is a rare geothermal feature.
- When a large amount of groundwater that is trapped in underground cavities in a volcanic area is heated by the presence of magma and magma heated rocks, the extreme heat turns the water into steam very quickly.
- This causes sudden and immense pressure, which forces huge quantities of water up out of the ground, producing stunning sprays of water shooting up to hundreds of feet into the air. This type of eruption can happen regularly or in cycles

67. (c)

- **Both statements are correct.**

### Planet formation

- Following are considered to be the stages in the development of planets:
- The stars are localized lumps of gas within a nebula. The gravitational force within the lumps leads to the formation of a core to the gas cloud and a huge rotating disc of gas and dust develops around the gas core.
- In the next stage, the gas cloud starts getting condensed and the matter around the core develops into small rounded objects. These small-rounded objects by the process of cohesion develop into what is called planetesimals. Larger bodies start forming by collision, and gravitational attraction causes the material to stick together. Planetesimals are a large number of smaller bodies.
- In the final stage, these large number of small planetesimals accrete to form a fewer large bodies in the form of planets.

68. (b)

### Moon wobble

- It refers to the fluctuations in the moon's orbit – with wobbles occurring as a result of changes in the moon's elliptical orbit and their resulting gravitational pull on the Earth.

- Such changes are part of the moon's natural cycle, in which its 18.6 year span is split down the middle, with half of its cycle seeing more suppressed daily tide levels and the other half amplifying tide levels.

- It influences the moon's gravitational pull and **indirectly affects the flow and ebb of tides on the earth.** In addition, according to a recent study by NASA, every wobble cycle holds the capacity to boost and suppress the earth's tides.

69. (b)

### Interstellar space

- Scientists define the beginning of interstellar space as the place where the Sun's constant flow of material and magnetic field stop affecting its surroundings. This place is called the heliopause. It marks the end of a region created by our Sun that is called the heliosphere. Interstellar space starts after the heliopause.
- The Sun creates this heliosphere by sending a constant flow of particles and a magnetic field out into space at over 670,000 miles per hour. This stream is called the 'solar wind.' Inside the heliosphere, the solar particles are hot but less concentrated. Outside of the bubble, they are very much colder but more concentrated.
- Once we arrive in interstellar space, there would be an increase of "cold" particles around us. There would also be a magnetic field that does not originate from our Sun.

70. (a)

### D Double-Prime (D'')

- **Beneath the lower mantle is a shallow region called D'', or "d double-prime."** In some areas, D'' is a nearly razor-thin boundary with the outer core. In other areas, D'' has thick accumulations of iron and silicates. In still other areas, geologists and seismologists have detected areas of huge melt.
- At the base of the mantle, about 2,900 kilometers below the surface, is the core-mantle boundary, or CMB. This point, called the Gutenberg discontinuity, marks the end of the mantle and the beginning of Earth's liquid outer core.

71. (d)

### Kuiper Belt

- The Kuiper Belt is a doughnut-shaped ring of icy objects around the Sun, extending just beyond the orbit of Neptune from about 30 to 55 AU.

- Similar to the asteroid belt, the Kuiper Belt is a region of leftovers from the solar system's early history. Like the asteroid belt, it has also been shaped by a giant planet, although it's more of a thick disk (like a donut) than a thin belt.
- The Kuiper Belt shouldn't be confused with the Oort cloud, which is a much more distant region of icy, comet-like bodies that surrounds the solar system, including the Kuiper Belt. Both the Oort cloud and the Kuiper Belt are thought to be sources of comets.

**Oort cloud**

শ্রেণিভিত্তিক

- The Oort cloud is the most distant region of our solar system. Even the nearest objects in the Oort cloud are thought to be many times farther from the Sun than the outer reaches of the Kuiper Belt.
- Unlike the orbits of the planets and the Kuiper Belt, which lie mostly in the same flat disk around the Sun, the Oort cloud is believed to be a giant spherical shell surrounding the rest of the solar system. It is like a big, thick-walled bubble made of icy pieces of space debris the sizes of mountains and sometimes larger. The Oort cloud might contain billions, or even trillions, of objects.
- The distance from the Sun to the Oort cloud is so enormous that it's useful to describe it not in the more common units of miles or kilometers, but astronomical units. One astronomical unit (or AU) is the distance between Earth and the Sun. Pluto's elliptical orbit carries it as close as 30 AU from the Sun, and as far as 50 AU. The inner edge of the Oort cloud, however, is thought to be between 2,000 and 5,000 AU from the Sun. The outer edge might be 10,000 or even 100,000 AU from the Sun — that's one-quarter to halfway between the Sun and the nearest neighboring star.

72. (c)

- **Both statements are correct**

শ্রেণিভিত্তিক

**Deltas**

- A river's delta is a feature created by deposition at the river's mouth. These are the wetlands that are created when rivers discharge their water and sediment into another body of water, such as the ocean, a lake, or another river.

**Types of Deltas**

- On the basis of the shape, following are various types of Deltas:

- **Arcuate Delta** is fan-shaped Delta. A bowed or curved Delta with the convex margin facing the body of water. Relatively coarse sediments are formed in this type of Delta. The river activity is balanced with the wind. Example, the River Nile Delta in Egypt and the Ganges Delta in India.
- Delta 'Bird's foot' named from the clawlike shape of a bird foot. When the river flow is greater and the waves are smaller, this shape is produced. They were created as a result of river water depositing finer elements.
- The river is divided into smaller distributaries by deposited alluvial material. Due to the fact that the waves are frequently stronger than the river current, this Delta rarely occurs along ocean shores. These Deltas are also known as finger Deltas. American Mississippi River Delta as an example.
- **Cuspate Deltas is formed where sediments are deposited onto a straight shoreline with strong waves. The waves push the sediments to spread outwardly creating the tooth-like shape. Example, Tiber River of Italy.**
- Estuarine Delta is formed at the mouth of submerged rivers depositing down the sides of the estuary. Example, the Seine River of France, the Deltas of Narmada and Tapi (formerly Tapti) rivers of India.
- Lacustrine Delta is formed when a river flows into a lake. Example, Lough Leanne river Delta, Ireland.
- Truncated Delta: Sea waves and ocean currents modify and even destroy Deltas deposited by the river through their erosional work. Thus, eroded and dissected Deltas are called truncated Deltas.
- Abandoned Delta: When the river shifts its mouth, the Delta already made is left abandoned. Such a Delta is called an abandoned Delta. Example, Yellow river Delta, China and the Western part of Ganga Delta made by Hoogly river, India.

73. (d)

**Aeolian landforms**

শ্রেণিভিত্তিক

- Aeolian landforms are shaped by the wind (named for the Greek God of wind, Aeolus). Aeolian processes create a number of distinct features, through both erosion and deposition

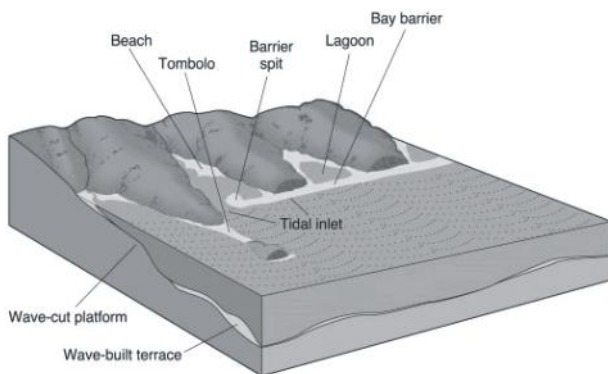
of sediment, including: **Sand dunes, Loess Deposits, Ventifact, Yardangs, Deflation Hollow or Blowout, and Desert Pavement.**

- Aeolian processes involve erosion, transportation, and deposition of sediment by the wind. These processes occur in a variety of environments, including the coastal zone, cold and hot deserts, and agricultural fields. Common features of these environments are a sparse or nonexistent vegetation cover, a supply of fine sediment (clay, silt, and sand), and strong winds. Aeolian processes are responsible for the emission and/or mobilization of dust and the formation of areas of sand dunes. They largely depend on other geologic agents, such as rivers, glaciers, and waves, to supply sediment for transport.

74. (a)

### Coastal landforms

অ্যাচিভার্স



- Coastal landforms can be either depositional or erosional. Beaches, spits and tombolo are examples of depositional landforms.
- Cliffs and caves are examples of erosional landforms. অ্যাচিভার্স
- **Beaches:** Beaches are a common feature of a coastline. Beaches are made up of eroded material that has been transported from elsewhere and deposited by the sea.
- Constructive waves help to build up beaches. The material found on a beach (ie sand or shingle) depends on the geology of the area and wave energy.
- A cross-section of a beach is called a beach profile. The shingle ridges often found towards the back of a beach are called berms.
- **Spits:** Spits are also created by deposition. A spit is an extended stretch of beach material that projects out to sea and is joined to the mainland at one end. অ্যাচিভার্স

- Spits are formed where the prevailing wind blows at an angle to the coastline, resulting in long shore drift. An example of a spit is Spurn Head, found along the Holderness coast in Humberside. অ্যাচিভার্স

75. (d)

### Fluvial Erosional Landforms

- Fluvial Erosional Landforms are landforms created by the erosional activity of rivers. The various aspects of fluvial erosive action include:
  - Hydration is the force of running water wearing down rocks.
  - Corrosion is a chemical action that leads to weathering.
  - Attrition is river load particles striking, colliding against each other, and breaking down in the process. অ্যাচিভার্স
  - Abrasion is the process of Solid River load striking against rocks and wearing them down.
  - Down cutting (vertical erosion) is the erosion of the base of a stream (down cutting leads to valley deepening).
  - Lateral erosion is the erosion of the walls of a stream (leads to valley widening).
  - Head ward erosion is erosion at the origin of a stream channel, which causes the origin to move back away from the direction of the stream flow, and so causes the stream channel to lengthen.
  - Braiding is the main water channel splitting into multiple, narrower channels. A braided river, or braided channel, consists of a network of river channels separated by small, and often temporary, islands called braid bars. Braided streams occur in rivers with low slopes and/or large sediment loads.

76. (c)

অ্যাচিভার্স

- **Statement 1 is incorrect:** The ultimate source of energy behind forces that drive endogenic movements is **earth's internal heat.**

### The force behind Endogenic Movements:

- The ultimate source of energy behind forces that drive endogenic movements is earth's internal heat.
- Earth's internal heat is a result of mainly radioactive decay (50% of the earth's internal heat) and gravitation (causes pressure gradients). অ্যাচিভার্স
- Differences in temperature and pressure (temperature gradients or geothermal gradients and pressure gradients) among various layers of the earth give rise to density differences



and these density differences give rise to conventional currents. শ্রীচিভর্ষ

- Convictional currents in the mantle drive the lithospheric plates (crust and upper mantle) and the movement of the lithospheric plates (tectonics) is the cause behind endogenic movements.
- The Earth's rotation (Coriolis Effect) can influence where convection currents travel.
- The destination of convection currents determines the nature and location of the endogenic movements.

77. (d)

শ্রীচিভর্ষ

#### Translocations

- Movement of soil constituents (organic or mineral) within the profile and/or between horizons. Over time, this process is one of the more visibly noticeable as alterations in colour, texture, and structure become apparent.
- Translocations are similar to losses in that they involve the movement of materials. Translocation differs in that the material is not removed from the soil; instead it moves from one location to another. This internal movement can be divided into illuviation (movement into) and eluviation (movement out of). শ্রীচিভর্ষ
- Eluviation is the process by which a material is removed from a zone. Illuviation is the process by which material moves into a zone. Salts and highly soluble minerals like gypsum and carbonates (lime) can dissolve in the soil water and then move to wherever the water moves. শ্রীচিভর্ষ
- In some cases, they may be lost to the groundwater but in others they may move only short distances in the soil. As the soil water evaporates, the dissolved materials (salts etc.) will precipitate (form solids) out of the water.
- This is common in arid areas, where salts are moved to and concentrated at the soil surface as water evaporates. Burrowing animals from ants to tortoises dig holes and physically translocate soil throughout the soil profile. Likewise, when we dig holes or till the soil we are moving the soil from lower to higher points (and vice versa) in the profile. শ্রীচিভর্ষ
- Clay and organic matter can also be translocated as water physically moves them deeper into the profile as it percolates downward.

78. (d)

#### Orogeny

শ্রীচিভর্ষ

- Orogeny is the primary mechanism by which mountains are formed on continents. An orogeny is an event that takes place at a convergent plate margin when plate motion compresses the margin. An orogenic belt or orogen develops as the compressed plate crumples and is uplifted to form one or more mountain ranges.

- Categorization of orogenic belts into three types: accretionary, collisional, and intracratonic

#### Stages:

শ্রীচিভর্ষ

- **An orogenic belt undergoes several phases of sedimentation, magmatism, metamorphism, and deformation as it evolves into a mountain range.**
- Plate tectonic models are able to provide an explanation for many, if not most, of the changes that occur from one phase to another.

79. (c)

- **Both statements are correct**

শ্রীচিভর্ষ

#### Exogenic Processes

- The exogenic processes derive their energy from atmosphere determined by the ultimate energy from the sun and also the gradients created by tectonic factors.
- Gravitational force acts upon all earth materials having a sloping surface and tend to produce movement of matter in down slope direction.
- Force applied per unit area is called stress. Stress is produced in a solid by pushing or pulling. This induces deformation.
- Forces acting along the faces of earth materials are shear stresses (separating forces). It is this stress that breaks rocks and other earth materials. All the exogenic geomorphic processes are covered under a general term, denudation.

80. (c)

শ্রীচিভর্ষ

#### Pediments and Pediplains

- Landscape evolution in deserts is primarily concerned with the formation and extension of pediments. শ্রীচিভর্ষ
- Gently inclined rocky floors close to the mountains at their foot with or without a thin cover of debris, are called pediments.
- Such rocky floors form through the erosion of mountain front through a combination of lateral erosion by streams and sheet flooding.
- Through parallel retreat of slopes, the pediments extend backwards at the expense of

mountain front, and gradually, the mountain gets reduced leaving an inselberg which is a remnant of the mountain. That's how the high relief in desert areas is reduced.

81. (a)

অ্যাসিড

**Fluvial Erosional Landforms**

- The erosional landforms formed due to running water are Valleys, Potholes & Plunge Pools, Incised or Entrenched Meander and River Terraces.
- The depositional landforms formed due to running water are Alluvial Fans, Deltas, Floodplains, Natural Levees and Point Bars, and Meanders.

**Valleys**

অ্যাসিড

- Valleys start as small and narrow rills; the rills will gradually develop into long and wide gullies; the gullies will further deepen, widen and lengthen to give rise to valleys.
- Depending upon dimensions and shape, many types of valleys like V-shaped valley, gorge, canyon, etc. can be recognized.
- A gorge is a deep valley with very steep to straight sides and a canyon is characterized by steep step-like side slopes.
- Valley types depend upon the type and structure of rocks in which they form. For example, canyons commonly form in horizontal bedded sedimentary rocks and gorges form in hard rocks

**Potholes & Plunge Pools**

অ্যাসিড

- The more or less circular depressions called potholes form over the rocky beds of hillstreams because of stream erosion aided by the abrasion of rock fragments.
- Once a small and shallow depression forms, pebbles and boulders get collected in those depressions and get rotated by flowing water and consequently the depressions grow in dimensions.
- At the foot of waterfalls also, large potholes, quite deep and wide, form because of the sheer impact of water and rotation of boulders. Such large and deep holes at the base of waterfalls are called plunge pools.

**River Terraces**

অ্যাসিড

- River terraces are surfaces marking old valley floor or floodplain levels. They may be bedrock surfaces without any alluvial cover or alluvial terraces consisting of stream deposits.
- River terraces are basically products of erosion as they result due to vertical erosion by the stream into its own depositional floodplain.

82. (d)

অ্যাসিড

- The river terraces may occur at the same elevation on either side of the rivers in which case they are called paired terraces.

- **Statement 1 is incorrect:** The Coriolis force acts perpendicular to the pressure gradient force. Hence, it does not have a role in wind speed. It has a role only in the direction of wind.
- **Statement 2 is incorrect:** It is perpendicular to the isobars (parallel lines connecting the same atmospheric level).
- **Statement 3 is incorrect:** If PGF is high, wind speed will be more.

**Forces Affecting the speed and Direction of Wind**

- The movement of air in the horizontal direction is called wind.
- The wind is under influence of the pressure gradient force (PGF), the frictional force and the Coriolis force.

অ্যাসিড

**Pressure Gradient Force (PGF)**

- It is the rate of change of pressure with respect to distance.
- **It is perpendicular to the isobars (parallel lines connecting the same atmospheric level). Hence, PGF is strong where the isobars are close to each other and it is weak where the isobars are apart.**
- **If PGF is high, wind speed will be more.**

**Coriolis force**

অ্যাসিড

- The rotation of the earth about its axis affects the direction of the wind.
- This force is called the Coriolis force (a pseudo force exerted on a moving object i.e. wind by the rotating non-inertial frame observer).
- It is maximum at the poles and is zero at the equator because it is directly proportional to the angle of latitude.
- **The Coriolis force acts perpendicular to the pressure gradient force. Hence, it does not have a role in wind speed.**
- **It has a role only in the direction of wind.** In doing so, it deflects the wind to the right direction in the northern hemisphere and to the left in the southern hemisphere.

**Frictional force**

অ্যাসিড

- It is due to friction between the features (natural and man-made both) of the Earth and wind.
- It affects the speed of the wind.
- It is greatest at the surface

83. (d)

**Reasons for the Season**

শ্রুতিভঙ্গি

- A season is a period of the year that is distinguished by special climate conditions. The four seasons-spring, summer, fall, and winter-follow one another regularly. Each has its own light, temperature, and weather patterns that repeat yearly.
- **The seasons are caused by the tilt of the Earth's rotational axis away or toward the sun as it travels through its year-long path around the sun.** All the other reasons are there but they have only supplementary effects.
- In June, when the Northern Hemisphere is tilted toward the sun, the sun's rays hit it for a greater part of the day than in winter. This means it gets more hours of daylight. In December, when the Northern Hemisphere is tilted away from the sun, with fewer hours of daylight. This causes the seasons on the Earth.

84. (b)

- **Pair 2 is incorrectly matched:** Cyclonic - Occurs at polar fronts
- **Pair 3 is incorrectly matched:** Orographic - Relief rain

**Types of Precipitation**

শ্রুতিভঙ্গি

- **Conventional Rain:** The, air on being heated, becomes light and rises up in convection currents. As it rises, it expands and loses heat and consequently, condensation takes place and cumulous clouds are formed. With thunder and lightning, **heavy rainfall takes place but this does not last long.** Such rain is common in the summer or in the hotter part of the day. It is very common in the equatorial regions and interior parts of the continents, particularly in the northern hemisphere.
- **Orographic Rain:** When the saturated air mass comes across a mountain, it is forced to ascend and as it rises, it expands; the temperature falls, and the moisture is condensed. The chief characteristic of this sort of rain is that the windward slopes receive greater rainfall. After giving rain on the windward side, when these winds reach the other slope, they descend, and their temperature rises. Then their capacity to take in moisture increases and hence, these leeward slopes remain rainless and dry. The area situated on the leeward side, which gets less rainfall is known as the rain-shadow area. **It is also known as the relief rain.**

- **Cyclonic Rain:** This type of precipitation occurs along the frontal zones of convergence particularly, at the **Inter-Tropical Convergence Zone and at the polar fronts.**

85. (d)

**Mediterranean Type**

শ্রুতিভঙ্গি

- The Warm Temperate Western Margin Climate is found in relatively, few areas in the world. They are entirely confined to the western portion of continental masses, between 30° and 45° north and south of the equator.
- The basic cause of this type of climate is the shifting of the wind belts. Though the area around the Mediterranean Sea has the greatest extent of this type of 'winter rain climate', and gives rise to the more popular name Mediterranean Climate. Other Mediterranean regions include California (around San Francisco), the south-western tip of Africa (around Cape Town), southern Australia (in southern Victoria and around Adelaide, bordering the St. Vincent and Spencer Gulfs), and south-west Australia (Swanland).
- The Mediterranean type of climate is characterized by very distinctive climatic features - a warm summer with off-shore trades, a concentration of rainfall in winter with onshore westerlies, bright, sunny weather with hot dry summers and wet, mild winters and the prominence of local winds around the Mediterranean Sea (Sirocco, Mistral). Since all regions with a Mediterranean climate are near large bodies of water, temperatures are generally moderate with a comparatively small range of temperature between the winter low and summer high. Areas with this climate receive almost all of their yearly rainfall during the winter season, and may go the summer without having any significant precipitation.
- Trees with small broad leaves are widely spaced and never very tall. Though there are many branches they are short and carry few leaves. The absence of shade is a distinct feature of Mediterranean lands. Growth is slow in the cooler and wetter season, even though more rain comes in winter. The warm, bright summers and cool, moist winters enable a wide range of crops to be cultivated. The Mediterranean lands are also known as the world's orchard lands. A wide range of citrus fruits such as oranges, lemons, limes, citrons,

and grapefruit are grown. Wine production is another specialty of the Mediterranean countries, because the best wine is essentially made from grapes. Some 85 percent of grapes produced, go into wine. The long, sunny summer allows the grapes to ripen and then they are handpicked. প্র্যাচিভর্স

- The area is important for fruit cultivation, cereal growing, wine-making and agricultural industries as well as engineering and mining.

86. (d)

- **All pairs are correctly matched.** প্র্যাচিভর্স

**Desert inhabitants**

- The desert inhabitants may be grouped under the following categories:
  - Primitive hunters and collectors (**The Bushmen of Kalahari and The Bindibu of West Australian deserts**),
  - **Nomadic herdsmen (Tuaregs of the Sahara, Mongols of Gobi and the Bedouins of Arabia)**
  - Caravan traders
  - Settled cultivators and
  - Mining settlers.

87. (d)

- **Sea Waves** প্র্যাচিভর্স

- Waves are oscillatory movements that result in the rise and fall of water surface. In fact, the movement of each water particle in a wave is circular.
- The size and force of a sea wave depends on three factors (i) Velocity of the wind, (ii) The length of time the wind blows and (iii) Distance that the wind has travelled across the open sea. This is called a fetch.

88. (b)

- On **21st June**, the northern hemisphere is tilted towards the sun. The rays of the sun fall directly on the **Tropic of Cancer**. As a result, these areas receive more heat. Since a large portion of the northern hemisphere is getting light from the sun, it is summer in the regions north of the equator. The **longest day and the shortest night** at these places occur on **21st June**.
- **Tropic of Capricorn receives direct sunrays during winter solstice (22nd December).** প্র্যাচিভর্স

89. (b)

**Soil type in Jammu & Kashmir** প্র্যাচিভর্স

- Under the existing geo-climatic conditions, a wide range of soils, both of residual and alluvial origins are found in the state.

- The state of Jammu and Kashmir is essentially hilly and mountainous. The outer plain of Jammu with alluvial soils was deposited by running water and the fluvio-glacial action.
- The hilly and mountainous areas are generally covered by the residual soils, while the upper reaches of Chenab and the Jhelum and their tributaries are covered with alluvial and morainic soils. প্র্যাচিভর্স
- The hilly and mountainous soils are found in the entire state excepting the leveled plain of Jammu adjacent to Punjab and the valley floor of Kashmir.
- The Kashmir farmers on the basis of their empirical experience recognize different classes of soils. প্র্যাচিভর্স

**Gruti (Clayey Soil)** প্র্যাচিভর্স

- Gruti soils contain a large proportion of clay.
- Texturally, it resembles to the clayey loam. Its water retaining capacity is high.
- In years of scanty rainfall, it is considered to be the safest for the cultivation of rice.
- Contrary to this, if rains are heavy, the gruti soil gets compacted and achieves the shape of hard cakes; the ploughing of which becomes difficult and pulverization of soil is an arduous task. প্র্যাচিভর্স
- In the years of scanty rainfall, these soils give poor yields. The gruti soils are found in the low-lying areas of the Kashmir Valley.

**Behil (Loamy Soil)**

- Behil is a rich loam of great natural fertility.
- The humus content is high which enriches the soil fertility.
- Consequently, it does not require heavy manuring. প্র্যাচিভর্স
- Moreover, there is always a danger that by over-manuring the soil will be too strong, in which the rice crop will show more vegetative growth and will be more susceptible to lodging.
- It is ideally suited for paddy cultivation.

**Sekil (Sandy Loam)**

- Sekil is a light loam with sandy subsoil.
- In the sekil soil field if artificial irrigation is available, good crops of rice are harvested in the summer season. প্র্যাচিভর্স
- Sekil soil is generally confined to the lower edges of karewas in the Valley of Kashmir.

**Nambal (Peaty Soils)**

- Near the banks of the Jhelum River and in the vicinity of the Wular, Manas bal and Anchar

lakes is found the rich peaty soil, locally known as Nambal.

- In the years of normal rainfall and moderate snowfall, nambal soils give good yields of rapeseed, mustard, maize, oats, pulses and fodder.

90. (c)

শ্রেণীভিত্তিক

- **Both statements are correct**

#### Grasslands

- Grasslands are open regions that are dominated by grass and have a warm, dry climate.
- There are two types of grasslands: tropical grasslands (sometimes called savannas) and temperate grasslands. শ্রেণীভিত্তিক
- Savannas are found closer to the equator and can have a few scattered trees. They cover almost half of the continent of Africa, as well as areas of Australia, India, and South America.
- Temperate grasslands are found further away from the equator, in South Africa, Hungary, Argentina, Uruguay, North America, and Russia. They do not have any trees or shrubs, and receive less precipitation than savannas.
- Prairies and steppes are two types of temperate grasslands; prairies are characterized as having taller grasses, while steppes have shorter grasses. শ্রেণীভিত্তিক
- Grasslands are found where there is not enough regular rainfall to support the growth of a forest, but not so little that a desert forms. In fact, grasslands often lie between forests and deserts. Depending on how they're defined, grasslands account for between 20 and 40 percent of the world's land area. They are generally open and fairly flat, and they exist on every continent except Antarctica, which makes them vulnerable to pressure from human populations. Threats to natural grasslands, as well as the wildlife that live on them, include farming, overgrazing, invasive species, illegal hunting, and climate change. শ্রেণীভিত্তিক
- At the same time, grasslands could help mitigate climate change: One study found California's grasslands and rangelands could store more carbon than forests because they are less susceptible to wildfires and drought. Still, only a small percentage—less than 10 percent—of the world's grassland is protected.

91. (c)

শ্রেণীভিত্তিক

- **Both statements are correct**

#### Saline Soils of India

- India has varied relief features, landforms, climatic realms, and vegetation types. These

have contributed to the development of various types of soils in India. শ্রেণীভিত্তিক

- In ancient times, soils used to be classified into two main groups – Urvara and Usara, which were fertile and sterile, respectively.
  - Saline Soils are also known as Usara soils. Saline soils contain a larger proportion of sodium, potassium, and magnesium, and thus, they are infertile and do not support any vegetative growth. শ্রেণীভিত্তিক
  - They have more salts, largely because of the dry climate and poor drainage. They occur in arid and semi-arid regions and waterlogged and swampy areas.
  - Their structure ranges from sandy to loamy. They lack nitrogen and calcium. Saline soils are more widespread in western Gujarat, deltas of the eastern coast and in Sunderban areas of West Bengal.
  - In the Rann of Kuchchh, the Southwest Monsoon brings salt particles and deposits there as a crust. Seawater intrusions in the deltas promote the occurrence of saline soils.
92. (c)

শ্রেণীভিত্তিক

- **Both statements are correct**

#### El Nino Modoki and Indian Monsoon

- The two important meteorological events as far Indian sub-continent is concerned are monsoons (southwest monsoon and northeast monsoon) and cyclones, which generally form during the pre-monsoon (March-May) and the post-monsoon season (October–December).
- And the two important phenomena which influence the Indian Ocean are the El Nino and Southern Oscillation (popularly known as ENSO) and the recently discovered Indian Ocean Dipole. শ্রেণীভিত্তিক
- El Nino can further be classified into two types— traditional El Nino which is characterized by strong anomalous warming in the eastern equatorial Pacific and the El Nino Modoki that is associated with strong anomalous warming in the central tropical Pacific and cooling in the eastern and western tropical Pacific.
- If El Nino over the Pacific Ocean increases in intensity this year, monsoon onset over Kerala would be severely impacted and El Nino and Indian Ocean Dipole events will be important factors. শ্রেণীভিত্তিক
- **It has been noticed that the frequency of tropical cyclones are more over Arabian Sea**

and less over Bay of Bengal during the El Nino Modoki years as compared to El-Nino Years.

প্র্যাচিভর্স

- **La Nina Modoki is the counter part of El Nino Modoki and is characterized by colder central Pacific being flanked by warmer eastern and western Pacific.**
- Over Bay of Bengal, there is a reduction in the magnitude of low level convergence, during La-Niña Modoki years compared to the canonical La-Niña years; this suppresses the formation of severe cyclonic storm.

93. (c)

- **Both statements are correct**

প্র্যাচিভর্স

**Seasonal Rhythms in India**

- **Cold Weather Season**
  - During this season sun is over the tropic of Capricorn and is characterized by high-pressure conditions over the north Indian plains.
  - The northern parts of the country have a mean temperature below 21°C and January is the coldest month.
  - The most important weather condition of this season is the western disturbance which provides rainfall and snowfall to northern parts of the country.
- **On reaching the Indian subcontinent these are obstructed by the Himalayas and are responsible for orographic rainfall or frontal rainfall in northern parts of India including states of J&K, Himachal, Punjab, Haryana, Delhi, Uttarakhand, Uttar Pradesh, etc.**
- The amount of rainfall decreases from the west towards the east and from the north towards the south.
- **Hot Weather Season**
  - This season is characterized by high temperature and low humidity.
  - **The northern and central parts of India experience heat waves and are characterized by low pressure which attracts moisture-laden winds from the Arabian Sea and the Bay of Bengal towards the Indian sub-continent on a local or regional scale.**
  - These winds cause some precipitation and are called pre-monsoonal showers which are named differently in different parts of India.

প্র্যাচিভর্স

প্র্যাচিভর্স

94. (b)

- **Option (b) is correct**

**Formation of the North-East Monsoon**

- The north-east monsoon, commonly known as winter monsoon blows from land to sea.
- As the Sun moves southwards due to which, the following phenomena occur.
  - **ITCZ moves southward.**
  - **Formation of the High-Pressure belt over Tibet due to cooling of the Plateau. This leads to the end of the Somali Jet and Tropical Easterly Jet stream.**
  - **Subtropical Jetstream returns back in its original position i.e. over Indian Peninsula, south of the Himalayas.**
  - **The Walker Cell, which was formed and strong in summer, gets weakened.**
- All these factors aid the movement of the North-East Trade wind and cold air mass from the Siberia and Tibet into India and the Bay of Bengal. This is called North-East Monsoon (due to reversal of wind).
- This cold and moisture-free wind when blows over the Bay of Bengal, its humidity increases and thus the rainfall over Tamil Nadu.

প্র্যাচিভর্স

প্র্যাচিভর্স

95. (d)

**Factors Affecting Indian Monsoon**

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- **Jet Stream Theory**
  - This theory tries to explain the establishment of both the NE and SW Monsoons as well their unique features like bursting and variability. The jet streams are a system of upper-air westerlies. It gives rise to slowly moving upper-air waves, with 250 knots winds in some air streams.
  - Over India, a subtropical westerly jet develops in the winter season which is replaced by the tropical easterly jet in the summer season. The high temperature over the Tibetan Plateau, as well as over Central Asia in general, during the summer is believed to be the critical factor leading to the formation of the tropical easterly jet over India in summer. The mechanism affecting monsoon is that the westerly jet causes high pressure over northern parts of the subcontinent during the winter. This results in the north to south flow of the winds in the form of the NE Monsoon. With the northwards shift of the vertical sun, this jet shifts northwards too. The

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intense heat over the Tibetan Plateau, coupled with associated terrain features of high altitude of the plateau, etc. generate the tropical easterly jet over Central India. This jet creates a low pressure zone over the northern Indian plains influencing the wind flow towards these plains, assisting the establishment of the SW Monsoon.

- **Somali current and Somali jet stream**
  - During June-July-August due to creation of high pressure at Mascarene high basin, air diverges due to which it goes towards horn of Africa. Here it is divided into two parts - one goes towards Africa and another goes towards Indian subcontinent.
  - It is a low level jet stream (appear only in summer) ଓସ୍ତ୍ରାଲିଭର୍ଷ
  - **Its occurrence predicts good monsoon in India.**
  - Somali jet Stream is a low level jet stream which flows from Somalia to Indian mainland. ଓସ୍ତ୍ରାଲିଭର୍ଷ

96. (b)

- **Statement 1 is incorrect:** If both ENSO and the PDO are in the same phase, it is believed that El Niño/La Nina impacts may be magnified.
- **Statement 2 is correct:** During El Niño, Walker Circulation is weakened and shifted eastward owing to reduced east-west sea surface temperature gradient across the Pacific Ocean. ଓସ୍ତ୍ରାଲିଭର୍ଷ

#### Pacific Decadal Oscillations (PDO)

- PDO is a long-term ocean fluctuation of the Pacific Ocean, which waxes and wanes approximately every 20 to 30 years.
- Just like El Nino/La Nina in the tropical Pacific, PDO has a signature for a longer time (on the decadal scale) in the sea surface temperatures and its interaction with the atmosphere, which in turn affects the northeast Indian summer monsoon.
- PDO can intensify or diminish the impacts of ENSO according to its phase. **If both ENSO and the PDO are in the same phase, it is believed that El Niño/ La Nina impacts may be magnified.** Conversely, if ENSO and the PDO are out of phase, it has been proposed that they may offset one another, preventing “true” ENSO impacts from occurring.

#### Walker Circulation ଓସ୍ତ୍ରାଲିଭର୍ଷ

- The Walker Circulation refers to an eastwest circulation of the atmosphere above the tropical

Pacific, with air rising above warmer ocean regions (normally in the west), and descending over the cooler ocean areas (normally in the east). Its strength fluctuates with that of the Southern Oscillation. The characteristics of the Walker Circulation were largely determined by the coupling between the tropical atmosphere and oceans. Walker Circulation is closely tied to that of the Southern Oscillation and El Niño. During an El Niño, the weakening Walker Circulation causes widespread drought in Indonesia/maritime continent, drought in north eastern Brazil, severe floods in Peru and Ecuador, and in southeastern Brazil and northern Argentina. During a La Niña, the Walker Circulation intensifies and leads to rainfall anomalies with reverse sign compared to El Niño.

- **During El Niño, Walker Circulation is weakened and shifted eastward owing to reduced east-west sea surface temperature gradient across the Pacific Ocean.** This suppresses broadscale convection over the western Pacific and eastern Indian Ocean and leads to weaker South Asian monsoon.

97. (a)

#### Factors Determining the Climate of India ଓସ୍ତ୍ରାଲିଭର୍ଷ

- India's climate is controlled by a number of factors which are as following:
  - Latitudinal location
  - Distance from the Sea
  - The Himalayas
  - Physiography
  - Monsoon Winds
  - Upper Air Circulation
  - El Nino and La Nina ଓସ୍ତ୍ରାଲିଭର୍ଷ
  - Tropical Cyclones and Western Disturbances
  - The Tropic of Cancer passes through the central part of India in east-west direction. Thus, northern part of the India lies in sub-tropical and temperate zone and the part lying south of the Tropic of Cancer falls in the tropical zone. The tropical zone being nearer to the equator, experiences high temperatures throughout the year with small daily and annual range. Area north of the Tropic of Cancer being away from the equator, experiences extreme climate with high daily and annual range of temperature. ଓସ୍ତ୍ରାଲିଭର୍ଷ
- **The Himalayan Mountains:** The towering mountain chain provides an invincible shield to protect the subcontinent from the cold northern winds.

- **Rivers do not determine the climate of India.**

98. (c)

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- **R is incorrect:** Arabian Sea branch is roughly three times stronger than the Bay of Bengal branch.

#### Division of Southwest Monsoon

- The southwest monsoon arrives in two branches: the Bay of Bengal branch and the Arabian Sea branch. The latter extends toward a low-pressure area over the Thar Desert, **measuring roughly three times stronger than the Bay of Bengal branch.**
- The Arabian Sea branch and Bay of Bengal branch are the two branches of south-west monsoon in India.
- The Arabian Sea branch of the monsoon causes rainfall in the Western Ghat, Mumbai, Gujarat and Central India.
- The Bay of Bengal branch of the monsoon causes rainfall in North-East India and the Ganga Plain.
- The two branches merge with each other mostly around Delhi to form a single current. Both the branches reach Delhi more or less at the same time.
- The combined current gradually extends to west Uttar Pradesh, Haryana, Punjab, Rajasthan and finally to Himachal Pradesh and Kashmir.
- Arabian Sea branch of the monsoon is much powerful than the Bay of Bengal branch for two reasons:

99. (d)

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#### Climatic Regions of India according to Koeppen's Scheme

- The whole of India has a monsoon type of climate. But the combination of elements of the weather, however, reveals many regional variations. These variations represent the

subtypes of the monsoon climate. It is on this basis that the climatic regions can be identified.

- **Tropical savannah (Aw)** is found in most of the peninsular plateaus, south of the Tropic of Cancer.
- **Steppe climate (BShw)** is found in North western Gujarat, some parts of western Rajasthan and Punjab.
- Polar type (E) is found in Jammu and Kashmir, Himachal Pradesh and Uttarakhand.

100. (b)

- **Pair 3 is incorrectly matched:** Red and Yellow Soil is found in the in the eastern and southern part of the Deccan Plateau and are also found in parts of Odisha and Chhattisgarh and in the southern parts of the middle Ganga plain.

#### Types of Soil and their areas

প্র্যাচিভর্স

- The laterite soils are commonly found in Karnataka, Kerala, Tamil Nadu, Madhya Pradesh and the hilly areas of Odisha and Assam.
- Black soil covers most of the Deccan Plateau which includes parts of Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh and some parts of Tamil Nadu. In the upper reaches of the Godavari and the Krishna, and the north western part of the Deccan Plateau, the black soil is very deep.
- **Red and Yellow Soil is found in the in the eastern and southern part of the Deccan Plateau and are also found in parts of Odisha and Chhattisgarh and in the southern parts of the middle Ganga plain.**
- Alluvial Soil are depositional soils, transported and deposited by rivers and streams. Through a narrow corridor in Rajasthan, they extend into the plains of Gujarat. In the Peninsular region, they are found in deltas of the east coast and in the river valleys.