

UNIT I: INTRODUCTION TO CULTURE

1. Define culture. What is the importance of culture?

"Culture is everything which is socially shared and learned by the members of a society."

Tylor defined "It is that complex whole including beliefs, art, religion, values, norms, ideas, law, taught,

knowledge, custom and other capabilities acquired by a man as a member of a society."

It is the totality of human experience acquired during transmission of heritage from one generation to

another and to learn the ways of learning, eating, drinking, behaving, walking, dressing, and working is

the culture of man.

Culture is important to us because it defines our evolutionary identity. Culture helps us understand our ancestral values and gives us the very meaning of life. It also makes us unique from other parts of the world.

1. What are the elements of culture?

Language, symbols, values, and norms are among the important elements of culture. Language in its different forms like reading, writing and speaking makes it possible for the present generation to understand the achievements of earlier generations. But language itself is a part of culture. Our religious beliefs, customs and traditions, art, as also history, taken together can be considered as the cultural elements.

2. What is Civilization?

A civilization is a human society with its own social organization and culture. A human society that has highly developed material and spiritual resources and a complex cultural, political, and legal organization; an advanced state in social development the total culture of a particular people, nation, period, etc. The condition of being civilized; social organization of a high order, marked by the development and use of a written language and by advances in the arts and sciences, government, etc. Civilization is a building block of Human Societies which is improving the quality of life. Examples: Indus valley civilization, Mesopotamia, ancient Egypt, and Roman civilization.

3. Explain the relationship between culture and heritage?

Culture and Heritage Cultural development is a historical process. Our ancestors learnt many things from their predecessors. With the passage of time they also added to it from their own experience and gave up those which they did not consider useful. We in turn have learnt many things from our ancestors. As time goes we continue to add new thoughts, new ideas to those already existent and sometimes we give up some which we don't consider useful any more. This is how culture is transmitted and carried forward from generation to next generation. The culture we inherit from our predecessors is called our cultural heritage. This heritage exists at various levels. Humanity as a whole has inherited a culture which may be called human heritage. A nation also inherits a culture which may be termed as national cultural heritage. Cultural heritage includes all those aspects or values of culture transmitted to human beings by their ancestors from generation to generation. They are cherished, protected and maintained by them with unbroken continuity and they feel proud of it. A few examples heritage are - The Taj Mahal, Jain caves at Khandagiri and Udayagiri, Bhubaneswar, Sun Temple Konarak, Jagannath Temple,

Puri, Lingaraja Temple, Bhubaneswar, Red Fort of Agra, Delhi's Qutub Minar, Mysore Palace, Jain Temple of Dilwara (Rajasthan) Nizamuddin Aulia's Dargah, Golden Temple of Amritsar, Gurudwara Sisganj of Delhi, 5 Sanchi Stupa, Christian Church in Goa, India Gate etc., are all important places of our heritage and are to be protected by all means.

Besides the architectural creations, monuments, material artefacts, the intellectual achievements,

philosophy, treasures of knowledge, scientific inventions and discoveries are also the part of heritage. In

Indian context the contributions of Baudhayana, Aryabhatta, Bhaskaracharya in the field of Mathematics, Astronomy and Astrology; Varahmihir in the field of Physics; Nagarjuna in the field of

Chemistry, Susruta and Charak in the field of Medicines and Patanjali in the field of Yoga are profound

treasures of Indian Cultural heritage. Culture is liable to change, but our heritage does not.

4. What are General Characteristics of Culture?

Culture is the Centre of a society and without culture no society can even exist. It is the main difference between human beings and animals. Culture refers to the pattern of human activity and the symbols that give significance to them. Culture manifests itself in the forms of art, literature, clothing, customs, language, and religion. The way people live and what they believe constitutes their culture.

1. **Culture is learned and acquired:** Culture is acquired in the sense that there are certain behaviours which are acquired through heredity. Individuals inherit certain qualities from their parents but socio-cultural patterns are not inherited. These are learnt from family members, from the group and the society in which they live. It is thus apparent that the culture of human beings is influenced by the physical and social environment through which they operate.

2. **Culture is shared by a group of people:** A thought or action may be called culture if it is shared and believed or practiced by a group of people.

3. **Culture is cumulative:** Different knowledge embodied in culture can be passed from one generation to another generation. More and more knowledge is added in the particular culture as the time passes by. Each may work out solution to problems in life that passes from one generation to another. This cycle remains as the particular culture goes with time.

4. **Culture changes:** There is knowledge, thoughts or traditions that are lost as new cultural traits are added. There are possibilities of cultural changes within the particular culture as time passes. Migration and globalization lead to a mixing of cultures. When people from different parts of the world come together, they influence each other and effectively, each other's cultures

5. **Culture is dynamic:** No culture remains on the permanent state. Culture is changing constantly as new ideas and new techniques are added as time passes modifying or changing the old ways. This is the characteristics of culture that stems from the culture's cumulative quality.

6. **Culture gives us a range of permissible behaviour patterns:** It involves how an activity should be conducted, how an individual should act appropriately.

7. **Culture is diverse:** It is a system that has several mutually interdependent parts. Although these parts are separate, they are interdependent with one another forming culture as whole.

8. **Culture is ideational:** Often it lays down an ideal pattern of behaviour that are expected to be followed by individuals so as to gain social acceptance from the people with the same culture.

5. Write in detail about Uniqueness of Indian Culture?

The culture of India refers collectively to the thousands of distinct and unique cultures of all religions and communities present in India. India's languages, religions, dance, music, architecture, food and customs differ from place to place within the country. Many elements of India's diverse cultures, such as Indian religions, philosophy, cuisine, languages, dance, music and movies have a profound impact across the world. Features of Indian culture are:

Continuity and Change Many great cultures had developed in different countries and regions of the world. Many of them have perished or have been replaced by other cultures. However Indian culture has had an enduring character. Despite major changes and upheavals significant threads of continuity can be traced throughout the course of Indian history right upto the present day.

Variety and Unity Indian culture, over the last three millennia, has successfully, observe the best assimilable parts from other religions and cultures, from time to time and integrated them into itself.

Secular Outlook

The secular character of Indian culture is a result of the intermingling of people belonging to diverse cultural groups over a long period of time. There have been instances of occasional conflicts here and there, but by and large, people have lived together peacefully for centuries. The popular cultural traditions of India are the best examples of such cultural synthesis in which a large number of people belonging to different religious groups come together.

Universalism The concept of coexistence has not been confined to the geographical and political boundaries of the country only. India has a universal outlook and it has been promoting the message of peace and harmony to the entire world. India has been raising a strong voice against racialism and colonialism. It has protested against the formation of power blocks in the world. In fact India became one of the founder members of the non-aligned movement.

Materialistic and Spiritualistic Culture is spiritual development of a race or nation in the field of mind, interests, conduct, thought, art, skills and civilization. India is popularly known to be a land of spirituality particularly to the West. However, Indian history from ancient times to present day shows that the developments of materialistic and non-materialistic culture have been going on alongside. Scientific and mathematical achievements in ancient times have been remarkable. There was no opposition or resistance by religious or other thoughts in pursuing such knowledge

Due to its adaptability and comprehensiveness, Indian culture has survived through the ages. Unity in diversity is one of the major characteristics of Indian culture which makes it unique. A synthesis of various cultures came about through the ages to give shape to what is recognised as Indian culture today. Spirituality and value based life style is the core of Indian culture but it has scientific temperament too. The composite and dynamic character of Indian culture is a result of the rich contributions of all these diverse cultural groups over a long period of time. The distinctive features of Indian culture and its uniqueness are the precious possession of all Indians.

6. What is the importance of culture in human literature?

Culture is closely linked with life. It is not an add-on, an ornament that we as human beings can

use. It is not merely a touch of colour. It is what makes us human. Without culture, there would be no humans. Culture is made up of traditions, beliefs, way of life, from the most spiritual to the most material. It gives us meaning, a way of leading our lives. Human beings are creators of culture and, at the same time, culture is what makes us human. A fundamental element of culture is the issue of religious belief and its symbolic expression. We must value religious identity and be aware of current efforts to make progress in terms of interfaith dialogue, which is actually an intercultural dialogue. As the world is becoming more and more global and we coexist on a more global level we can't just think there's only one right way of living or that any one is valid. The need for coexistence makes the coexistence of cultures and beliefs necessary. In order to not make such mistakes, the best thing we can do is get to know other cultures, while also getting to know our own. How can we dialogue with other cultures, if we don't really know what our own culture is? The three eternal and universal values of Truth, Beauty and Goodness are closely linked with culture. It is culture that brings us closer to truth through philosophy and religion; it brings beauty in our lives through the Arts and makes us aesthetic beings; and it is culture that makes us ethical beings by bringing us closer to other human beings and teaching us the values of love, tolerance and peace

7. Write about ancient India?

India has a continuous history covering a very long period dating as far back as 7000 BC; Which is dynamic, spanning back to the beginning of human civilization. It begins with a mysterious culture along the Indus River and in farming communities in the southern lands of India. It begins with the birth of the Indus Valley Civilization, more precisely known as Harappan Civilization.

- The Harappans built the earliest cities complete with town planning, sanitation, drainage system and broad well-laid roads;
- Agriculture was the most important occupation of the rural people.
- The vedic people have contributed immensely in various fields such as literature, religion and philosophy;
- Towards the latter Vedic people society was divided into four varnas Brahmanas, Kshatriyas, Vaishyas and Shudras.
- Important religions i.e. Hinduism, Jainism and Buddhism evolved and interactions between them resulted in a synthesis in Indian culture.
- The early Vedic people worshipped forces of nature and personified them as Gods and goddesses.
- The Mauryans set up the first great empire in North India and under the rule of Ashok the Great it reached great height in many fields;
- The Mauryan contribution towards art and architecture was significant.
- Temple architecture reached its pinnacle of glory under the Pallavas who were great builders.
- Examples of the Gupta art can be seen at the Dashavtara temple at Deogarh and the cave temples in Udaigiri temples.
- King Harsha came to the throne of Thaneswar after he had lost his family in tragic circumstances. Two persons have given detailed accounts of Harsha's reign. One is Hiuen Tsang—a Chinese pilgrim; the other is Bana Bhat—his court poet.
- Harsha was an efficient and benevolent ruler. He indulged in many welfare activities. He gave endowments for great public servants, rewarded people who did work of a

high intellectual calibre and encouraged religious activities by giving gifts to various sects. He built many hospitals and rest houses. Nalanda became a great centre of learning during Harsha's reign. Harsha was also a literary person. He himself wrote plays and collected learned men around him.

- The achievements of the Cholas also lie in their conquests across the seas and developing democratic institutions for governance at the village level.

8. What do you know about Medieval India?

Medieval India refers to a long period of the Indian subcontinent's history between "ancient India" and "modern India". During this long time period, different dynasties rose in power and took a commanding role in the history of medieval India. The land of India was separated as various small kingdoms from north to south and east to west and those kingdoms were ruled by different independent kings.

The early Turkish rulers (1206-1526) were called Sultans, as they were supposed to rule on behalf of the Caliphs.

- The Mughals replaced the Sultans of Delhi. They patronised music, painting and architecture and they ruled India till 1707. They also built a large number of buildings. The Mughal empire weakened and disintegrated after 1707. In this chaos, emerged the British East India Company, as a political power.
- The Sufis with their attitude of piety, tolerance, sympathy, and concept of equality had deep impact on the Indian people.
- The Bhakti movement of fourteenth and sixteenth centuries developed into two streams; nirguna and saguna.
- The people developed their own regional and local folk traditions of dance and music.
- The medieval period saw the emergence of Urdu. This period saw the rise of the present-day Marathi, Tamil, Telugu, Kannada and Malayalam in the south and Assamese, Bengali, Hindi or Khari-boli, Punjabi and Gujarati languages in the north.
- Sikhism was founded by Guru Nanak. Guru Arjun Dev finalised the present script of Gurmukhi, the Adi-Granth and the site of Har-Mandir in Amritsar.
- Zoroastrianism was founded by Zoroaster in eighth century BC in Persia.
- The Cholas conquered parts of Bengal and Indonesia. They introduced democratic institutions at the village level.
- Kanchi became a great seat of learning.
- Vijayanagara's remains have been found at Hampi in Karnataka. In the Andhra region, flourished the Bahmani state.
- The Indian society at this time was divided into four major groups - the aristocrats, the priests, the town people and the peasants.
- Trade flourished in Delhi as the centre of all incoming as well as outgoing trade.
- Islam had a great influence on the Indian society. There were two important religious movements during this period – The Sufi and the Bhakti movements.
- The most important Sufi saints were Chishti, Firdausi, and Nizam-ud-din Auliya.
- Some well known Bhakti saints were Guru Nanak, Ramanuja, Ramananda, Kabir, Chaitanya, Mirabai and Namadeva.

9. Write few lines about the influence of The English in Modern India?

During 19th century, a series of reform movements swept across India. These movements tried to address issues related to condition of women, caste rigidities, evils that had crept in religious beliefs of people, modernization of communities, educational backwardness etc. British policy makers also tried to popularize English education in India. This could be the medium for the import of European culture and morality. This would eventually help them strengthen their control over this country. During this period, both the English as well as the Indian language press flourished. However, restrictions were imposed at different times to curtail the freedom of press. Social changes that occurred during the modern period helped to prepare the country ultimately for a national liberation movement against the British. The events like invention of the printing press, the Renaissance and Reformation in Europe led to the spread of learning, which encouraged people to question dogmas.

- India's contact with the West had positive effects, as this led to a number of religious and social reforms that challenged social evils such as the sati system, child marriage, denial of widow remarriage, illiteracy, female infanticide and the caste system.
- The followers of Swami Dayanand, a great Vedic scholar, founded the Arya Samaj in 1875 and fought against untouchability, polytheism, and idolatry and pleaded for equal status for women.
- The invention of lithography in 1798 was a milestone as it helped the Indians to set up printing presses in many cities and start newspapers and journals. It also led to a tremendous growth of the modern Indian languages.

UNIT II: INDIAN LANGUAGES, CULTURE AND LITERATURE

1. Define Literature?

Literature is a term used to describe written and sometimes spoken material. Derived from the Latin word *literature* meaning "writing formed with letters," literature most commonly refers to works of the creative imagination, including poetry, drama, fiction, nonfiction, and in some instances, journalism, and song. Literature may be classified according to a variety of systems, including language, national origin, historical period, genre, and subject matter.

2. What is the significance of scriptures to current society?

"We are at an age of 'videoacy' rather than 'literacy,'" Haney said. "It doesn't matter how they deliver their messages, people need different channels to express themselves. You can look at film as an alternative form of literature." But not exactly literature

Long before language was invented, stories were told and engraved upon stone tablets and walls carvings. Long before human began to know how to read and write with the words that our ancestors created, literature already existed. Literature is the foundation of humanity's cultures, beliefs and traditions. **It serves as a reflection of reality, a product of art, and a window to an ideology.**

William Shakespeare, "Henry VI": "I'll call for pen and ink and write my mind."

"By reading narratives, we can empathise and understand others," said **Judith Caesar**

"To me the purpose of life is to grow. Grow and become better people, better listeners and to connect better with those around us. No other field can teach us this better than literature." **S.**

Farooqui

- Literature has had a major impact on the development of society. It has shaped civilisations, changed political systems and exposed injustice. Literature gives us a detailed preview of human experiences, allowing us to connect on basic levels of desire and emotion.
- Literature is thought provoking; it allows us to raise questions and gives us a deeper understanding of issues and situations. literature's role in allowing its readers to grasp the meaning of human conflict.

- "In an era of modern media, such as television and movies, people are misled into thinking that every question or problem has its quick answer or solution, However, literature confirms the real complexity of human experience." Which recognised literature's role in influencing human thought.
- "Literature is the study of human nature. We see human nature through tragedy and romance, joy and sorrow, in epiphanies and denial, in moments of heroism and in moments of cowardice," said Sa'ad Farooqi,
- "Literature teaches us to analyse a character, allows us to reach inside his or her mind so we see what drives a character, what shapes his or her beliefs and how one relates to others."
- Literature is also a tool for the foundation of religion. *The Holy Bible*, one of the oldest written scriptures, is compilation of tales, beliefs, and accounts that teach about Christianity. Within a span of more than a thousand years from the Prophet Moses to the Apostle Paul, Bible was written by numerous authors believed to be inspired by God's divine wisdom and tried to explain about the mysteries of life as well as setting rules for one's personal faith. The same goes with all other religions

Literature works to expand our minds and give us a greater understanding of the world."When confronted with such works, we automatically question our beliefs, values, morality and the infinite,". It speaks to us, it is universal, and examine our lives, giving them deeper meaning, and it affects us on a deeply personal level. It make us realise the true depth of human emotion and behaviour. There is more to a person than what they display on the exterior. They see the intricacy of human experience, giving them an open mind and an open heart. However, today's youth can only reach this point of enlightenment through seeking knowledge - by being well read and cultured individuals.

4. What is the role of Sanskrit?

Ever since human beings have invented scripts, writing has reflected the culture, lifestyle, society and the polity of contemporary society. In the process, each culture evolved its own language and created a huge literary base. This literary base of a civilization tells us about the evolution of each of its languages and culture through the span of centuries. Sanskrit is the mother of many Indian languages. The Vedas, Upanishads, Puranas and Dharmasutras are all written in Sanskrit. There is also a variety of secular and regional literature. By reading about the languages and literature created in the past, we shall be able to understand our civilization better and appreciate the diversity and richness of our culture. All this was possible because of the language that developed during that time. Sanskrit is the most ancient language of our country. It is one of the twenty-two languages listed in the Indian Constitution .The literature in Sanskrit is vast, beginning with the most ancient thought embodied in the Rig Veda, the oldest literary heritage of mankind, and the Zend Avesta. It was Sanskrit that gave impetus to the study of linguistics scientifically during the eighteenth century. The great grammarian Panini, analysed Sanskrit and its word formation in his unrivalled descriptive grammar Ashtadhyayi.

The Buddhist Sanskrit literature includes the rich literature of the Mahayana school and the Hinayana school also. The most important work of the Hinayana school is the Mahavastu which is a storehouse of stories. While the Lalitavistara is the most sacred Mahayana text which supplied literary material for the Buddhacarita of Asvaghosa. Sanskrit is perhaps the only

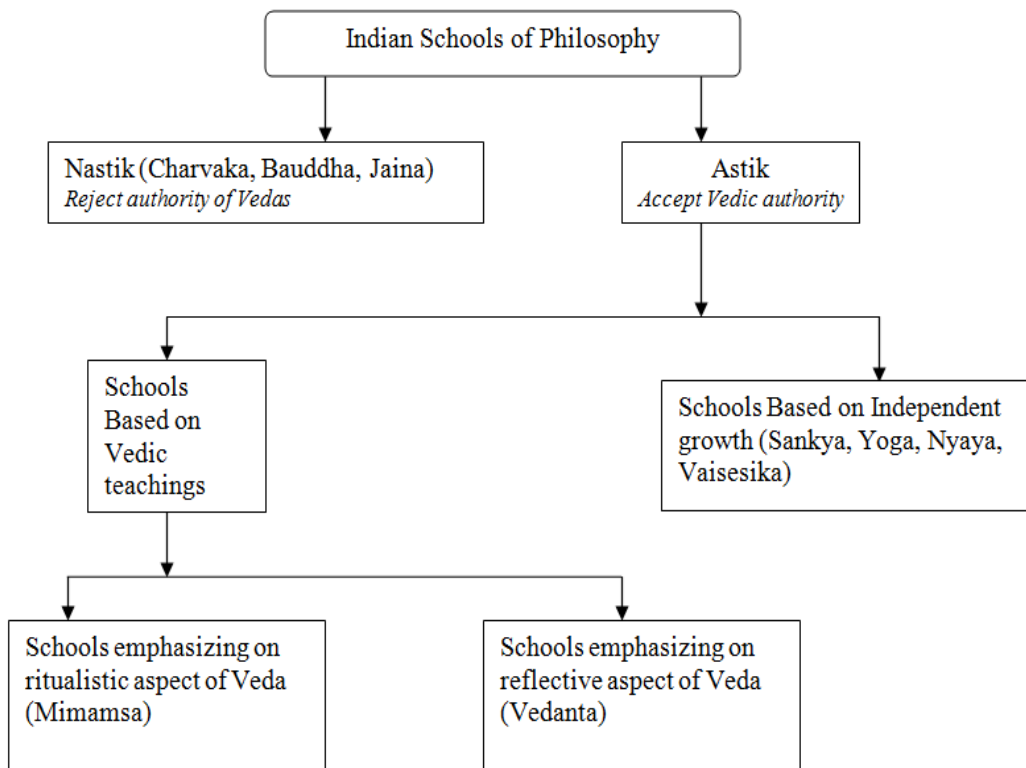
language that transcended the barriers of regions and boundaries. From the north to the south and the east to the west there is no part of India that has not contributed to or been affected by this language. Kalhan's Rajatarangini gives a detailed account of the kings of Kashmir whereas with Jonaraja we share the glory of Prithviraj. The writings of Kalidasa have added beauty to the storehouse of Sanskrit writings. Other great literary works, which marked the golden era of Indian literature include 'Abhijanam Shakuntalam' and 'Meghdoot' by Kalidasa, 'Mricchakatika' by Shudraka, 'Swapna Vasavadattam' by Bhasa, and 'Ratnavali' by Sri Harsha. Some other famous works are Chanakya's 'Arthashastra' and Vatsyayana's "Kamasutra'.

5. Give a detailed description of Indian Philosophy with help of the orthodox and heterodox schools ?

Indian Philosophy (or, in Sanskrit, Darshanas), refers to any of several traditions of philosophical thought that originated in the Indian subcontinent, including Hindu philosophy, Buddhist philosophy, and Jain . It is considered by Indian thinkers to be a practical discipline, and its goal should always be to improve human life.

The Indian philosophy is categorized into six Orthodox and three Heterodox philosophies. The classification is based on the acceptance of the authority of the Vedas. The Orthodox school of philosophy also called the Aastika school believes in the authority of Vedas, while the Heterodox school of philosophy, popularly known as Nastika school rejects the principle of authority of Vedas.

The six orthodox schools are called as shatdarshanas and include Nyaya, Sankhya, Yoga, Vaisheshika, Purva Mimamsa and Uttara Mimamsa (Vedanta Philosophy). Most of these schools of thought believe in the theory of Karma and rebirth. Moksha (salvation) is believed to be the liberation from the cycle of birth and death and is the ultimate goal of human life.



Nyaya Philosophy : Nyaya school follows a scientific and a rational approach. Sage Gautama is the founder of this school. It's banks upon various pramanas (mechanism of attaining knowledge). It believes that gaining knowledge through the five senses is the sole way of attaining liberation from the cycle of birth and death.

Sankhya Philosophy: Sankhya is the oldest of all philosophies put forth by the sage Kapila. It is a dualistic philosophy with Purusha (soul) and Prakriti (nature) in it. Advaita Vedanta derives its base from Sankhya School. Sankhya also devolves philosophical basis for Yoga. It emphasizes the attainment of knowledge of self through meditation and concentration.

Yoga Philosophy: Yoga school introduces the methods of the discipline of body and mind. Sage Patanjali is the founder of Yoga. Emancipation of Purusha from Prakriti by self-awareness through the discipline of body and mind is conceptualized by Yoga. It is believed that practising Ashtanga Yoga is the way to relieve oneself from past sins in order to make way for liberation.
Vaisheshika: school deals with metaphysics. It was founded by the sage Kanada. It is an objective and realistic philosophy of the Universe. According to the Vaisheshika school of philosophy, the universe is reducible to a finite number of atoms, Brahman being the fundamental force causing consciousness in these atoms.

Purva Mimamsa : school believes in the complete authority of Vedas . It is based on sage Jaimini's Mimamsa Sutras. It emphasizes the power of yajnas and mantras in sustaining the activities of the universe. It states that a human being can attain salvation only by acting in conformity with the principles of Vedas.

Uttara Mimamsa (Vedanta) Vedanta school is a monoistic school of philosophy that believes that the world is unreal and the only reality is Brahman. The three sub branches of Vedanta are Advaita of Shankaracharya, Vishishta Advaita of Ramanujacharya and Dvaita of Madhwacharya. Uttara Mimamsa is based on Upanishads (the end portions of Vedas).

HETERODOX (NON-HINDU) SCHOOLS

The main heterodox (nastika) schools, which do not accept the authority of the Vedas, include:

It is a system of beliefs based on the teachings of Siddhartha Gautma. **Buddhism** is a non-theistic philosophy whose tenets are not especially concerned with the existence or non-existence of God. Four Noble Truths in Buddhism are the following.

1. There is suffering
2. There is a cause of suffering
3. There is a cessation of suffering
4. There is a way to the cessation of suffering

Buddhists philosophy of life to get 'Nirvana' from suffering is based on the following eight principles:

1. Right Faith (Samyak Dristi)
2. Right Resolve (Samyak Sankalpa)
3. Right Speech (Samyak Vakya)
4. Right Action (Samyak Karmanta)

5. Right Living (Samyak Ajiva)
6. Right Thought (Samyak Smriti)
7. Right concentration (Samyak Samadhi)
8. Right Effort (Samyak Vyayama)

Jain Philosophy: Already in existence by 6th century B.C, it was revived by Mahavira, the 24th Jain Tirthankara. According to Jainism, Nirvana or liberation is obtained through three jewels: Right Philosophy, Right Knowledge and Right Conduct (Tri-ratna). Right conduct implies 5 abstinences: not to lie, not to steal, not to strive for luxury and not to strive for possessions, not to be unchaste and not to injure (Ahimsa).

Ajivika Philosophy: A related philosophy which some classify under the heterodox system is Ajivika Philosophy. The Ājīvikas may simply have been a more loosely-organized group of wandering ascetics (shramanas or sannyasins). Some of its prominent figures were Makkhali Gosala and Sanjaya Belatthaputta. This was an ascetic movement of the Mahajanapada period in the Indian subcontinent.

6. Write about the developments of North Indian Languages and Literature?

Languages evolved in India right upto the early medieval period. These were evolving at two levels: the spoken and the written language. The studies have indicated that all the scripts of present northern Indian languages, except that of Urdu, have had their origin in old Brahmi. A long and slow process had given them this shape. If we compare the scripts of Gujarati, Hindi and Punjabi, we can easily understand this change. As for the spoken word, there are over 200 languages or dialects spoken in India at present, only twenty-two have found their way into our Constitution.

- Hindi was spoken by a large number of people.
- Urdu and Persian became popular in the Mughal era. Urdu was born out of the interaction between Turkish settlers and the local people. Abul Fazl, Chandra Bhan and Badayuni were famous writers of the Mughal era.
- Hindi literature looked to Sanskrit classics for guidance. Bhakti poetry is a milestone in Hindi literature. Kabir, Tulsidas and Surdas were the guiding light of Hindi literature. In the beginning of the nineteenth century Hindi prose came into existence.
- Next to Hindi, the richest literature is that of Bengali. Rabindranath Tagore, Bankim Chandra Chatterji and Sharat Chandra Chatterji contributed to the making of Bengali literature. Assamese literature consisted of buranjis. Similar is the case with Oriya.
- Till the end of the nineteenth century, Gurmukhi was limited to Adi Granth; it was the love stories of Heer Ranjha which gave this language a theme. The devotional song of Meera Bai gave a place of honour to Rajasthani language and literature.
- Gujarati, Sindhi, Marathi and Kashmiri also developed their literature in due course of time.
- Many Indian writers composed their writings in English.

7. Discuss the Development of Literature during the Mughal Period?

Urdu emerged as an independent language towards the end of the 4th century AD. Arabic and Persian were introduced in India with the coming of the Turks and the Mongols. Persian remained the court language for many centuries. Urdu as a language was born out of the interaction between Hindi and Persian

There was a tremendous development in the field of literature during the Mughal times. Babar and Humayun were lovers of literature. Baber was himself a great scholar of Persian. He wrote a book known as Tuzek-e-Babari which is highly esteemed by the Turkish Literature. Humayun got the treatise translated into Arabic. He too was a lover of learning and had established a big Library. Humayun Nama, tops the books written in his times. Akbar was very fond of learning. 'Akbar Nama', Sur Sagar, Ram Charitamanas are prominent among the books written during his time. Malik Muhammad Jayasis Padmavat and Keshav's Ram Chandrika were also written during the same period. Jahangir greatly patronized literature. Many scholars adorned his court. He too was a scholar of a high caliber and wrote his life story. During Shah Jahan's time there was a well known scholar named Abdul Hameed Lahori. He wrote Badshah Nama. The literary activities suffered during Aurangzeb's time. Urdu literature started developing during the last days of the Mughal emperor. This credit goes to Sir Sayyid Ahmed Khan and Mirza Galib. The language of Sir Sayyid Ahmed Khan was very simple and impressive. His compositions inspired the other Urdu writer Mirza Galib, who was a famous poet of his time. He made an important contribution to uplift Urdu poetry. There were some other writers also who took interest in Urdu poetry and enriched the Urdu literature. Maulvi Altab Hussain Ali, Akbar Allahabadi and Dr. Mohammed Iqbal are some famous names.

UNIT III: RELIGION AND PHILOSOPHY

1. Define Philosophy?

The noun **philosophy** means the study of proper behavior, and the search for wisdom. The original **meaning** of the word **philosophy** comes from the Greek roots philo- **meaning** "love" and -sophos, or "wisdom."

In a broad sense, philosophy is an activity people undertake when they seek to understand fundamental truths about themselves, the world in which they live, and their relationships to the world and to each other.

2. What is philosophy in simple words?

Philosophy is a way of thinking about the world, the universe, and society. It works by asking very basic questions about the nature of human thought, the nature of the universe, and the connections between them. The ideas in philosophy are often general and abstract.

3. What is the study of philosophy all about?

Philosophy is the study of the nature of existence, knowledge, truth and ethics. It involves consideration of the most fundamental questions about who we are, and examines philosophical thought across the breadth of history right up to the present day.

4. What are the roots or basics of Indian Philosophy?

A philosophical branch is a broad division of the overall subject. A philosophical doctrine is a particular theory, principle, position, system, code of beliefs or body of teachings. Philosophy as a whole is traditionally split into four or more main branches. The main four are:

Metaphysics (metaphysics is the study of the nature of reality, of what exists in the world, what it is like, and how it is ordered)

Epistemology (the study of knowledge, and how and what we know)or Epistemology is the study of knowledge. It is primarily concerned with what we can know about the world and how we can know it or The theory of knowledge, especially with regard to its methods, validity, and scope, and the

distinction between justified belief and opinion is known as epistemology

Ethics (the study of how people should act, and what is good and valuable)Or Is morality objective or subjective What is good? What makes actions or people good? What is right? What makes actions right?

Aesthetics (the study of basic philosophical questions about art and beauty)

In addition to these, two more branches are often added:

Logic (the study of good reasoning, by valid inference and demonstration) or What constitutes "good" or "bad" reasoning?

Political Philosophy (the study of how people should interact in a proper society)

5. Explain the religion and philosophy in ancient India?

Religion is the science of soul. Morality and ethics have their foundation on religion. Religion played an important part in the lives of the Indians from the earliest times. Religion in India was never static in character but was driven by an inherent dynamic strength. Every system of philosophy in India is a quest for Truth, which is one and the same, always and everywhere. The modes of approach differ, logic varies, but the purpose remains the same – trying to reach that Truth.

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"Indian religion which has taught the world tolerance and universal acceptance as true." Indian spirituality is deeply rooted in ancient philosophical and religious traditions of the land. Philosophy arose in India as an enquiry into the mystery of life and existence. Indian sages called Rishis or 'seers', developed special techniques of transcending the sense and the ordinary mind, collectively called yoga. With the help of these techniques, they delved deep into the depths of consciousness and discovered important truths about the true nature of human being and the universe.

The sages found that the true nature of the human being is not the body or the mind, which are ever changing and perishable but the spirit which is unchanging, immortal and pure consciousness. The Atman is the true source of human's knowledge, happiness and power. The rishis further found that all individual selves are parts of infinite consciousness which they called Brahman. Brahman is the ultimate reality, the ultimate cause of the universe. Ignorance of human's true nature is the main cause of human suffering and bondage. By gaining correct knowledge of Atman and Brahman, it is possible to become free from suffering and bondage and attain a state of immortality, everlasting peace and fulfillment known as Moksha. Religion in ancient India meant a way of life which enables a human to realize his true nature and attain Moksha

6. Describe the changes of Religious philosophy in medieval India?

Religious Condition When Islam came to India, Hinduism was in vogue. But by this time Hinduism had degenerated itself. There were superstitious beliefs, rituals and sacrifices. Brahmans had become very powerful and the caste system was very rigid. The people, especially the lower classes, were ill-treated. Islam was the opposite of what was in practise among the Hindus. It talked of equality, brotherhood and oneness of God. There were no dogmas in Islam. On the other hand, it had a simple doctrine and a democratic organisation.

- The Bhakti and Sufi movements were liberal movements within Hinduism and Islam emphasising a new and more personalised relationship between the human being and God

- The message of the Sufi movement was universal love and brotherhood of man.
- Because of their belief in the concept of unity of being, Sufis were able to establish an ideological relationship with Hindu thought.
- The Bhakti movement grew amongst Nayanars and Alvars of the south and stressed a new method of worship of God based upon devotional love.
- The Bhakti saints were divided into the Nirgun and Sagun believers.
- Unlike the Nirgun believers the Sagun believers saw God as having a definite form such as Rama or Krishna.
- The Bhakti and Sufi saints made valuable contributions to medieval Indian society in terms of laying a liberal foundation and promoting a tremendous growth of regional literature and local languages

RISE OF ISLAM AND SUFISM The Muslims first came to India in the eighth century AD mainly as traders. They were fascinated by the socio-cultural scenario in this country and decided to make India their home.. The immigrant Muslims also entered into matrimonial alliances with the local people and learned to live together in harmony. There was mutual exchange of ideas and customs. The Hindus and Muslims influenced each other equally in dress, speech, manners, customs and intellectual pursuits. The Muslims also brought with them their religion, Islam which had a deep impact on Indian society and culture. Prophet Mohammad preached Islam in the seventh century AD in Arabia. He was born in AD 571 in the Quraysh tribe of Arabia. He migrated to Madina from Mecca in AD 622 and this marked the beginning of the Hijira Era. According to the Muslim belief, Quran is the message of Allah revealed to Mohammad through his archangel Gabriel. It has been translated into several languages. The five fundamental principles of Islam are:

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After his death the Caliphate was established. There were four pious Caliphs. Islam talked of equality, brotherhood, and the existence of one God. Its arrival particularly made a profound impact on the traditional pattern of Indian society.

7. Write about religious reform movements in Modern India?

The impact of British rule in India led to a number of social and religious reforms.

- Raja Rammohan Roy can be regarded as the central figure of India's awakening for championing the spread of modern education, science and technology and for his relentless fight against many social evils.
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- Swami Vivekananda, a great humanist, through his Ramakrishna Mission condemned religious narrow mindedness, advocated free thinking and emphasised on service for the poor.
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UNIT III: RELIGION AND PHILOSOPHY

6. Define Philosophy?

The noun **philosophy** means the study of proper behavior, and the search for wisdom. The original **meaning** of the word **philosophy** comes from the Greek roots philo- **meaning** "love" and -sophos, or "wisdom."

In a broad sense, philosophy is an activity people undertake when they seek to understand fundamental truths about themselves, the world in which they live, and their relationships to the world and to each other.

7. What is philosophy in simple words?

Philosophy is a way of thinking about the world, the universe, and society. It works by asking very basic questions about the nature of human thought, the nature of the universe, and the connections between them. The ideas in philosophy are often general and abstract.

8. What is the study of philosophy all about?

Philosophy is the study of the nature of existence, knowledge, truth and ethics. It involves consideration of the most fundamental questions about who we are, and examines philosophical thought across the breadth of history right up to the present day.

9. What are the roots or basics of Indian Philosophy?

A philosophical branch is a broad division of the overall subject. A philosophical doctrine is a particular theory, principle, position, system, code of beliefs or body of teachings. Philosophy as a whole is traditionally split into four or more main branches. The main four are:

Metaphysics (metaphysics is the study of the nature of reality, of what exists in the world, what it is like, and how it is ordered)

Epistemology (the study of knowledge, and how and what we know)or Epistemology is the study of knowledge. It is primarily concerned with what we can know about the world and how we can know it or The theory of knowledge, especially with regard to its methods, validity, and scope, and the

distinction between justified belief and opinion is known as epistemology

Ethics (the study of how people should act, and what is good and valuable)Or Is morality objective or subjective What is good? What makes actions or people good? What is right? What makes actions right?

Aesthetics (the study of basic philosophical questions about art and beauty)

In addition to these, two more branches are often added:

Logic (the study of good reasoning, by valid inference and demonstration) or What constitutes "good" or "bad" reasoning?

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UNIT IV: FINE ARTS IN INDIA (ART, TECHNOLOGY, & ENGINEERING)

1. What are the Aims and objective of Art Education?

“Science is the most creative form of Art” – Sir C V Raman.

“Literature, music, and the arts, all are necessary for the development and flowering of a student to form an integrated total personality”. _ Rabindranath Tagore

Art education may be perceived as a tool for development of aesthetic sensibility among learners to enable them to respond to the beauty in colour, shape, form, movement and sound. It appreciates one's own cultural heritage and inculcate respect for others too. Activities, programmes, and themes should also be chosen and designed to promote values related to India's common cultural heritage, history of freedom movement, protection of environment.

Art education provides students non-verbal ways of learning about and interacting with world. Art becomes a means of creating meaning and knowledge construction. Artistic expression is used as a process of inquiring and exploration of the social realities, world of things, world of ideas, world of emotions, and world of imagination.

2. How Performing art forms helps to become better human beings?

The association of people with these art forms definitely makes them better human beings as the very nature of music, dance and drama elevates human soul and creates a pleasant atmosphere. The knowledge and practice of these art forms help in the development of one's personality. The people involved in these art forms can attain balance and peace of mind, self-restraint and love for all. Their performance makes them self-confident and capable of adapting to all circumstances. Negative feelings vanish as the soul of music, dance and drama teaches us all about loving and caring

3. Write about the famous painting of India?

The earliest specimens of creative painting in India can be traced to the prehistoric times.

- References to paintings of various types and their techniques are available in both Brahminical and Buddhist literature.
- Buddhist rock-cut caves of Ajanta in the western Deccan are famous for their wall paintings.
- The Mughals began a new era in painting by synthesising Indian painting with the Persian tradition.
- The Rajasthani and Pahari schools of painting have contributed significantly in the enrichment of Indian painting.
- In the late eighteenth and early nineteenth centuries, painting comprised of semiwesternised local styles based on Indian themes. Establishment of art schools on European model in major Indian cities like Calcutta, Bombay and Madras and particularly the emergence of the Bengal school of art were the other milestones in Indian painting during the modern period.
- The progressive artists like Francis Newton Souza, S.H. Raza, and M.F. Hussain broke away from the Bengal School of Art to represent the modern forceful art of independent India.
- Various folk art forms like Mithila paintings (Madhubani), Kalamkari painting,

Warli painting and Kalighat painting took Indian painting to new heights by adding new dimensions to it.

4. List few famous Indian Handicrafts

Handicrafts are an amalgamation of all things that can be built or crafted using hands.

Glassware was used by the Mughals in their palaces E.g: Sheesh Mahal. There is no evidence of glass beads in the Harappan civilization. In Vedic text "Satapatha Brahmana" the term for glass was Kanch.

There are various types of handicraft techniques that are used on cloth like weaving and printing. Bandhani is a technique where wooden blocks or printed cloths were used to make patterns on other material.

Special kind of Tie and Dye technique was called Laharia which created patterns like waves on the clothes.

Kalamkari utilizes the art of hand painting of fabric using vegetable dyes of the deep colors.

Ivory Crafting : Ivory carvings were exported from India during the Harappan period. There is evidence of ivory being used for handicrafts during Mughal period too.

Terracotta Crafts: This means baked clay. The process makes it water-proof and hard. This makes it suitable for pottery, bricks.

Clay and pottery : Pottery making is known as "Lyrics of handicrafts". Making objects out of clay has been one of the earliest things known to man. Vedic period saw "Painted greyware Pottery" being made.

Bronze craft : The dancing girl of Mohenjo-daro was an evidence of the art of metal casting. The earliest non ferrous metals used by man were copper and tin. These were mixed to obtain bronze.

India is a virtual treasure house of the most exquisite handicrafts. Simple objects of daily life have been crafted with delicate design which give expression to the creativity of the Indian artisan. Every state of India can boast of some unique creation which is special to the region, for example,

Kashmir : embroidered shawls, carpets, shawl and walnut wood furniture.

Rajasthan: tie-and-dye (bandhani) fabrics, jewellery, using precious stone and gems, blue glazed pottery and minakari work.

Andhra Pradesh: Bidri work and Pochampalli saris while

Tamil Nadu: bronze sculpture and Kancheepuram silk saris. Mysore is well known for silk, sandalwood items

Kerala : ivory carvings and rosewood furniture.

Madhya Pradesh: Chanderi and kosa silk

Lucknow: chikan work

Benaras: Brocade and silk saris cane furniture and goods of Assam,

Bankura terracotta modelling and handloom items of **Bengal** are just a few examples of

unique traditional decorative arts and crafts which constitute the heritage of modern India. These arts have been nurtured for thousands of years and provided employment to a great number of artisans who carried forward the art to the next generation. Thus you see how the Indian artisans with their magic touch can transform a piece of metal, wood or ivory into objects of art.

5. What are the two divisions of Indian classical Music?

(a) The Hindustani classical music of North India. (b) The Carnatic music of South India

6. What are the important components of Hindustani Music?

The roots of this music school belongs to Bharat "Natyasastra". The hindustani branch focuses more on musical structure and possibilities of improvisation on it. It also adopts a scale of "shudha Swara Saptaka" - Octave of Natural Notes.

The main styles of Hindustani music are :

Dhrupad :One of the oldest and grandest form of Hindustani music. This style reached its zenith in the court of Emperor Akbar. Dhrupad compositions usually have 4 to 5 stanzas and are performed by a duo.

Khayal :It is derived from the persian word "idea" and this style is attributed to Amir Khusrau.

Thumri :Is based on mixed ragas and is considered a semi classical form of music. It is derived from bhakti movement and hence the songs revolve around a girls devotion to Krishna. The songs are usually by a female voice.

Tappa :Originated from the folk songs of camel riders from north west. Compositions are fast, subtle and knotty constructions.

Tarana :It uses many words sung at a fast tempo.

Dhammar hori style:It is a very organised style and has a cycle of 14 beats. Compositions are erotic in nature and sung for Lord Krishna.

Ghazal :It is a poetic form that has rhyming couplets and a refrain with each line sharing the same meter. They never exceed 12 couplets. Ghazals originated in Iran and spread due to the influence of Sufi mystic in sultanate courts.

7. What are the components of Carnatic music?

It creates music on the traditional octave. The music is kriti based and focuses more on the saahitya or lyric quality of the musical piece.

Pallavi :First or second thematic lines of the composition are called Pallavi.

Anu Pallavi :Follows the pallavi and is sung at beginning or the end of the song.

Varnam :Usually sung at the beginning of the recital.

Ragamlika :Concluding part of the pallavi

8. What is Folk Music?

FOLK Music Besides classical music India has a rich legacy of folk or popular music. This music represents the emotion of the masses. The simple songs are composed to

mark every event in life. They may be festivals, advent of a new season, marriage or birth of a child. Rajasthani folk songs such as Mand and Bhatiali of Bengal are popular all over India. Ragini is a popular form of folk songs of Haryana. Folk songs have their special meanings or messages. They often describe historical events and important rituals. Kashmir's Gulraj is usually a folklore and Pandyani of Madhya Pradesh is a narrative put to music. Muslims sing Sojkhwani or mournful songs during Muharram and Christmas carols and choral music are sung in groups on the festive occasions.

9. What do you know about modern Indian music?

With the British rule came Western music. Indians adopted some of their instruments such as violin and clarinet to suit the demands of Indian music. Orchestration of music on stage is a new development. Use of cassettes replaced oral transmission of tunes and ragas. Performance which were earlier limited to a privileged few have now been thrown open to the public and can be viewed by thousands of music lovers throughout the country. Music education no longer depends on the master-disciple system but can be imparted through institutions teaching music.

Musicians: Amir Khusrau, Sadarang Adaranga, Miyan Tansen, Gopal Nayak, Swami Haridas, Pt. V.D. Paluskar, Pt. V.N. Bhatkhande, Thyagaraja Mutthuswami Dikshitar, Pt. Omkar, Nath Thakur, Pt. Vinaik Rao Patwardhan, Ustad Chand Khan, Ustad Bade Ghulam Ali Khan, Ustad Faiyaz Khan, Ustad Nissar Hussain Khan, Ustad Amir Khan, Pt. Bhimsen Joshi, Pt. Kumar Gandharva, Kesarbai Kerkar and Smt. Gangubai Hangal are all vocalists. Among the instrumentalists Baba Allauddin Khan, Pt. Ravi Shankar, Ustad Bismillah Khan, Ustad Alla Rakha Khan, Ustad Zakir Hussain are some of the well known musicians.

10. What are the different types of Indian Dances?

There are 8 classical dances in India: Bharat Natyam, Kuchipudi, Kathak, Kathakali, Mohiniattam, Sattriya, Odissi, Manipuri.

Bharat Natyam: Oldest classical dance and it originated in Tamil Nadu. It consists of nritya, nritya, bhava, abhinaya. The Devdasi used to perform these dances.

Kuchipudi: Andhra Pradesh is the origin. Tarangam is a unique dance with diya in the hands and vessels of water on the head.

Kathakali: originates in the state of Kerala. The performance is a combination of five elements like natyam, nritham, nrithyam, geetha and vadyam.

Mohiniattam: Graceful dance performed only by women. Origin in Kerala.

Odissi: originates in Orissa.

Manipuri: originates in Manipur. Movements are subtle and aim is devotion and grace.

Sattriya: Originates in Assam. Latest classical dance.

Kathak: Origin in north India. It was revitalized due to influence of Mughals on Indian culture.

11. What is Science?

Science fundamentally is the systematic study of the structure and behavior of the natural and physical world through observations and experiments.

Study of science evolved with the civilization of human beings.

12. What is Technology?

Technology (which is basically derived from the Greek word '*technologia*') is an art, skill or ability, which is used to create and develop products and acquire knowledge.

Scientists used their knowledge to develop technology and then used technology to develop Science; so, because of this reason science and technology are an integrated term in today's world.

13. What is the difference between Science and Technology

Science can be defined as any systematic activity that seeks to gain knowledge about the physical world. Technology is the Activity which seeks to put the knowledge of science into productive use.

14. Explain briefly about Ancient, Medieval, and Modern Indian Architecture?

One of the most enduring achievements of Indian civilization is undoubtedly its architecture. Indian architecture, which has evolved through centuries, is the result of socio-economic and geographical conditions. Different types of Indian architectural styles include a mass of expressions over space and time, transformed by the forces of history considered unique to India. As a result of vast diversities, a vast range of architectural specimens have evolved, retaining a certain amount of continuity across history.

Indian architecture, belonging to different periods of history, bears the stamp of respective periods. Though the cities of Indus Valley provide substantial evidence of extensive town planning, the beginnings of Indian architecture can be traced back to the advent of Buddhism in India. It was in this period that a large number of magnificent buildings came up. Some of the highlights of Buddhist art and architecture are the Great Stupa at Sanchi and the rock-cut caves at Ajanta. With the coming of the Muslim rulers, there developed a new architectural style in India- the Indo-Islamic architecture. The Indo-Islamic style was neither strictly Islamic nor strictly Hindu. The architecture of the medieval period can be divided into two main categories. They are the Delhi or the Imperial Style and the Mughal Architecture.

It was followed by a new style of architecture that developed as a result of colonization of India. This style of architecture came to be called as Indo-Saracenic. The Indo-Saracenic architecture combined the features of Hindu, Islamic and western elements. The colonial architecture exhibited itself through institutional, civic and utilitarian buildings such as post offices, railway stations, rest houses and government buildings.

Colonial Architecture: Like all other aspects, colonization of Indian also had an impact on architecture style. With colonization, a new chapter in Indian architecture began. The Dutch, Portuguese and the French made their presence felt through their buildings but it was the English who had a lasting impact on architecture.

Indo Islamic Architecture: The medieval period saw great developments in the field of architecture. With the coming of Muslims to India, many new features came to be introduced in buildings. The development of Muslim Style of Architecture of this period can be called the Indo-Islamic Architecture or the Indian Architecture influenced by Islamic Art. The Indo-Islamic style was neither strictly Islamic nor strictly Hindu. Ex. Taj Mahal, Red Fort, Qutub Minar

Ancient Architecture: Indian architecture is as old as the history of the civilization. The earliest remains of recognizable building activity in the India dates back to the Indus

Valley cities. Among India's ancient architectural remains, the most characteristic are the temples, Chaityas, Viharas, Stupas and other religious structures.

Cave Architecture: The cave architecture in India is believed to have begun in the third century BC. These caves were used by Buddhist and Jain monks as places of worship and residence. Initially the caves were excavated in the western India. Some examples of this type of cave structure are Chaityas and Viharas of Buddhists.

Rock Cut : The Rock-cut structures present the most spectacular piece of ancient Indian art specimen. Most of the rock-cut structures were related to various religious communities. In the beginning, remarkable Buddhist and Jain monuments were produced in areas such as Bihar in the east and Maharashtra in the west.

Temple Architecture : In ancient India, temple architecture of high standard developed in almost all regions. The distinct architectural style of temple construction in different parts was a result of geographical, climatic, ethnic, racial, historical and linguistic diversities. Ancient Indian temples are classified in three broad types. This classification is based on different architectural styles, employed in the construction of the temples. Ex. Konark temple, Sun Temple etc.,

13. Write about the contribution made by ancient Indians in the fields of Science and Technology?

Ancient Indian made immense contributions in Science and Technology. The important facts related to the Ancient Indian contribution in Science & Technology which will help the aspirants in the preparation of the Ideas in Science and Technology in Ancient India

Physics

- They conceptualised that the universe is composed of Panchbhutas – Water, land, fire and ether – each a medium of sense perception.
- They knew the existence of atoms and molecules even before the Greeks.
- Vaisheshika School elaborated the atomic theory.
- Brahmagupta anticipated Newton's theory of gravitation by declaring that – 'All things fall on the Earth by law of nature' and it is the nature of the Earth that attracts the things.

Mathematics

- Indians made three important contributions – notation system, decimal system and usage of zero.
- Indian notation system was adopted by Arabs and numerals are called Arabic in English. They are found in Ashokan inscription.
- Indians were the first to use the decimal system and Mathematician Aryabhata was associated with it.
- Knowledge of Geometry is reflected in the Sulvasutras of 5th century BC. Aryabhata (Surya Siddhanta) formulated the rule for finding out the areas of a triangle which led to the origin of Trigonometry.

Astronomy

- Jyotisha Vedanga (500 BC) is the earliest source dealing exclusively with astronomy. It contains rules for calculating the position of new and full moon amongst the 27 nakshatras.
- Aryabhata explained the true cause of solar and lunar eclipses, stated that the Sun is stationary and the Earth rotates around the Sun. He gave the value of π (3.1416), and stated that the Earth is spherical in shape in his book i.e. Aryabhatiya (499 AD).
- Varahamihira stated that the Moon rotates round the Earth, and the Earth rotates around the Sun in his book Brihat Samhita (6th Century AD).

Chemistry

- There was great development in Metallurgy with large scale production of various metals like gold, silver, copper, iron, brass and other alloys.
- Post Maurya Period steel products were exported to the west.
- Gupta period copper statue of Buddha from Sultanganj and iron pillar of Mehrauli at Delhi are the finest examples.

Medicine

- Charaksamhita of Charak (100 AD) refers to the various diseases with cure and treatments, also about prevention and control through diet
- Hymns of Atharvaveda is associated with Ayurveda.
- Susrutasamhita of Susruta refers to various kinds of diseases and operation with anaesthesia, surgical treatment, cataract, rhinoplasty etc.
- Charaksamhita of Charak (100 AD) refers to the various diseases with cure and treatments, also about prevention and control through diet

Apart from all the Ideas in Science and Technology during Ancient India, there was also the development of grammar and linguistics that help in the recitation of the Vedic prayer and mantra with meticulous correctness such as the production of Sanskrit grammar as in Astadhyayi of Panini in 400 BC and Mahabhasya of Patanjali in 2nd century BC. All these advancement first originated for religious purposes.

14. Write about the the developments in Science and Technology in Medieval India?

During the medieval period (eleventh to eighteenth century) science and technology in India was influenced by two scenarios: First is the earlier ancient tradition and second is by Islamic and European tradition.

People were invited from Arabia, Persia and also from Central Asia to teach in the madarsas. Arithmetic, menstruation, geometry, public administration, astronomy, accountancy and agriculture were some subjects included in primary education. Although numerous efforts were made by the rulers of that time to reform the education system but science did not make much development.

Akbar was focused on producing different breeds of domestic animals including elephants and horses. Tuzuk-i-Jahangiri is a book of Jahangir which has records of his observations and experiments of weeding and hybridisation. About 36 species of animals were mentioned in this book. Jahangir was also interested in the study of plants. Lilavati Kammdipika, Suddhantadipika and Lilavati Vyakhya are the books written by Gangadhar in which he gave rules for trigonometrical terms such as sine, cosine tangent and cotangent. Navankura on the Bijaganit of Bhaskara-II is written by Krishna of the Valhalla family. It was translated by Faizi, at the behest of Akbar. Akbar also ordered to make Mathematics a subject of study in his regime. Brahmagupta, a seventh century mathematician described negative numbers as debts and positive numbers as fortunes, it represents that they were aware with the utility of mathematics for practical trade. In the early medieval period, the two outstanding works in mathematics were Ganitasara by Sridhara, which deals with multiplication, division, numbers, cubes, square roots, mensuration among others, and Lilavati written by Bhaskara.

During Tipu sultan's regime, a paper-making factory was established in Mysore, that produced a gold-surfaced paper. The Mughals were familiar with the technique of producing gunpowder with the use of saltpeter, sulphur and charcoal in different ratios for use in different types of guns. The casting of cannons was mentioned in Tuzuk-i-Baburi.

Ain-i-Akbari gives a description of the 'Regulations of the Perfume Office of Akbar'. The attar of roses was among the most famous perfumes. An astronomical observation post was established by Firoz Shah Tughlaq. In Daulatabad, an observatory was established by Firoz Shah Bahmani under Hakim Hussain Gilani and Syed Muhammad Kazimi. Both lunar and solar calendars were in use. Mehendra Suri, a court astronomer of Firoz Shah developed an astronomical instrument called Yantraja. Five astronomical observatories were set up by Sawai jai Singh, Maharaja of Jaipur in five different cities, i.e., Delhi, Ujjain, Varanasi, Mathura and Jaipur.

Sarangdhara Samhita recommended opium as a medicine. A new medicine system was introduced in India by Muslims during eleventh century, i.e., Unani medicine system. MajinyeDiyae by Hakim Diya Muhammad is a compilation of Arabic, Persian and Ayurvedic medical knowledge. The field of agriculture witnessed some important changes such as introducing of new crops, trees and horticultural plants. The principal crops during that time were wheat, rice, barley, millets, pulses, oilseeds, sugarcane, indigo and cotton. New and improved horticultural methods were adopted. In the middle of the sixteenth century, Jesuits of Goa introduced systematic mango grafting. In the field of irrigation, wells, tanks, canals, rahats, charas (bucket made of leather) and dhenkli, were used for lifting of water with the help of yoked oxen, which continued to be the means of irrigation.

15. List few facts about Science & Technology of Modern India Facts in the field of Science and technology.

- At present, India is one of the most fascinating destinations for technology transactions in the world and it is ranked among the top five.
- At present, about 27 satellites (out of which 11 facilitate the communication network to the country) are active and in operations.
- Furthermore, India is ranked among the top ten nations in terms of the number of scientific publications.
- As per the report of the National Association of Software and Services Companies (NASSCOM), the analytics industry of India is expected to touch about USD 16 billion by 2015 from the current USD 2 billion.
- Very recently, with 1,000 MW capacity, the Kudankulam Nuclear Power Project Unit 1 (KKNPP 1) was set up.
- The KKNPP I is located in Tirunelveli, Tamil Nadu.
- To add to the existing project, with the same capacity (i.e. 1,000 MW), the Kudankulam Nuclear Power Project Unit 2 is under commissioning.
- The DRDO, i.e., the Defense Research and Development Organization has tied up with Snecma, a French engine maker to develop the Gas Turbine and Research Establishment (GTRE); the GTRE will improve the performance of the Kaveri engines.

- Kaveri engines are being used in 'Teja' the indigenous developed Light Combat Aircraft (LCA).
- The Indian Space Research Organization (ISRO) has successfully completed its mission of developing India's independent navigation system by launching the Indian Regional Navigation Satellite System (IRNSS – 1G).
- IRNSS – 1G is the seventh navigation satellite and it will reduce the country's dependency on US Global Positioning System.
- India recently has become an Associate Member State of the European Organization for Nuclear Research (CERN); the motive is to increase the collaboration between India and CERN's scientific and technological efforts and also promote the participation of Indian physicists, software engineers, and electronics hardware in global experiments.
- The DHR (i.e. Department of Health Research), Ministry of Health and Family Welfare planned to set up a three-tier national network of Viral Research and Diagnostic Laboratories (VRDLs).
- Under the project VRDLs, 160 VRDLs will be set up with the capacity to handle about 30 to 35 viruses of public health importance.
- The Department of Biotechnology, Ministry of Science and Technology of the Government of India has now become the second country outside of Europe to have joined the European Molecular Biology Organization (EMBO).

UNIT V: EDUCATION SYSTEM IN INDIA

1. What are the aims of education in ancient India?

In ancient India, education was a matter of individual concern. The aim of education was the development of pupil's overall personality.

With this view of education as a process of one's inner growth and self-fulfilment, techniques, rules : and methods were evolved.

It was believed that the development of a person meant, primarily, the training of his/her

mind as the instrument of acquiring knowledge.

This knowledge would enhance his/her creative capacity.

The thinking principle 'manana shakti' was reckoned higher than the subject of thinking. Thus, the primary subject of education was the mind itself.

2. Write about the education system in ancient India?

In the ancient time two education system Vedic and Buddhist was developed and their purpose was self control, development of character, Social awareness, personality development, propagation of purity and preservation of culture for youth.

These Vedas were written by the great sages (rishis) and were taught by teachers (Gurus) in Gurukuls. In those days, education was free and available to people of brahmin, kshatriya and vaishya castes. Shudras were not the recipients of learning. Though there wasn't any formal written curriculum, the Gurus ensured that any student living with them to seek knowledge was made to understand the intricacies of life in a theoretical as well as a practical way. The practical form of learning was encouraged more because it helped the student to integrate what was taught in a deep manner. Sanskrit formed the basis of delivering vedic education. Students were taught in the form of Shruti (listening) and Smriti (memorizing), since it was believed that this method ensured the preservation of knowledge across generations to follow. Education during the Vedic age was a journey from mortality to immortality, from chaos to spiritual bliss. Only after the ceremony of Upanayana Sanskara was a student considered eligible to begin his journey of learning. Personality development was given utmost importance since it helped in making the student capable of living a healthy and socially well-adjusted life. Indian education in ancient times was a process which molded and prepared the student to be able to execute his duties in the coming stages of life. Spiritual and intellectual thoughts were the basis of everyday living in the people. The Guru (teacher) and shishya (pupil) shared a very deep and intimate bond with each other. Students would reside in the forest at their teacher's residence and live a simple life as celibates till the completion of their education.

With the advent of Buddhism after the early Vedic Age, the former form of education was predominant for several years. But unlike the early Vedic system which had restricted its educational content to certain castes or strata of the society, Buddhism involved a more liberal approach towards learning. Knowledge was given to anyone seeking enlightenment at its doors.

Buddhist scriptures are replete with wise sayings of the Buddha, also known as Dhammapada. At this point of time, education was provided to students by monks and monasteries were the centers of learning. Buddhist education believed in imparting wisdom to an individual by awakening his/her inner conscience. It was believed that a person should be free from desires in order to be truly whole and complete.

The world famous universities of Nalanda and Taxila had been established under the patronage of rulers at that time. They were centers imparting knowledge in arts,

sciences, mathematics, theology, astrology, astronomies and medicine.

3. What were the subjects of study in ancient India?

Both Vedic and Buddhist systems of education had different subjects of study. The Vedic system comprised of the four Vedas(Rig Veda, Sama Veda, Yajur Veda and AtharvaVeda),six Vedangas (ritualistic knowledge, metrics, exegetics, grammar, phonetics and astronomy), the Upanishads, Tarka Shastra (logic, and reasoning) Puranas (history), and more. The main subjects in the Buddhist system were the three Pitakas (Vinaya, Abhidhamma and Sutta), the most recognized works of all 18 Buddhism schools. Certain other subjects common to both the systems were arithmetic, military science, law, performing arts, ethics, and art and architecture.

4. Give a description of education system in medieval India?

The time period between the 8th and 10th centuries saw the rise of many powerful kingdoms and dynasties that added glory to the Indian landscape. The Muslim rule began in India. The earlier scripts and languages were slowly replaced by Arabic and Persian in prominence. It was the time when Urdu took birth in the cradle of the Delhi Sultanate. Even though the earlier educational system in India was advanced and very futuristic in approach, it was the Muslim system of education which brought about the organization of learning into a proper system of schooling, comprising of primary and advanced levels of studies.

Primary education was imparted in schools known as maktabas and secondary and advanced language skills were taught in secondary schools known as madrasahs. In fact, Iltutmish, a prominent ruler of the Slave Dynasty was the founder of madrasahs in Delhi. These institutes of learning received patronage and special grants from Muslim rulers & emperors at the time. With time, universities sprouted in the cities of Lucknow, Allahabad and Delhi. Just like the Vedic times, teachers and students shared a very close bond with each other with the exception that they did not stay together.

Knowledge was imparted to students in a way befitting parents' love, liberal and strict at the same time. Each ruler contributed his bit during the medieval age for the betterment of learning among the classes and masses, but it was definitely the Mughals, especially Akbar, who saw Muslim education reach its zenith in India.

Pre-British Era (Late 15th Century to Early 18th Century)

This was the time before the advent of British rule in India. British India was preceded by a time when foreign powers in modern times included the Portuguese, the Dutch and the French. Where contribution of the Dutch in Indian education was less and more towards its South East Asian colonies, the Portuguese and French had given their bit in a very significant way.

The beginning of modern education started with the missionaries who migrated to India as the Portuguese begun setting up their colonies there. The missionaries with a wish to convert the native Indians into Christianity started with teaching small children along the streets. As time passed, these schools were attached to Churches and missionary offices. Portuguese pattern of education began to manifest itself in the form of primary schools, orphanages teaching vocational skills and a few colleges and a university.

Primary education was of utmost importance, hence more number of such schools. Knowledge in these times was dispensed in Portuguese and Latin languages. Then came in the French in 17th century who formed their stronghold as the French East India Company. This company too adopted the pattern of education along similar lines of the Portuguese, but they extended their reach of teaching and learning beyond the borders of religion. They even set up institutions in Mahe, Pondicherry, Madras, Chandernagore and Karikal. Secondary schools were set up at some places to impart higher learning. Things were going pretty good until the British finally staked their claim on the Indian subcontinent in the 1600s, slowly and steadily. No time was wasted by the British to create a propaganda which undermined the Indian culture and upheld western values, traditions and works. This was a colonial power which very intelligently twisted the teachings and knowledge of the great scriptures written in Sanskrit and brought out only the aspects which were deemed negative. The masses were educated and falsely made to realize that theirs was a race which was 'lower' as compared to the 'whites.'

Even though some governors worked hard to bring about positive changes in some social norms prevalent at the time, the British hardly made any efforts to educate Indians on a serious basis.

However, the Woods' Dispatch in 1854 did manage to bring about the establishment of Department of Education in different provinces. The famous Indian universities of Calcutta, Bombay, Madras, Punjab and Allahabad were established in this period.

5. Discuss the changes about Modern Indian Education System?

After 200 years, till India gained independence in 1947. This was a pivotal period in modern Indian history.

The British during the 1820s were very keen on promotion and continuation of the Indian education model followed by Madrasahs (Mohammedan College) and the Hindu College in order to bring a 'favorable image' of the British Government. In 1800, Lord Wellesley, the Governor General of Fort Williams, established a college in his area of jurisdiction where training was imparted to civil servants in vernacular languages.

Then came the year 1813 when the British monarchy declared the Charter Act which granted an annual expenditure of 1 lakh rupees to the British East India Company. This was in order to "revive and promote literature and the encouragement of then learned natives of India and for the introduction and promotion of knowledge of science among the inhabitants of the British territories."

It was being debated where the funds allocated should exactly be used, whether in promotion of Western or that of the Oriental form of education. Majority prevailed and Oriental education was given preference. Lord William Bentinck took on the role as India's Governor General in the year 1828 and throughout his tenure brought many reforms to make influential changes in British India. Things were somewhat quiet and peaceful for some time; till the time when the British actually began consolidating their rule in the Indian subcontinent. Dominion over a region meant control not only over the lands but also minds of the people.

Sir Macaulay, after very 'astute observations' made some remarks which as famous in the pages of history as 'Macaulay's minutes.' A very prominent phrase among these minutes pointed out that –

"It is, no exaggeration to say, that all the historical information which has been collected from all the books written in Sanskrit language is less valuable than what may be found in the most paltry abridgments used at preparatory schools in England."

And these very words turned the wheels of the Indian education system in the British era. The British mostly targeted members of the elite classes in India, who had a love for westernization and at the same time not so much love for their own country.

The modern Indian Education (1947 onward.....)

It has been several years since India gained independence from the British back in 1947. Today the basis and structure of learning has changed significantly, with a few remnants of the British Era.

Schools, colleges and universities are centers of learning, where everything; right from pre-primary to post doctoral education is offered. Technology and globalization have made the world into a small village because of which India is now among the popular destinations for students of foreign origin too!

Education today is provided in a holistic manner which involves equal contribution of academic and extra-curricular activities. It is believed that equal participation in activities like sports, debates, group activities and other cultural activities make a better personality with better decision making abilities.

Post independence, our leaders drafted a beautiful constitution which enshrined the fundamental rights of its citizens, one of them being, 'The right to free and compulsory primary education.' Because it is believed that the true development of any nation is in the hands of its empowered citizens.

Today, India boasts of several centers of higher learning with a place in international rankings. Learning today is just not limited to regular classroom teachings but has spread its reach in the form of distance education and open learning. What was a diminutive 12% during the British rule, today stands at 74.04%, according to the national census conducted in 2011

Education over the years has changed its face, form and methods of deliverance. Humanity may have affected the way in which learning impacts young minds, but the true essence of education was and will always remain the same...

6. What do you know about the Science and Scientists of Ancient India?

"We owe a lot to the ancient Indians, teaching us how to count. Without which most modern scientific discoveries would have been impossible." – Albert Einstein

One of the oldest civilizations in the world, the Indian civilization has a strong tradition of science and technology. Ancient India was a land of sages and seers as well as a land of

scholars and scientists. Research has shown that from making the best steel in the world to teaching the world to count, India was actively contributing to the field of science and technology centuries long before modern laboratories were set up. Many theories and techniques discovered by the ancient Indians have created and strengthened the fundamentals of modern science and technology.

- Science and Mathematics were highly developed during the ancient period in India.
- Some famous ancient Indian Mathematicians were Baudhayan, Aryabhatta, Brahmgupta, Bhaskaracharya, Mahaviracharya.
- Some famous scientists were Kanad, Varahamihira, Nagarjuna. Medical Science was also highly developed in ancient India.
- Ayurveda is the indigenous system of medicine that was developed in Ancient India. The word Ayurveda literally means the science of good health and longevity of life.
- Charak is called the father of ayurvedic medicine and Susruta the father of surgery in ancient India.
- Susruta's greatest contribution was in the fields of Rhinoplasty (plastic surgery) and Ophthalmic surgery (removal of cataracts).
- Charak Samhita, written by Charak is a remarkable book on medicine.
- The science of Yoga was developed in ancient India as an allied science of Ayurveda for healing without medicine at the physical and mental level.
- Patanjali was the first scholar to present this great science systematically in his Yoga

7. List any six contributions made by Ancient Indians Scientists to the world of Science?

The Idea of Zero: Little needs to be written about the mathematical digit 'zero', one of the most important inventions of all time. Mathematician Aryabhata was the first person to create a symbol for zero and it was through his efforts that mathematical operations like addition and subtraction started using the digit, zero. The concept of zero and its integration into the place-value system also enabled one to write numbers, no matter how large, by using only ten symbols.

The Decimal System: India gave the ingenious method of expressing all numbers by means of ten symbols – the decimal system. In this system, each symbol received a value of position as well as an absolute value. Due to the simplicity of the decimal notation, which facilitated calculation, this system made the uses of arithmetic in practical inventions much faster and easier.

Numeral Notations: Indians, as early as 500 BCE, had devised a system of different symbols for every number from one to nine. This notation system was adopted by the Arabs who called it the hind numerals. Centuries later, this notation system was adopted by the western world who called them the Arabic numerals as it reached them through

the Arab traders.

A Theory of Atom –acharyakana: One of the notable scientists of the ancient India was Kanad who is said to have devised the atomic theory centuries before John Dalton was born. He speculated the existence of anu or a small indestructible particles, much like an atom. He also stated that anu can have two states – absolute rest and a state of motion. He further held that atoms of same substance combined with each other in a specific and synchronized manner to produce dyvanuka (diatomic molecules) and tryanuka (triatomic molecules).

Plastic Surgery- Susruta: Written by Sushruta in 6th Century BC, Sushruta Samhita is considered to be one of the most comprehensive textbooks on ancient surgery. The text mentions various illnesses, plants, preparations and cures along with complex techniques of plastic surgery. The Sushruta Samhita 's most well-known contribution to plastic surgery is the reconstruction of the nose, known also as rhinoplasty.

Cataract Surgery: The first cataract surgery is said to have been performed by the ancient Indian physician Sushruta, way back in 6th century BCE. To remove the cataract from the eyes, he used a curved needle, Jabamukhi Salaka, to loosen the lens and push the cataract out of the field of vision. The eye would then be bandaged for a few days till it healed completely. Sushruta's surgical works were later translated, his works were introduced to the West.

Ayurveda: Long before the birth of Hippocrates, Charaka authored a foundational text, Charakasamhita, on the ancient science of Ayurveda. Referred to as the Father of Indian Medicine, Charaka was the first physician to present the concept of digestion, metabolism and immunity in his book. Charaka's ancient manual on preventive medicine remained a standard work on the subject for two millennia and was translated into many foreign languages, including Arabic and Latin.

Iron-Cased Rockets-Rocket_warfare: The first iron-cased rockets were developed in the 1780s by Tipu Sultan of Mysore who successfully used these rockets against the larger forces of the British East India Company during the Anglo-Mysore Wars. He crafted long iron tubes, filled them with gunpowder and fastened them to bamboo poles to create the predecessor of the modern rocket. With a range of about 2 km, these rockets were the best in the world at that time and caused as much fear and confusion as damage. Due to them, the British suffered one of their worst ever defeats in India at the hands of Tipu.

8. Explain about Science and Scientists of Medieval India?

The medieval period marks the coming of Muslims in India. The pattern of education as prevalent in Arab countries was gradually adopted during this period.

The two brothers, Sheikh Abdullah and Sheikh Azizullah, who were specialists in rational Muslim rulers attempted to reform the curriculum of primary schools. Some important subjects like Arithmetic, Mensuration, Geometry, Astronomy, Accountancy, Public Administration and Agriculture were included in the courses of studies for primary education. Though special efforts were made by the ruler to carry out reforms in education,

Large workshops called karkhanas were maintained to supply provision, stores

and equipments to royal household and government departments. The karkhanas not only worked as manufacturing agencies, but also served as centres for technical and vocational training to young people. The karkhanas trained and turned out artisans and craftspeople in different branches, who later on set up their own independent karkhanas.

Mathematics: Narayana Pandit, son of Narsimha Daivajna was well known for his works in Mathematics – Ganitakaumudi and Bijaganitavatamsa. Gangadhara, in Gujarat, wrote Lilavati Karamdipika, Suddhantadipika, and Lilavati Vyakhya. These were famous treatises which gave rules for trigonometrical terms like sine, cosine tangent and cotangent. Nilakantha Somasutvan produced Tantrasamgraha, which also contains rules of trigonometrical functions.

Ganesa Daivajna produced Buddhivilasini - a commentary on Lilavati - containing a number of illustrations. Krishna of the Valhalla family brought out Navankura on the Bijaganit of Bhaskara-II and elaboration of the rules of indeterminate equations of the first and second orders. Nilakantha Jyotirvida compiled Tajik, introducing a large number of Persian technical terms. Faizi, at the behest of Akbar, translated Bhaskara's Bijaganit. Akbar ordered to make Mathematics as a subject of study, among others in the education system. Naisiru'd -din-at -tusi, was another scholar of Mathematics.

Biology: Hamsadeva compiled a work in the field of Biology entitled Mrga-paksi-sastra in the thirteenth century. Akbar had a special interest in producing goodbreeds of domestic animals like elephants and horses. Jahangir, in his work - Tuzuk-ijahangiri - recorded his observations and experiments on breeding and hybridization. .

Chemistry: Use of paper had begun, An important application of Chemistry was in the production of paper. Kashmir, Sialkot, Zafarabad, Patna, Murshidabad, Ahmedabad, Aurangabad and Mysore became well known centres of paper production. The paper making technique was more or less the same throughout the country differing only in preparation of the pulp from different raw materials. The Mughals knew the technique of production of gunpowder and its use in gunnery, another application of Chemistry. The Indian craftspeople learnt the technique and evolved suitable explosive composition. The work Sukraniti attributed to Sukracarya contains a description of how gunpowder can be prepared using saltpeter, sulphur and charcoal in different ratios for use in different types of guns.. The principal type of fire works included those which pierce through air, produce sparks of fire, blaze with various colours and end with explosion. The attar (perfume) of roses was a popular perfume, which is supposed to have been discovered by Nurjehan

Astronomy: Astronomy was another field that flourished during this period. In astronomy, a number of commentaries dealing with the already established astronomical notions appeared. Mehendra Suri, a court astronomer of Emperor Firoz Shah, developed an astronomical instrument 'Yantraja'. Paramesvara and Mahabhaskariya, both in Kerala, were famous families of astronomers and almanac-makers. Nilakantha Somasutvan produced commentary of Aryabhatiyaa. Kamalakar studied the Islamic astronomical ideas. He was an authority on Islamic knowledge. Maharaja Sawai Jai Singh-II of Jaipur was a patron of Astronomy. He set up the five astronomical observatories in Delhi, Ujjain, Varanasi, Mathura and Jaipur.

Medicine: The Ayurveda system of medicine did not progress as vigorously as it did in the ancient period because of lack of royal patronage. However, some important treatises on Ayurveda like the Sarangdhara Samhita and Chikitsasamgraha by Vangasena, the Yagaratbajara Science and Scientists of Medieval India. Technology and the Bhavaprakasa of Bhavamisra were compiled. The Sarangdhara Samhita, written in the thirteenth century, includes use of opium in its material medica and urine examination for diagnostic purpose. The drugs mentioned include metallic preparation of the rasachikitsa system and even imported drugs. The Rasachikitsa system, dealt principally with a host of mineral medicines, both mercurial and non-mercurial. The Siddha system mostly prevalent in Tamil Nadu was attributed to the reputed Siddhas, who were supposed to have evolved many life-prolonging compositions, rich in mineral medicines. The Unani Tibb system of medicine flourished in India during the medieval period. Ali-binRabban summarized the whole system of Greek medicine as well as the Indian medical

Agriculture: In the medieval period, the pattern of agricultural practices was more or less the same as that in early India. Some important changes occurred in the introduction of new crops, trees as well as horticultural plants by foreign traders. The principal crops were wheat, rice, barley, millets, pulses, oilseeds, cotton, sugar-cane and indigo. The Western Ghats continued to yield black pepper of good quality and Kashmir maintained its tradition for saffron and fruits. Ginger and cinnamon from Tamil Nadu, cardamom, sandalwood and coconut from Kerala, were becoming increasingly popular. Tobacco, chillies, potato, guava, custard apple, cashew and pineapple were the important plants which were introduced to India during the sixteenth and seventeenth centuries. It was during this period that the production of opium from poppy plants began in Malwa and Bihar regions. Improved horticultural methods were adopted with great success. The systematic mango-grafting was introduced by the Jesuits of Goa in the middle of sixteenth century. Imperial Mughal Gardens were suitable areas where extensive cultivation of fruit trees came up.

For irrigation, wells, tanks, canals, rahat, charas and dhenkli charas (a sort of a bucket made of leather used to lift water with the help of yoked oxen) were used. Persian wheel was used in the Agra region. In the medieval period, agriculture was placed on a solid foundation by the State by introducing a system of land measurement and land classification, beneficial both to the rulers as well as the tillers.

8. Write about the Science and Scientists of Modern India

Srinivasa Ramanujan was a great mathematical genius of India who has several outstanding achievements in this field to his credit.

C.V. Raman was an outstanding Indian scientist who won the Nobel Prize for Physics in 1930. His finding that light is made up of particles known as photons is known as the Raman Effect.

Dr. J.C. Bose is credited with the invention of the Crescograph that can record plant growth and movement, among other achievements, like devising instruments known as Bose instruments.

Dr. Homi Bhabha was another great Indian Scientist who led India into the atomic age.

Dr. Vikram Sarabhai was another great genius of modern India who was behind the launching of India's first satellite Aryabhata. He was also a great industrialist who founded many industries. He was the chairperson of INCOSPAR and the Atomic Energy Commissions.

Dr. A.P.J. Abdul Kalam, the President of India, developed the SLV3 which put the satellite Rohini into orbit. As Director of DRDO, he developed five projects - Prithvi, Trishul, Akash, Nag and Agni. He continues to inspire the Indian youth till today