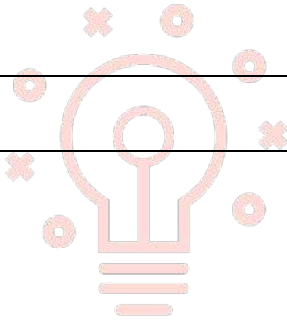




**ANTHROPOLOGY**  
**PAPER-1**  
**MAINS 2019**



**SAMPLE ANSWERS**

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**Specializing in UPSC Anthropology**

Under Guidance of Dr Arjun Bopanna



Section-A

**Q1. Write short notes on the following in about 150 words each:**

- a) The relationship between Linguistics and Social – Cultural Anthropology (10 Marks)
- b) Cultural Relativism (10 Marks)
- c) Pastoralism in India (10 Marks)
- d) Cultural Materialism (10 Marks)
- e) Relative Dating Methods (10 Marks)

**Q2.**

- a) Discuss the evolutionary significance of bipedalism and erect posture. (20 Marks)
- b) How did Radcliffe-Brown and Levi-Strauss study kinship in terms of social structure? (15 Marks)
- c) Elucidate Mesolithic culture and associated rock art with examples from India. (15 Marks)

**Q3.**

- a) Discuss social stratification according to any three major approaches. (20 Marks)
- b) “Europeans are closer to Neanderthals.” Critically discuss in view of African origin of humankind. (15 Marks)
- c) Discuss briefly the major traditions in the Upper Palaeolithic culture of Europe. (15 Marks)

**Q4.**

- a) With the reference to somatoscopic and morphometric characteristics commonly used for racial classification, make critical comments as to whether “Race” is a valid concept. (20 Marks)
- b) Critically explain the anthropological approaches to religion. (15 Marks)
- c) Differentiate between transient and balanced genetic polymorphism. Illustrate your answer with suitable examples from human populations. (15 Marks)

Section- B

**Q5. Write notes on the following in about 150 words each:**

- a) Adaptive primate radiation (10 Marks)
- b) Implications of mutation in evolution (10 Marks)
- c) Olduvai Gorge (10 Marks)
- d) Anthropological inputs in facial reconstruction (10 Marks)
- e) Genetico-environmental factors affecting human growth. (10 Marks)

**Q6.**

- a) Examine critically the contributions of Victor Turner and Clifford Geertz. (20 Marks)
- b) “Human adaptations are always bio-cultural in nature.” Discuss with reference to human adaptation to high-altitude climate. (15 Marks)
- c) Discuss the methods of studying human growth with their merits and demerits. (15 Marks)

**Q7.**

- a) Discuss how indigenous people encounter globalization. (20 Marks)
- b) “Applied human genetics has come to touch every sphere of human life.” Discuss in light of recent advances in molecular anthropology. (15 Marks)
- c) Evaluate participant observation in producing anthropological knowledge. (15 Marks)

**Q8.**

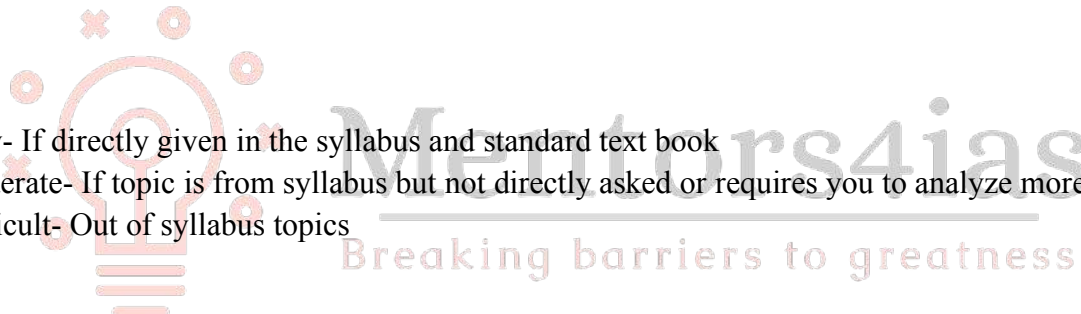
- a) Discuss with examples the Megalithic culture of India in the archaeological context. (20 Marks)
- b) Discuss the bio-cultural factors influencing fertility in light of the relationship between fecundity and fertility. (15 Marks)
- c) Discuss phenomenology as a research method in anthropological studies. (15 Marks)



Marks and Question Distribution- Paper 1					
	General Anthropology (Including basics of evolution)	Archaeological anthropology	Social-cultural anthropology	Theorists	Biological anthropology
<b>Number of questions</b>	3	7	7	3	8
<b>Total Marks</b>	30	105	105	45	115

**Note:**

- Easy- If directly given in the syllabus and standard text book
- Moderate- If topic is from syllabus but not directly asked or requires you to analyze more
- Difficult- Out of syllabus topics





**1 (a) The relationship between Linguistics and Social – Cultural Anthropology**

**Structure:**

- Explain the origin of the discipline
- How language is important in Anthropology and how linguistics can help
- Scope of linguistic anthropology and its similarity with Linguistics
- Difference between the two

**Supporting points:**

**Historical:**

- Anthropology and linguistics share a common intellectual origin in 19th Century scholarship.
- The impetus that prompted the first armchair cultural anthropologist to look for the origins of human customs through comparison of groups of human beings also prompted the earliest linguistic inquiries.
- There was considerable overlap in these processes.
- The “discovery” of Sanskrit by the British civil servant and intellectual, Sir William Jones in the late 18th Century set the stage for intensive work in comparative historical linguistics that continues to the present day.
- Jacob Grimm a 19th Century linguistics through his discovery of regularities in consonantal shifts between different branches of Indo-European languages over historical time. His formulation, called today Grimm’s Law was not only the basis for modern linguistics, but also one of the formative **concepts leading to 20th Century structuralism in social cultural anthropology.**
- **Linguistics** was arguably **introduced into the formal study of anthropology** by **Franz Boas**, who exercised enormous influence on the discipline through his own work and that of his students. In America thus 1 of the sub branches is linguistic anthropology.
- Starting in the 20th Century, anthropological linguistics began to develop along somewhat different lines than formal linguistics.
- Anthropological linguistics today generally views language through a cultural and behavioral lens rather than through a formal, cognitive lens.

**Similarities (complementing each other)**

- Linguistic Anthropological definitely concerns itself with the formal properties of phonetics, phonemics, morphemics and syntax, as well as the cognitive skills that are required for linguistic communication. Thus linguistic anthropology has lot in common with linguistics
- How Linguistics can help Social anthropologists? Social scientists pile up huge amounts of text, usually without looking at it as text. Various researchers have demanded that they pay attention to the structure, rhetoric, and materiality of media texts, documents, interviews, surveys. Linguists can provide a start on the detailed analysis.



- Anthropologists need ways of categorising types of texts. Linguists have a body of work on analysing written and spoken (and more recently, visual) texts.
- Linguists have developed large collections of language data. The collections themselves may not be of interest to most anthropologists, who would have their own preferred designs. But the tools for searching and comparing data/text could be useful to anthropologists who want to extend their analyses beyond the few texts they can analyse in detail by hand.
- Very similarly, sociolinguistics, considered another subset of linguistics, is the study of how people use language in different social situations. Sociolinguistics includes the study of dialects across a given region and an analysis of the way some people may speak to each other in certain situations, for example, at a formal occasion, slang between friends and family, or the manner of speaking that may change based on the gender roles.

### Dissimilarities:

- Social cultural anthropology's central questions lie in how language is used in the social and cultural life of people in different societies.
- It is also concerned with the broad question of how language evolved as part of the repertoire of human biological skills and behavioral adaptation.
- Linguistic anthropologists have ventured into the study of everyday encounters, language socialization, ritual and political events, scientific discourse, verbal art, language contact and language shift, literacy events, and media. So, unlike linguistics, linguistic anthropologists do not look at language alone, language is viewed as interdependent with culture and social structures.
- Anthropologists study the relation between worldviews, grammatical categories and semantic fields, the influence of speech on socialization and personal relationships, and the interaction of linguistic and social communities. In this case, linguistic anthropology closely studies those societies where language defines a culture or society.
- For example, in New Guinea, there is a tribe of indigenous people who speak one language. It is what makes that people unique. It is its "index" language. The tribe may speak other languages from New Guinea, but this unique language gives the tribe its cultural identity.
- Linguistic anthropologists may also take an interest in language as it relates to socialization. It can be applied to infancy, childhood, or a foreigner being enculturated.
- The anthropologist would likely study a society and the way that language is used to socialize its young.
- On the other hand, linguists will focus more on the way words are formed, for example, the phonology or vocalization of the language to semantics and grammar systems. For example, linguists pay close attention to "code-switching," a phenomenon that occurs when two or more languages are spoken in a region and the speaker borrows or mix the languages in normal discourse. A linguistic anthropologist may be interested in code-switching as it affects the society and evolving culture, but will not tend to focus on the study of code-switching, which would be more of an interest to the linguist.

**Difficulty level: Moderate to Difficult**



1 (b) Cultural relativism

**Structure-**

- Definition
- Brief background of how the concept originated.
- write briefly about Franz Boas
- Features (including negative)

**Supporting points:**

Cultural relativism is the belief that the culture of people serves particular needs and must be looked at in terms of the world the people inhabit. This is often the perspective of social scientists who work with people and is the result of the work of anthropologist Franz Boas.

**Discussion:**

- The two concepts of ethnocentrism and cultural relativism occupy key positions in socio-cultural anthropology. They are the most sensitive and controversial issues in sociology and socio-cultural anthropology.
- Cultural Relativism/ Cultural determinism approach was first formulated by Franz Boas in North America in 19th century. He says no culture should be judged by the standards of another.
- Cultural relativism views people’s behaviour from the perspective of their own culture. It places a priority on understanding other cultures, rather than dismissing them as “strange” or “exotic.”
- Any part of a culture must be viewed from within its cultural context-not that of the observer or the notion that there are no universal standards by which all cultures may be evaluated.
- Cultures must be analyzed with reference to their own histories and culture traits understood in terms of the cultural whole.

- The general pattern is to judge the behaviour of other people in other groups by the standards of our own culture is Ethnocentric. In his book “Folkways” Sociologist William Graham Sumner coined the term ethnocentrism to refer to the tendency to assume that one’s culture and way of life are superior to all others. (Sumner 1906).
- The ethnocentric person sees his or her own group as the center or defining point of culture and views all other cultures as deviations from what is “normal.” Anthropologists endeavor as far as possible to avoid ethnocentrism.

**Cultural relativism- issue:**

- Can perpetuate human rights violation in society as any cultural practice can be justified from its historical perspective.
- It can be used to justify traditions desired by dominant or powerful class
- Retard social change and progress

**Difficulty level: Easy**

**Mentors4ias test series:**

**Test 4: Question 2 (b) Discuss the concept of Ethnocentrism and cultural relativism**





### 1(c) Pastoralism in India

#### Structure:

- Define Pastoralists in Indian context and give some general information
- Explain their socio economic features of Indian Pastoral community
- Substantiate it with some examples

#### Supporting points-

In the Indian context, pastoralists can be defined as "members of caste or ethnic groups with a strong traditional association with livestock-keeping, where a substantial proportion of the group derive over 50% of household consumption from livestock products or their sale, and where over 90% of animal consumption is from natural pasture or browse, and where households are responsible for the full cycle of livestock breeding."

- In Africa and the Middle East, pastoralists are **usually tribally organized** and associated with particular territories inhabited exclusively by them. By contrast, in India, pastoralists are integrated into the caste system, representing endogamous social groups with a professional specialization in animal husbandry.
- Geographically, nomadic pastoralism is most prevalent in the drylands of Western India (Thar Desert) and on the Deccan Plateau, as well as in the mountainous regions of North India (Himalayas).
- Types of livestock kept in mobile pastoral systems include buffaloes, sheep, goats, camels, cattle, donkeys, yaks, and even ducks are raised under transhumant (a seasonal movement of livestock between fixed summer and winter pastures) conditions. But there are also more sedentary forms of pastoralism, represented for instance by the buffalo breeding Toda in western ghats.
- Indian pastoralists can be divided into groups that practice horizontal movement patterns in the dryland regions and vertical movement patterns in the mountainous areas.

#### Pastoralism in the Indian Himalayas

- Involves cyclical movements from lowlands to highlands to take advantage of seasonally available pastures- Migratory pastoralism
- Goat and sheep herding Bakrawals of Jammu and Kashmir, the buffalo herding Gujjars in Kashmir, parts of Himachal Pradesh and Uttar Pradesh, the goat and sheep herding Gaddis, Kanets, Kaulis and Kinnauras in Himachal Pradesh, the sheep herding Bhotias of Uttar Pradesh, yak herding Sherpas of Khumbu, Nepal and less well-known communities in the mountains of Bhutan, Sikkim and Arunachal Pradesh.
- Some pastoralists in the Himalayas are agro-pastoralists and besides rearing animals they also cultivate land, although the major portion of their household income is drawn from pastoral activities. In addition, they also engage in a multitude of other



economic activities like handicrafts, trade and transport. For example, the Gaddis, in Himachal Pradesh are known for their beautiful handicrafts; the embroidered caps made by Gujjars are also famous. The Bhotias are the most prominent trading community on the Indo- Tibet border and similarly Changpas in Ladakh are involved in cross border trade with Tibet.

### Pastoralism in Western India

- It includes “Old World Arid Zone Belt” that stretches across Northern Africa and Northern Asia and has given rise to many pastoral cultures, reaches its most eastern point in Northern India. Its limit is marked by the Aravalli mountain chain
- In this region pastoralism can be a market-oriented strategy by landless people specialized in the production of animals and animal products for sale; but it can also be a subsistence and drought adaptation strategy by people who own land.
- The pastoral castes of Western India are presumed to have immigrated into the area from Afghanistan, Baluchistan and Pakistan.
- In general there are many similarities in dress and customs between the pastoralists of Western India and their counterparts to the west.
- Although there are exceptions, most pastoralists are Hindus integrated into the village caste mosaic, for which animal husbandry represents a hereditary profession.
- The majority of them are connected with particular livestock species by their myth of origin, tracing their descent to an ancestor who was created by God for the purpose of taking care of these animals. For instance, the Raika/Rebari are linked to the camel, the Charan in Gujarat are associated with cattle, and the Bharvad keep mostly small stock.
- Because of this heritage, these pastoralists are endowed with a special sense of responsibility for the welfare of their livestock.
- Taboos against the selling of livestock for slaughter were prevalent earlier and even now persist among some groups.
- Some castes that originally were pastoralists have switched to crop farming, for instance the Ahir who are now the main farming caste around Junagadh in Saurashtra region of Gujarat.
- On the other hand, some members of castes who own land and are considered as cultivators have recently taken up (often nomadic or semi-nomadic) pastoralism because of good economic returns. These are known as “non-traditional” pastoralists and, in Rajasthan, include Rajputs and Meghwals.

**Difficulty level: Moderate to difficult**

**Mentors4ias test series: Test 1: Question 1 (a) Pastoral community in India.**





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**1 (d) Cultural materialism**

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**Structure:**

1. Define culture materialism
2. Marwin Harris and his work
3. Its premises
4. Significance with examples
5. Criticism- Marxists, Cognitive anthropologists, post modernists
6. Link with some Indian studies- Sacred Cow

**Supporting points:****Basic Premises**

- Coined by Marvin Harris in his 1968 text, *The Rise of Anthropological Theory*, cultural materialism embraces three anthropological schools of thought: cultural materialism, cultural evolution and cultural ecology
- Emerging as an expansion of Marxism materialism, cultural materialism explains cultural similarities and differences as well as models for cultural change within a societal framework consisting of three distinct levels: infrastructure, structure and superstructure.
- Cultural materialism promotes the idea that
  - infrastructure, consisting of “material realities” such as technological, economic and reproductive (demographic) factors mold and influence the other two aspects of culture.
  - The “structure” sector of culture consists of organizational aspects of culture such as domestic and kinship systems and political economy,
  - while the “superstructure” sector consists of ideological and symbolic aspects of society such as religion.
- Therefore, cultural materialists believe that technological and economic aspects play the primary role in shaping a society.
- Cultural materialism aims to understand the effects of technological, economic and demographic factors on molding societal structure and superstructure through strictly scientific methods.
- As stated by Harris, cultural materialism strives to “create a pan-human science of society whose findings can be accepted on logical and evidentiary grounds by the pan-human community”
- Cultural Materialists believe that all societies operate according to a model in which production and reproduction dominate and determine the other sectors of culture effectively serving as the driving forces behind all cultural development.



- They propose that all non-infrastructure aspects of society are created with the purpose of benefitting societal productive and reproductive capabilities. Therefore, systems such as government, religion, law, and kinship are considered to be constructs that only exist for the sole purpose of promoting production and reproduction.
- Calling for empirical research and strict scientific methods in order to make accurate comparisons between separate cultures, proponents of cultural materialism believe that its perspective effectively explains both intercultural variation and similarities. As such, demographic, environmental, and technological changes are invoked to explain cultural variation.

### Points of Reaction

- As with other forms of materialism, cultural materialism emerged in the late 1960s as a reaction to cultural relativism and idealism. At the time, much of anthropological thought was dominated by theorists who located culture change in human systems of thought rather than in material conditions (i.e. Durkheim and Levi-Strauss).
- Harris critiqued idealist and relativist perspectives which claimed that comparisons between cultures are non-productive and irrelevant because each culture is a product of its own dynamics. Marvin Harris argued that these approaches remove culture from its material base and place it solely within the minds of its people.
- With their strictly emic approach, Harris stated that idealists and relativists fail to be holistic, violating a principal tenet of anthropological research.
- By focusing on observable, measurable phenomena, cultural materialism presents an etic (viewed from outside of the target culture) perspective of society.

### Leading Figures

1. Marvin Harris (1927-) was educated at Columbia University where he received his Ph.D. in 1953. In 1968, Harris wrote *The Rise of Anthropological Theory* in which he lays out the foundations of cultural materialism (CM) and critically considers other major anthropological theories; this work drew significant criticism from proponents of other viewpoints.
  - Harris studied cultural evolution using a CM research strategy. His work with India's sacred cow ideology (1966) is seen by many as his most successful CM analysis.
  - In this work, Harris considers the taboo against cow consumption in India, demonstrating how economic and technological factors within the infrastructure affect the other two sectors of culture, resulting in superstructural ideology.
  - In this work, Harris shows the benefits of juxtaposing both etic and emic perspectives in demonstrating how various phenomena which appear non-adaptive are, in fact, adaptive.
  - Harris also made a concerted effort to write for a more general audience. His 1977 work *Cannibals and Kings: The Origins of Culture* laid out in CM terms the evolutionary



trajectories that lead to all features of human society (i.e., population growth, technological change, ecological change). This work also represents the point at which many believe Harris started placing too much emphasis on material conditions in explaining human society. Critics of Harris argued that his use of CM to explain all cultural phenomena was too simplistic and, as a result, many criticized and even dismissed his work

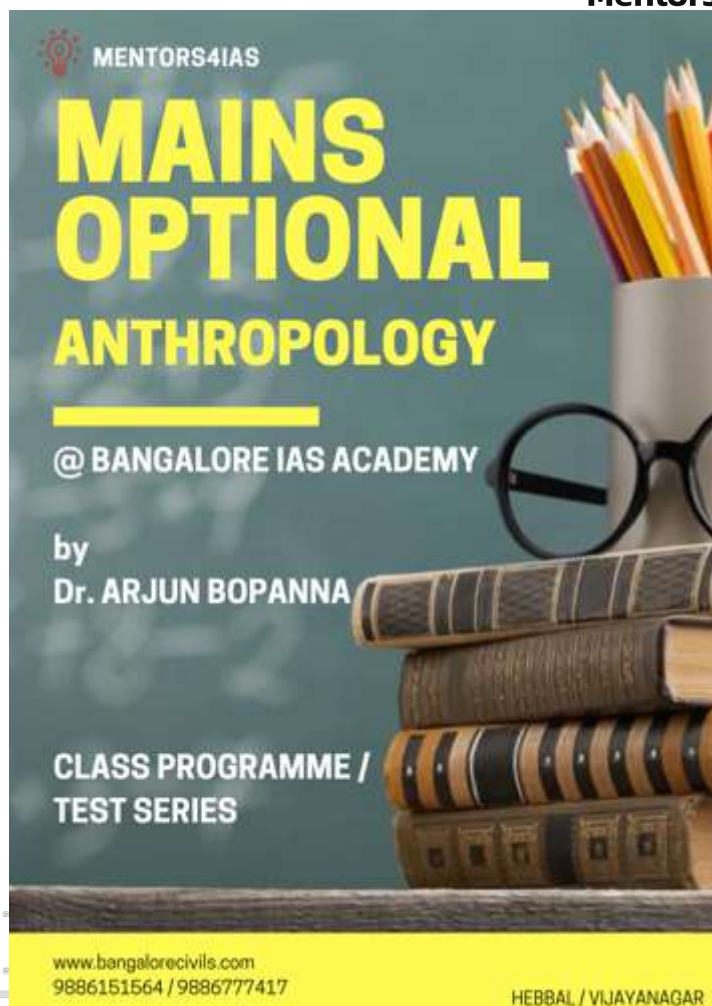
- In spite of his critics, Harris left a significant legacy having successfully created an anthropological theory and disseminated it to both students and the public. His work is widely cited by both proponents and critics of cultural materialism, and as of 1997, Harris' anthropological textbook *Culture, People, Nature* was in its seventh edition, attesting to the quality of his work

### Criticisms

- Cultural materialism has been termed “vulgar materialism” by Marxists because opponents believe that the cultural materialists empirical approach to culture change is too simple and straightforward
- Idealists such as structuralists (e.g., Durkheim and his followers) argue that the key to understanding culture change lies in the emic thoughts and behaviors of members of a native society. Thus, in contrast to cultural materialists, they argue that there is no need for an etic/emic distinction. To idealists, the etic view of culture is irrelevant and full of ethnocentrism
- Postmodernists also argue vehemently against cultural materialism because of its use of strict scientific method. Postmodernists believe that science is itself a culturally determined phenomenon that is affected by class, race and other structural and infrastructural variables

**Difficulty level: Easy**

**Mentors4ias test series: Test 3: Question 1 (d) Culture Materialism.**





1 (e) Relative dating

**Structure:**

- Define relative dating
- List the different methods
- Explain briefly few of them
- Give diagrams

**Supporting points:**

Relative dating fixes a time frame in relation to other strata or material and not in absolute dates in numbers. It can only define the antiquity in terms of older or younger than something else and makes it possible to arrange a series of things in proper chronological order. But it is difficult to know the total time span involved in the intervals between the things.

Some of the methods include:

**Stratigraphy -**

- Stratigraphy is the analysis of a series of layers that exist in the horizontal dimension, studied in the vertical time dimension.
- The method is based on the basic geological principle that among the layers, the earlier deposit lies under later deposit.
- Therefore, whenever a stratigraphic sequence is observed during the excavation of a site, relative ages of the cultural levels can be worked out..

**Typology -**

- An archaeological site mainly consists of artefacts and tools. The tools found in the site are classified on the basis of their form or shape and accordingly different categories or types are made.
- These are then arranged from simple to elaborate or from poorly preserved to well preserved or from crude to refine etc. Then a relative antiquity is derived based on the presumption that simple, poorly preserved and crude tools are earlier than the elaborate, well preserved and refined ones.
- According to Wheeler 'the values of typological classification are liable to be local rather than universal' but when the method is used in corroboration with stratigraphic method, it may become very helpful'.

**Sequence Dating -**

- In 1881 a relative dating method was developed by the great Egyptologist Sir Flinders Petrie in Egypt.
- The method is based on the fact that artefacts change in predictable ways through time. Among all other artefacts it is found that pottery changes with time frequently and a sequence of pottery design can thus be worked out.
- By detecting this trend of change, an archaeologist can trace associated cultural changes and make short term time distinction.
- While the excavation of grave was carried out in Egypt, Petrie found that the graves were associated with varied pottery. He analyse the features of pottery such as handles of pot and worked out a sequence showing their change, progressing from functional entities to mere decorations.
- The changes on pots were than correlated with other artefacts from graves and he finally ended with a series of numbered pottery stages that he labelled 'sequence dates'.





- This method was later on applied by the great anthropologist, Kroeber in determining the relative age of some sites in south western United States, Mexico and Peru.

**Cross Dating -**

- Cross dating involves the comparison of artefacts found in different stratigraphic levels. The method is based on the fact that the similar artefacts are approximately contemporary.
- The greater the similarity, the closer the ages. Certain artefacts like coins, pottery, arrowheads etc., which have limited occurrence in a given culture provide best sample for cross dating.
- When such type of objects are found in two different sites, according to cross dating sites are considered roughly the same age.

**Fluorine, Uranium, and Nitrogen analysis:**

- Prehistoric sites often consist of many bone remains. The basic principle of the method is that the longer a bone will be placed in soil, the more fluorine will be caught in and hence can suggest a relative date.
- All bones whether of animal or of human lying in the same level exhibit similar fluorine percentage in them. Therefore, if the quantity of fluorine remains same in both kinds of bone, it is sure that they belong to the same age.
- The bones acquired from a lower level show more fluorine in them whereas the bone remains coming from the upper level contains less fluorine. Relative ages of different bones at the same site thus can be established by measuring their fluorine contents.
- The method cannot provide an absolute age because the amount of fluorine differs from soil to soil, which gives a differential rate of absorption.
- Like fluorine, uranium or nitrogen content of the bones also can be measured. Since fluorine and uranium levels in the bone increase with time, while nitrogen decreases, such measurements help to place in sequence the cultural phases with which the different bones may be associated.
- In fact the analysis of fluorine, uranium or nitrogen is regarded as one of the very important technique for relative dating.

**Palaeontology -**

- Palaeontology, the study of fossilised remains of bones in archaeological sites also provide relative dates. The method is based on the fact that some animals migrate or become extinct with the change of climate.
- That is, climate has a direct relationship with the presence or absence of certain animals. For example, if evidence for *Elephas antiquus* (a forest elephant) is found, one can assume a temperate climate, while the presence of *E. primigenius* (a steppe elephant) indicates a steppes or tundra environment of almost glacial conditions.

**Palynology -**

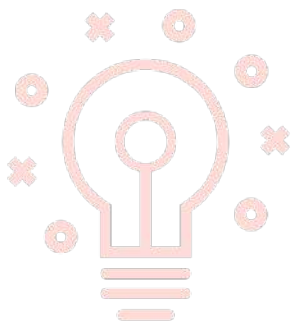
- Lennart Von Post, a Swedish Scientist, was the first to develop this palaeobotanical method in 1916.
- By this method a microscopic analysis of pollens extracted from trees are used to identify various trees and a pollen diagram is prepared.
- The pollen diagram in which relative frequencies of various species are plotted helps in tracing out the changing vegetation of an area.
- Acid peat or bog deposit is ideal sources of animal pollen, but dry sites, and clays contain enough pollen to provide a sequence. Pollens in soil underlying or overlying archaeological sites may be correlated with the already known regional pollen sequence and the age of the site thus can be dated.



**Patination -**

- It means chemical alteration of rock surfaces exposed to atmospheric conditions.
- The amount of patina on the stone is an index of its age valuable for relative placement of the stone artefact in the technological development.
- The chemical alterations of the stone are usually brought about by the action of iron oxides through time.
- The observation of the amount of patina on a stone may be used at sites where there is a long sequence and demonstrates that those tools which lie in the bottom level may have more patina than those in the upper levels.
- The different types of tools from the river gravels, terraces of rivers or lakes can be differentiated in the relative amounts of patina on the basis of which of the relative ages can be assigned on the artefacts.

**Difficulty level: Easy**



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## 2 (a) Discuss the evolutionary significance of bipedalism and erect posture.

### Structure:

- Brief introduction to Bipedalism (when and how)- 40-50 words
- Evolutionary significance: (130-150 words)
- Impact on physical evolution (50 words)
- Impact on cultural evolution. (50 words)

### Supporting points:

- Bipedalism allowed hominids to free their arms completely, enabling them to make and use tools efficiently, stretch for fruit in trees and use their hands for social display and communication.
- They could also see further over the savannah grass – but this also could have been a disadvantage since predators could probably spot them more easily.
- Bipedal hominids could spend more time foraging and scavenging out in the open savannah because their bodies would be exposed to less sunlight standing upright.
- Evolution Walk Bipedalism allowed hominids to free their arms, allowing the use of tools
- Walking on two limbs was also more energy efficient than walking on four – giving early hominids more energy to reproduce and therefore more chance of producing offspring bearing this unique trait.
- Even though bipedalism is slower at first, over long distances, it has allowed humans to outrun most other animals according to the endurance running hypothesis.

### Impact on Physical evolution:

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One of the things that makes our species unique is our exceptionally large brain relative to body size. A new analysis of the skull suggests that human brain evolution may have been shaped by changes in the female reproductive system that occurred when our ancestors stood upright. Bipedalism involved a major reconfiguration of the birth canal, which became significantly narrower because of a change in the structure of the pelvis. At around the same time, however, the brain had begun to expand. One adaptation that evolved to work around the problem was the emergence of openings in the skull called fontanelles. The anterior fontanelle enables the two frontal bones of the skull to slide past each other, much like the tectonic plates that make up the Earth's crust. This compresses the head during birth, facilitating its passage through the birth canal.

Similarly, standing upright would have led to big changes in what our ancestors saw, which may have led to an expansion of the visual areas at the back of the brain. The new findings suggest that further brain expansion, as well as reorganization of the prefrontal cortex, could have occurred as an indirect result of the pelvic modifications that followed the transition to bipedalism.

You can also write the impact of Bipedalism and Encephalization.... Check out our post in our website on the same. <http://mentors4ias.com/encephalisation-and-impact-on-our-diet-pattern/>

**Impact on cultural evolution:**

- Allowed manipulation of object- specialisation → tool tradition (→ pressure on brain → bigger brain)
- Big brain → birth of small baby → Dependence of infant on mother → in turn female dependence on Men → Institution like marriage and family
- Walking was more energy efficient → migrate long distance and occupy new area → growth of population.

**Difficulty level: Moderate****2 (b) How did Radcliffe-Brown and Levi-Strauss study kinship in terms of social structure?****Structure:**

- **Introduction: Historical background of Kinship studies in anthropology (30-40 words)**
- **Radcliffe Brown contribution to Kinship study**
- **Levi- strauss Contribution to Kinship study**
- **Analyze- difference in their approaches**

**Supporting points****Radcliffe-Brown:**

The English anthropologist A. R. Radcliffe-Brown (1881-1955) pioneered the study of social relations as integrated systems. His analyses of kinship relations in Australia and in Africa have had a powerful influence on modern social anthropology.

- This highly formal approach to the study of social customs led Radcliffe-Brown to a number of other famous analyses.
- His early survey of Western Australian aboriginal societies, for instance, led to the first sophisticated account of complicated aboriginal kinship systems as a set of variations on a few structural themes.
- He was able to identify a set of relationships between kinship terminologies and marriage rules that made sense for the first time of the "structure" of aboriginal society. These studies are still the cornerstone of the social anthropology of aboriginal Australia.
- In an early paper, "The Mother's Brother in South Africa, " published in 1924, Radcliffe-Brown made sense of what had been thought to be isolated and peculiar customs observed in African societies whereby a boy has a special relationship with his maternal uncle (his mother's brother) that is distinct from his relationship with any other uncle or with his own father.
- Again, by examining this relationship in light of the total abstract pattern of kinship relations and the pattern of relations between different social groups, Radcliffe-Brown was able to show the structural-functional "logic" of an apparently irrational custom.
- Radcliffe-Brown idea of social structures- studying social structures is not exactly the same thing as saying that we study social relations. Social structure - In the first place, its



regarded as a part of the social structure all social relations of person to person.

For example, the kinship structure of any society consists of a number of such dyadic relations, as between a father and son, or a mother's brother and his sister's son. In an Australian tribe the whole social structure is based on a network of such relations of person to person, established through genealogical connections. Secondly, the differentiation of individuals and of classes by their social role are included under social structure. The differential social positions of men and women, of chiefs and commoners, of employers and employees, are just as much determinants of social relations as belonging to different clans or different nations.

- A particular social relation between two persons exists only as part of a wide network of social relations, involving many other persons, and it is this network which I regard as the object of our investigations.
- In addition to identifying abstract relationships between social structures, Radcliffe-Brown argued for the importance of the notion of a 'total social structure', which is the sum total of social relations in a given social unit of analysis during a given period.
- The identification of 'functions' of social practices was supposed to be relative to this total social structure. Lévi-Strauss saw social structure as a mode
- Social phenomena constitute a distinct class of natural phenomena. They are all, in one way or another, connected with the existence of social structures, either being implied in or resulting from them.
- Social structures are just as real as are individual organisms. A complex organism is a collection of living cells and interstitial fluids arranged in a certain structure; and a living cell is similarly a structural arrangement of complex molecules. The physiological and psychological phenomena that we observe in the lives of organisms are not simply the result of the nature of the constituent molecules or atoms of which the organism is built up, but are the result of the structure in which they are united. So also the social phenomena which we observe in any human society are not the immediate result of the nature of individual human beings, but are the result of the social structure by which they are united.

#### Levis-Strauss:

- Levis- Strauss's concern in kinship studies was mainly with the understanding of the underlying relationships among the constituent elements in kinship.
- His search for 'deep structures' capable of revealing the workings of the Mind was seen in his analysis of the structural significance of ties of marriage and alliance, the ways in which they link descent units of various kinds.
- Claude Lévi-Strauss, *The Elementary Structures of Kinship* (1969) was a move from descent to alliance which redefined the study from kinship, and marriage in particular to a critical reevaluation of the entailments of descent and various dimensions of unilinear groups.
- *The Elementary Structures of Kinship* (1949),
  - begins with the premise that exogamy, the obligation to marry outside one's own group, is a corollary of the incest taboo, a defining criterion of "culture" as opposed to "nature."



- If complex kinship structures are characterized by negative rules—prohibitions on marrying certain categories of relatives—then elementary structures are defined by positive rules that indicate marriage with specific kinds of relatives.
- Bilateral cross-cousin marriage, in which a man marries either a father's sister's or a mother's brother's daughter, can be conceived of as a system of symmetrical exchange of women between two groups.
- Matrilateral cross-cousin marriage, where a man marries his mother's brother's daughter but never his father's sister's daughter, involves asymmetrical exchange, whereby a man takes a wife from one group and marries off his sister to another.
- Lévi-Strauss generated a model capable of expressing the apparently contradictory forms of behavior across cultures—a deep structure of avunculate expressions.
- Comparing the Trobriand Islanders and the Cherkess of the Caucasus, he found that “in both groups, the relation between the maternal uncle and nephew is to the relation between brother and sister as the relation between father and son is to that between husband and wife. Thus if we know one pair of relations then it is always possible to infer the other.”

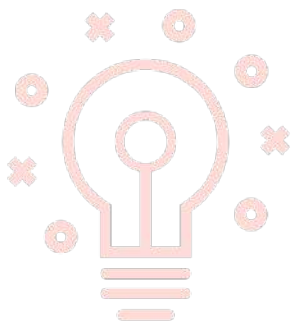
### Differences in their views

- Both Lévi-Strauss and Radcliffe-Brown wrote about the pronounced cross-cultural variations in the quality of the relationship between a son and his mother's brother.
- Radcliffe-Brown took the “elementary family” consisting of “a man and his wife and their child or children” to be the basic unit of kinship. The relationships among the members of this family were first order kinship relations, and those connecting family units were second-order relations. Lévi-Strauss believed this to be a fundamental misunderstanding.
- For Lévi-Strauss, the biological family was a term of the second order. The essential function of kinship was not the individual reproduction performed by the elementary family, but the establishment of relations between elementary families.
- Only by taking as the basic unit of kinship a configuration, including two pairs of correlative oppositions and each of the three types of familial relation (consanguinity, affinity, and descent) in each generation, does one have a meaningful structural unit, the building block of elaborate kinship systems. That is, it is only by drawing the relations between the pairs—brother/sister, husband/wife, father/son, mother's brother/sister's son—that the incest taboo, and the avunculate as its corollary, can be explained.
- While Lévi-Strauss (1958) claimed that social structure and the social relations that are its constituents are theoretical constructions used to model social life,
- Lévi-Strauss work *The Elementary Structures of Kinship* in 1943 offered a new approach to the study of kinship systems that has come to be **known as 'alliance theory'** in opposition to what is called 'descent theory', which was put forth by British anthropologists (such as A.R. Radcliffe-Brown, Meyer Fortes) and was the dominant theory in kinship studies till then. Lévi-Strauss's alliance theory brought marriage to the centre.



- The function of marriage was not just procreative. It was far more important, for it led to the building of a string of relations between groups, respectively called the 'wife-givers' and 'wife-takers'. In this context, the concept of incest taboo acquires a central place. For Lévi-Strauss, it is the 'cornerstone' of human society. The logical outcome of the prohibition of incest is a system of exchange. It is not only the negative aspect of the rule of incest taboo that needs to be recognised, as was the case with the descent theorists.
- What was significant to Lévi-Strauss was the positive aspect – it is not only that I do not marry my sister but I also give her in marriage to another man whose sister I then marry. 'Sister exchange' creates a 'federation' between exchanging groups.

**Difficulty level: Difficult**



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Breaking barriers to greatness





**2 (c) Elucidate Mesolithic culture and associated rock art with examples from India**

**Structure:**

- Time period and the environmental condition (30-40 words)
- Sites in India (30-40 words)
- General features of Mesolithic culture in India (Culture and tool technology) (100-100 words)
- Write about the rock art (80-100 words)
- Draw diagrams

**Supporting points-**

- The Mesolithic Age, also known as Middle Stone Age, was the second part of the Stone Age.
- In India, it spanned from **9,000 B.C. to 4,000 B.C.**
- Climate- glacial conditions had disappeared and dry period had set in.
- Carlleyle was the first person to discover microliths, rock paintings, pigment pieces with marks of grinding, human skeletons, animal bones, ash, and charcoal pieces in rock shelters in Mirzapur District of the Northwestern Provinces of Agra or Oudh (present Uttar Pradesh).
- Mesolithic sites are found almost all over India, except the northeast but including the Indo-Gangetic plains where stone, the raw material for making tools and weapons is scarce. This shows that Mesolithic hunter-gatherers had colonized the whole country. This had happened for the first time during the entire prehistoric period of two million years.

**The various sites of the Mesolithic period were located in –**

- Langhnaj in Gujarat,
- Bagor in Rajasthan,
- Sarai Nahar Rai, Chopani Mando, Mahdaha, and Damdama in Uttar Pradesh,
- Bhimbetka and Adamgarh in Madhya Pradesh,
- Karnataka- Sangana Kallu
- Teri group- Tamil Nadu Orissa
- Birbhanpur in Westbengal on Damodar river valley

**BRIEF DESCRIPTIONS OF MAJOR MESOLITHIC SITES OF INDIA**

- **Teri:** Teri sites are located on red-colored dunes, along the eastern coast of Tamil Nadu. These dunes were formed during the Terminal Phase of the Last Ice Age or Upper Pleistocene, when sea level had fallen several metres lower than the present one. Because of lowered sea level large areas were exposed along the coast, and sand





from exposed beaches was blown by wind and deposited along the coast. Hunter-gatherer groups occupied the surfaces of the dunes to exploit the marine resources of the shallow sea and vegetable resources of the trees and plants growing in the vicinity of the beach.

- **Sarai Nahar Rai:** The site of Sarai Nahar Rai is located in the plain of the Sai River, a tributary of the Gomati, in Pratapgarh district of Uttar Pradesh. The flat ground outside the village was used by the farmers for threshing of harvested crop by trampling under oxen hooves. Because of this activity over many years, stone artifacts, animal bones, and human skeletons buried below the surface got exposed and came to the notice of the village people.
- **Langhnaj:** The site of Langhnaj is located on one of the numerous sand dunes in Mehsana district of Gujarat. These dunes were formed during the hyper-arid climate of the Upper Pleistocene and were stabilized after the monsoon revived during the Terminal Pleistocene. The dunes form a rolling topography, and are clustered around a depression which gets filled by runoff from the dunes during the monsoon and retains till the next monsoon. It is a source of water for humans to wash their clothes and for livestock to drink and be bathed.
- **Bagor:** is a large village on the left bank of the Kothari River, a tributary of the Banas, 25 km west of the town of Bhilwara in Rajasthan. The prehistoric site lies on a large and prominent sand dune, locally known as Mahasati, on the left bank of the Kothari, a non-perennial river, about 1 km east of the village.

### Life and Culture in Mesolithic period

- Mesolithic or microlithic Age is part of the Holocene epoch. This age is characterized by the **appearance of Microliths** (small bladed stone tools). The Mesolithic Age was a transitional phase between the Paleolithic Age and the Neolithic Age. The people of this age **lived on hunting, fishing, and food gathering; later on they also domesticated animals.**
- Lot of environmental changes were also noticed during Mesolithic period. Rapid increase in atmospheric temperatures was noticed. Animals found in cold climates like mammoths, reindeers, woolly rhinoceros withdrew themselves or died. New species succeeded them.
- Change of climate forced people to change their diet. Mesolithic people diverted their attention to items like **fish, shell fish and water fowl.** Apart from food gathering, fishing and collecting were added. Though Upper Palaeolithic people invented bow and arrow for the first time, its material evidence was mostly found during the Mesolithic period.

### Tools of Mesolithic Era

The tools of Mesolithic Culture were characterized by –



- Parallel-sided blades taken out from prepared cores of such fine material as chert, chalcedony, crystal, jasper, carnelian, agate, etc.;
- Stone size (of tools) decreased;
- Tools were hafted in wood and bones;
- The size and shapes of the tools used as composite tools; and
- Some new tool-types namely lunates, trapezes, triangles, arrow-heads, etc. were developed.
- **Microliths were the characteristic tools of Mesolithic age.** These tools are small in size i.e., it measures only 3/16 inch or even less in size. Bow and arrow were invented and pottery were introduced.
- These microliths are tiny tools of one to five centimetres length, made by blunting one or more sides with steep retouch.
- The main tool types are backed blades, obliquely truncated blades, points, crescents, triangles and trapezes. Some of the microliths were used as components of spearheads, arrowheads, knives, sickles, harpoons and daggers. They were fitted into grooves in bone, wood and reed shafts and joined together by natural adhesives like gum and resin.
- Use of bow and arrows for hunting has been documented by Mesolithic man in rock art of that period.
- The Bored stones, which had already appeared during the upper Palaeolithic, became common during this, and the Neolithic and Chalcolithic periods. These are believed to have been used as weights in digging sticks and as net sinkers.
- Similarly, shallow querns and grinding stones also occur at several sites. These new technological elements led to enhanced efficiency in hunting, collection and processing of wild plant foods.

### Mesolithic Rock Art:

Rock Art is widely distributed in Northern, Western, Eastern and Southern part of India right from Ladakh, (J&K), Manipur and Himachal Pradesh to Tamil Nadu and Kerala. The most important Mesolithic rock art sites include **Bhimbetka, Adamgarh, and Pachmarhi, and many in the Jharkhand region.**

- This is primarily due to its unique geo-environmental set-up which favoured the evolution of early human culture on the Central Indian plateau. This is therefore that the mountainous region of the Vindhya and Satpura ranges which confine the Central Narmada Valley where Stone Age man flourished, have the largest number of rock art sites.
- The Vindhyan and Satpura ranges are fractured and elevated to such a way which produced natural shelters and caves of the Block Mountains. These shelters could easily be occupied by early hunter-gatherers and pastorals.
- Bhimbetka rock art shelters in the Vidhyan Range and the Adamgarh and Pachmarhi in the Satpura are among the most important rock art sites in India, beside the Daraki Chattan in Chhattisgarh and numerous in the Hazaribagh, Giridih and Kodarmada, Chatra region of the



Jharkhand several which have become fairly known in recent years through the efforts of Dr. (Colonel) A.K. Prasad.

- The paintings at Bhimbetka are found on the walls, ceiling and hollows in the shelters.
- They are made in red and white colours and less commonly in green, yellow and black colours derived from minerals in the rocks and earth.
- The paintings can be divided into two chronological stages: prehistoric and historic. The chief subjects of the prehistoric paintings are scenes of wild animals, hunting, trapping and fishing. Less common are depictions of daily life, dancing, singing, playing musical instruments, celebrating birth, and grieving sickness and death.
- In all these sites Hunting scenes predominate
- Based on the subject matter, colour, style, encrustation and superimposition, the rock art of India is in general classified in four broad developmental stages.
  - Stage 1 is represented by the hunters and gatherers in symbols/ petroglyphs bearing Palaeolithic to Mesolithic antiquity
  - Stage 2 depicts the hunters and gatherers in hunting and dancing scenes, in addition to the symbols and geometric designs of the Mesolithic period.
  - Stage 3 rock art depicts the settled agriculturist and animal keepers using pottery corresponding to the Neolithic/Chalcolithic period.
  - Stage 4 rock art represents the people of the early historic period.
- Among the zoomorphs, the horses and horse-riders predominate within the anthropomorphs in which figures of the archers and armed men/ warriors are quite frequent representing inter- ethnic or intra-ethnic struggles especially in the Central India.
- The dance-styles and certain rituals portrayed in the rock art find similarity with the contemporary regional tribal way of life.
- Hunters in groups armed with barbed spears pointed sticks, arrows, and bows.
- Trap and snares used to catch animals can be seen in some paintings.
- Animals painted in a naturalistic style and humans were depicted in a stylistic manner.
- Women are painted both in nude and clothed.
- Young and old equally find places in paintings.
- Community dances provide a common theme.
- Sort of family life can be seen in some paintings (woman, man, and children).

**Difficulty level: Moderate to difficult**

**Mentors4ias test series: Test 4: Question 6 (b) What the various sites of Mesolithic culture in India. Give a brief account of culture and tool technology.**




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**3 (a) Discuss social stratification according to any three major approaches.**


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**Structure:**

- Define and explain social stratification (40-50 words)
- **Approaches to social stratification: Explain each (170-190 words)- functionalism, conflict theory, and symbolic interactionism.**

**Supporting answers:**

- Social stratification is a process through which groups and social categories in societies are ranked as higher or lower to one another in terms of their relative position on the - scales of prestige, privileges, wealth and power.
- A distinction could be made between the criteria which place emphasis upon the ascribed or innate qualities with which the strata are relatively endowed and those which are acquired by the strata through their own achievement. **Ascription and achievement are, therefore, two types of scales which determine social stratification in all societies.**
- The bases or dimensions of social stratification refer to the different levels of differentiation which are made to allocate people in a given society. These can be listed as follows:
  1. Class: It refers to differentiation at the level of wealth. In this sense it can be termed as economic differentiation.
  2. Power: It refers to differential access to power in society. It includes political, social and other types of power
  3. Status: It refers to distribution of prestige or social honour.
- In most cases, the three dimensions complement each other.
- Social stratification is an aspect of the wider issue of social inequality. The existence of socially created inequalities is a feature of all known human societies, and, therefore, it is an important subject for sociologists and anthropologists to discuss.
- Broadly speaking, the following types of social stratification have been known to exist: i) the age-set system ii) slave system, iii) estate system, iv) caste system, v) class system, and vi) race/ethnic system.

**Approaches to study social stratification:**

Social stratification can be examined from different sociological perspectives—**functionalism, conflict theory, and symbolic interactionism.**

The functionalist perspective states that systems exist in society for good reasons. Conflict theorists observe that stratification promotes inequality, such as between rich business owners and poor workers. Symbolic interactionists examine stratification from a micro-level perspective. They observe how social standing affects people's everyday interactions and how the concept of "social class" is constructed and maintained through everyday interactions.

**Functional Approach**

- Differentiation based on division of work is considered an inevitable state of affairs in all human societies.
- One person obviously cannot perform all or most of the functions in a society. One has to depend upon other persons for some tasks, which one does not or cannot perform.



- Thus, for different functions, persons of different intent and ability are acquired. These by sheer differential, intent, ability and performance become different to each other.
- Their functions are valued differently. They are rewarded according to the values attached to their functions. It is this differential reward pattern which gives rise to stratification and hierarchy.

**Conflict Theory:**

- Conflict theorists are deeply critical of social stratification, asserting that it benefits only some people, not all of society.
- Stratification, conflict theorists believe, perpetuates inequality.
- Conflict theorists try to bring awareness to inequalities, such as how a rich society can have so many poor members.
- Many conflict theorists draw on the work of Karl Marx.
- During the nineteenth-century era of industrialization, Marx believed social stratification resulted from people’s relationship to production.
- People were divided by a single line: they either owned factories or worked in them.
- In Marx’s time, bourgeois capitalists owned high-producing businesses, factories, and land, as they still do today. Proletariats were the workers who performed the manual labor to produce goods.
- With such opposing interests, the two groups were divided by differences of wealth and power.
- According to conflict theorists, the resulting stratification creates class conflict.

**Symbolic Interactionism**

- Symbolic interactionism is a theory that uses everyday interactions of individuals to explain society as a whole.
- Symbolic interactionism examines stratification from a micro-level perspective.
- This analysis strives to explain how people’s social standing affects their everyday interactions.
- In most communities, people interact primarily with others who share the same social standing. It is precisely because of social stratification that people tend to live, work, and associate with others like themselves, people who share their same income level, educational background, or racial background, and even tastes in food, music, and clothing.
- The built-in system of social stratification groups people together.
- Symbolic interactionists also note that people’s appearance reflects their perceived social standing. Housing, clothing, and transportation indicate social status, as do hairstyles, taste in accessories, and personal style.

**Difficulty level: Moderate to Difficult**

**Mentors4ias test series: Test 5: Question 5 (a) Social stratification.**






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### 3 (b) "Europeans are closer to Neanderthals." Critically discuss in view of African origin of humankind.

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#### Structure:

- Explain the theory of Multiregional evolution of Human and its critical view
- Examine the new research that suggest similarity with European and Neanderthals
- Adaptive significance of the same

#### Supporting points:

**Background:** In 2010 researchers found out that Europeans are actually likely to be more closer to Neanderthal. In January 2014 an international team of leading archaeologists, geneticists, and anthropologists confirmed that humans outside Africa had bred with Neanderthals. Those of European and Asian ancestry have a very small but tangible presence of this now-extinct human in our lineage, up to around 4 percent of our DNA. People in Asia and Australia also bear traces of another known archaic human, the Denisovans. The discovery had important consequences. It raked up a controversial, somewhat marginalized scientific theory that had been doing the rounds a few decades earlier. In April 1992 an article had been published in Scientific American magazine with the incendiary title "**The Multiregional Evolution of Humans.**" The authors were Alan Thorne, an Australian anthropologist, and Milford Wolpoff, anthropologist based at the University of Michigan. They hypothesized that humans perhaps hadn't all come out of Africa. But this theory remains unproven. Academics in the West and in Africa today generally accept that humans became modern in Africa and then adapted to the environments where they happened to move to fairly recently in evolutionary time—these are only superficial adaptations, such as skin color.

#### **Europeans closer to Neanderthal:**

- Europeans may be closer to their Neanderthal cousins than previously thought, new research suggests.
- Breeding with Neanderthals has long been known to have left its traces in the DNA of modern Europeans. Scientists in Edinburgh have now confirmed that the genetic similarity between the two must have arisen after interbreeding in Europe and Asia, before our ancestors spread across the globe.
- Scientists have shown that the genetic similarity between Neanderthals and non-African modern human populations must have arisen after interbreeding in Europe and Asia
- Previous research speculated that modern Europeans and Asians are related to neanderthals because they originated from a similar sub-population in Africa.
- Both groups evolved from a common ancestor in Africa before spreading to other parts of the world.
- The two groups emerged at different times with neanderthals leaving the African continent more than 200,000 years before humans did.





- Now scientists at the University of Edinburgh and Wageningen University found the species mated in Europe and Asia thousands of years ago.
- The research involved dividing up the genetic code of each sub-species to calculate the statistical likelihood of distant or recent interbreeding. They traced the biological ties that exist between humans and the ancient species which are believed to have died out around 30,000 years ago.
- The research found that the two per cent of neanderthal DNA which exists in people today came from the mating outside of Africa.
- As well as revealing details of the shared history of humans and neanderthals, their research could be used to reconstruct the history of any species, including rare or extinct ones.
- Scientists said that modern Europeans share a number of genes involved in the build-up of certain types of fat with Neanderthals. The same genes were not seen in people from Asia and Africa, however.
- It is thought that ancient genes might have helped Europeans adapt better to colder climates, giving them an evolutionary advantage.

**Difficulty level: Difficult**

**ANTHROPOLOGY  
OPTIONAL  
BY  
DR ARJUN BOPANNA**




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**3 (c) Discuss briefly the major traditions in the Upper Paleolithic culture of Europe.**

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**Structure:**

- Brief introduction of Upper Palaeolith (20-30 words)
- Time period of European UP and its geographical extent (30-40 words)
- List the 5 major tradition (industries) and its brief characteristics (100-130 words)
- Draw diagrams

**Supporting points:**

Southwestern France is considered as the “classical region” in which all these Upper Palaeolithic developments are well preserved. The Upper Palaeolithic sequence of south-western France is used as a model for the Upper Palaeolithic cultural sequences because of the numerous well stratified sites.

The stone tool industries of the Upper Palaeolithic, in this classical region, show a great deal of regional variations and sub-regional successions, which cover a time span of 40,000 – 12,000 years Before Present (BP). These industries are:

1. Chatelperronian (35,000 – 29,000 years ago)
2. Aurignacian (34,000 – 29,000 years ago)
3. Gravettian (28,000 – 22,000 years ago)
4. Solutrean (21,000 – 19,000 years ago)
5. Magdalenian (18,000 – 12, 000 years ago)

**Chatelperronian:** Chatelperronian is the earliest industry of the Upper Palaeolithic in central and south-western France. The Chatelperronian culture is characterised by a stone tool called as the “backed point” or “backed knife”. It is a blade having one of its edges blunted for holding or hafting recalling a modern penknife blade. It is also called Chatelperronian knife. The other types of this culture are pointed blades, burins, scrapers and other kinds of flake tools. There are also bone awls, pierced teeth and bone pendants, but in general, bone tools are meager in the Chatelperronian.

**The Aurignacian culture:** The Aurignacian culture is named after the type site Aurignac in southern France. Aurignacian culture is recognised by some special artifact types. These types are “steep” and “nosed’ scrapers. The other types like different kinds of scrapers, backed blade tools, a variety of burins, and flake tools are also common. Aurignacian is characterised by the use of well made long narrow blades. Some of the earliest ivory carvings of animals and human figures begin to appear during this period. Even musical instruments made on bone such as whistles and flutes have been found at some sites.



**The Gravettian culture** is characterised by new technological innovations for survival in the cold climate. The stone tool industry is distinguished by a small pointed blade with one side blunted. This blunted side has a straight back. This is known as Gravette point. The Gravettian people were big game hunters. They used spear throwers for hunting. They were making nets and baskets. The Gravettian people are also known for their large skin tents, which were constructed over frameworks of mammoth bones, as a substitute for wood on the treeless steppes. Some of the Gravettian groups were dwelling in semi-permanent villages. Gravettian is known for Venus figurines. These are statuettes of women carved from stone, bone or ivory, or molded in clay and fired.

**Solutrean culture** is known after the type site Solutre in eastern France. The most striking tool-types are beautifully made, flat, bifacially worked “leaf-shaped points” often of superb craftsmanship. These are called “laurel leaf points” and “willow leaf points”. The other artifact types are barbed and tanged arrowheads, end scrapers, flint knives and saws. Bone and horn tools are also present. They hunted horse, reindeer, mammoth, cave lion, rhinoceros, bear and aurochs.

**Magdalenian culture.** The stone tools are a variety of backed blade tools, burins, scrapers, borers and projectile points. The Magdalenian is best known for its elaborately worked bone, antler and ivory tools and other objects which served both functional and aesthetic purposes. These tools include a fine series of elaborate harpoons, spear throwers, adzes, hammers, rods, and eyed needles which are beautifully decorated with carved or incised patterns, or representation of animals. Rock art in the form of cave paintings reached its zenith during the Magdalenian period. They hunted predominantly reindeer, and Magdalenian sites also contain extensive evidence of hunting other large mammals such as red deer, horse, bison and other large mammals.

**Difficulty level: Moderate to difficult.**





4 (a) With the reference to somatoscopic and morphometric characteristics commonly used for racial classification, make critical comments as to whether “Race” is a valid concept. (20 Marks)

**Structure:**

- Give a brief introduction to Race and the various criteria used for classifying race (50-60 words)
- What condition should be fulfilled for these criteria to be used for racial classification (40-50 words)
- How Race is an invalid concept- the modern interpretation (100-120 words)
- Conclusion- few lines from UNESCO declaration on race to justify your above statement (20-30 words)

**Supporting points:**

Race can be defined in a variety of ways depending on the context.

In terms of reproductive isolation → **Race is a group of population isolated to an extent that exchange of genes is absent or so slow that the difference is maintained**

This definition implies four features of a race.

- (1) Group of population
- (2) Genetic differences → the group of population forming a race have some genes in very high frequency & some low. Such differences occur due to chance & natural selection
- (3) Reproductively isolated → which maintains the genetic differences. But when they come in contact with other races, they set up new gene frequency.
- (4) Race is a biological concept It occurs only due to genetic differences, not due to any cultural superiority.

**Criteria used:**

- ✓ Somatoscopic/Morphoscopic / anthroposcopic: Skin colour, hair colour etc
- ✓ Morphometric /anthropometric: Cephalic index, nasal index etc

**Robert Boyd (1948 - )** suggested a few conditions which should be satisfied by criteria chosen for racial classification. The important requirements are as follows:

- (i) A criterion must be objective, so that different investigators do not show individual variation in identifying and classifying the concerned traits.
- (ii) A criterion should be non-adaptive, so that natural selection cannot play an effective role.
- (iii) A criterion should not be modified to a large extent by environmental factors.
- (iv) A criterion should not be subject to a high rate of mutation.
- (v) A criterion should be controlled by a known genetic mechanism (like follow Mendelian pattern.)

Because the somatoscopic and Morphometric criteria's do not fulfil the above criteria, it is not a valid concept.





### Race as a biological concept:

A race may be defined strictly in biological terms as a population of a species that different in the frequency of some gene or genes, from other population of the same species. Three important things have to be noted

- (1) It is arbitrary- there's no agreement as to how many genetic differences make a race.
- (2) The definition implies that any one race is not in exclusive possession of any particular gene or genes. **Hence no pure race is possible.**
- (3) Individuals of one race will not necessarily be distinguishable from those of another

As a device for understanding variation, biological concept of race has serious drawbacks because:

- It is arbitrary
- Increase Contact between population has reduced the difference
- Phenotypic traits can't be deciphered genetically
- Race exists as cultural category.

Thus anthropologists have been convinced race concept is of no particular utility. Instead they study the distribution & significance of specific genetically based characteristic or small breeding population.

### Racism: Race as a cultural concept:

Racism is a set of beliefs, ideology and social problem that advocates the superiority of certain races over others. It is rooted in the belief that all members of a race possess characteristics, ability & qualities which are specific to that race, so as to distinguish it as superior or inferior to another race. Further they view cultural differences between people as the result of genetically inherited traits & tendencies. It is culturally rooted, as recognizing another's race is what we learn when we grow up in a particular culture.

It leads to prejudice & discrimination against particular populations. Hence race used as a cultural concept gives rise to cultural bias and discrimination. Hence physical anthropologists are gradually abandoning the use of racial categories in studying human variation, as race can get ambiguous meanings when used as cultural term. culturally defined categories are not objective and cannot be translated into clear biological categories.

UNESCO made a declaration regarding the concept of race.

1. All human beings belong to one species- Homo Sapiens sapiens
2. Differences exist because of heredity or environment
3. Change in heredity is because of mutation or cross marriage
4. Race can't be grouped on basis of nationality, religion, geography, cultural or linguistic factor
5. Present day classification is based on anatomical difference & not on superiority
6. Intelligence has no role
7. Cultural differences have no role
8. Pure races don't exist
9. All humans are equal & deserve equal treatment.





In many societies, racist beliefs was need for political suppression of minority groups. Eg: Nazi racists ideology. However in anthropological terms Jewish race is not recognized. One cannot easily distinguish physical characters of the Jews from those of Nazis. The Jews form only a cultural group & a racially heterogenous group.

Anthropologists like R.C. Lewontin adopted a multivariate approach in examining the distribution of certain physical traits including skin colour & hair texture. Comparing the distribution of these traits to common divisions of race, he noted that traits used to identify races do not accurately reflect human variation. Only 6% variation totally is among difference races whereas 94% variation of physical traits is found within each race. Thus it unnecessary to follow raciation as human groups.

**Difficulty level: Moderate**

**Mentors4ias test series:**

**Test 3: Question 8 (a) What is the genetic basis of race? Describe the criteria used for racial classification.**

**Test 10 Question 8 (a) Race is biological and Racism is Cultural. Examine this statement.**

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#### 4 (b) Critically explain the anthropological approaches to religion.

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**Structure:**

- Define religion (30-40 words)
- Explain the different approach to study religion (150-200 words)
  - Evolutionary approach
  - Psychological approach
  - Functional approach
  - Structural approach
  - Others
- Mention the contribution of theorist under each

**Supporting points**

**Approaches to religion**

1. **Evolutionary approach :**

- E.B. Tylor, Primitive Culture (1871), that animism is the earliest and most basic religious form. Out of this evolved fetishism, belief in demons, polytheism, and, finally, monotheism is derived from the exaltation of a great god, such as the sky god, in a polytheistic context.
- Herbert Spencer advocated ancestor worship, a relatively similar system to Tylor's animism .
- R. Marrett (1909), on the other hand regarded animatism as beginning of religious ideas. As discussed earlier, his derivation is from ideas as mana (power), mulungu (supreme creator), orenda (magic power), concepts found in the Pacific, Africa, and America, respectively, referring to a supernatural power (a kind of supernatural



‘electricity’) that does not necessarily have the personal connotation of animistic entities and that becomes especially present in certain men, spirits, or natural objects. or

- Sir James Frazer human thought is best understood as a progression from magic to religion to science. Durkheim, evolutionary advancement consists in the emergence of specific, analytic, profane ideas about the ‘cause’ or ‘category’ or ‘relationship’ from diffuse, global, sacred images. These ‘collective representations,’ as he calls them, of the social order and its moral force included such sacra as ‘mana’, ‘totem’ and ‘god’

## 2. Psychological Approach

- After the evolutionary perspective, psychological approach to religion based on Sigmund Freud’s approaches of psychoanalysis and neurotic symptoms has become a dominant approach to understand religion in anthropology His thesis is that religious rituals and beliefs are homologous with neurotic symptoms (Eriksen, 1950). According to him, a deep subconscious psychological conflict within social groups is responsible for the development of religion Oedipus myth. The worship or respect shown to the totemic animal is the reflection of subconscious conflict between the son and father and the latter’s kinsmen. The psychological defence mechanisms involve projections to avoid conflict and reduce anxiety.
- Kardiner, who is considered as a neo-Freudian, sought to demonstrate that religious institutions of tribal people are projections of a “basic personality structures,” formed not by the action of an unconsciously remembered historical trauma but by the more observable traumas produced by child-training practices
- Ruth Benedict (1934) in her work has provided a background for all later culture personality studies using the same method. She explains cultural patterns of some American Indians in terms of configurations from certain personality types The psychological approach has been superseded by functionalist approach but recently the significance of psychology once again came to light in a different route as symbolic anthropology. The context is that there has been a considerable discussion on ‘primitive thought’ which is different from that of the ‘modern rational thought’. In this respect, the approach of Clifford Geertz to religion is significant, as modern or primitive religion can be understood in an integrated system of thought through symbolism In this respect, the approach of Clifford Geertz to religion is significant, as modern or primitive religion can be understood in an integrated system of thought through symbolism

## 3. Functionalist Approach

- The realm of the sacred is defined by the attitude people have towards it – rituals are sacred if they are performed with reverence and awe. Numerous functional aspects of religion include providing explanation or comfort; sanctions on social, economic and political norms and institutions; and aiding ecological adaptation and unifying the social group. Anthropologists like Malinowski, Evans-Pritchard, Radcliffe-Brown, etc., who approached religion from functionalist perspective provide explanation that satisfies human needs and solidarity of the group.



- Malinowski, for instance, in his work on the Trobriand Islanders emphasises on the close relationship between myth and ritual. He puts forward the idea of psychological functionalism, religious acts fulfilling the psychological need and satisfaction. A mortuary ritual, for instance, is intended to release the soul and prevent it from returning to haunt the living.
- Radcliffe-Brown (1922) provides an account of Andamanese religious beliefs and ceremonies. He asserts that the Andaman Islanders' main supernatural beings are spirits of the dead, associated with the sky, forest, and sea, and nature spirits, which are thought of as personifications of natural phenomena. Applying Durkheimian analysis he presents an organic picture of society; religion integrates society and rituals bring in solidarity of the group.
- In India M.N. Srinivas' (1952) study of society and religion among the Coorgs is an outstanding contribution to the study of religion in functionalist perspective. He very innovatively integrates social structure with religion which he finds it operating at different levels – local, regional, peninsular and all India. Drawing the difference between Indological and sociological approach, he adopts the latter for a meaningful treatment of religion in relation with the social structure of the Coorg. He demonstrates that various rituals organised at family, patrilineal joint family (okka), village and nad level bring in solidarity and unity among different social segments.

#### 4. **Structuralist Approach**

- Levi-Strauss' (1958) new "structuralism" posited a universal logical pattern to the human mind and in this perspective religion is of a totally different phenomenon in nature. He has been unwavering in his search for the universal structures of human thought and social life. He points out that although anthropologists have tried studying mythology it has not been successful as myths are still widely interpreted in conflicting ways: as collective dreams, as the outcome of a kind of esthetical play, or as the basis of ritual. Mythological figures are considered as personified abstractions, divinised heroes, or fallen gods The structural analysis of myth, which is a pioneering work of Levi-Strauss in anthropology, has influenced many scholars in the 21st century. Levi-Strauss contends that primitive religious systems are like all symbolic systems, fundamentally communication systems
- In Indian context Dumont (1959) takes the structuralist perspective of religion manifested in the worship of village deities. He finds the opposition between 'purity and 'impurity' and interdependency of both the values in the religious thoughts.

#### 5. **Marxist Approach**

- Karl Marx has been an influential theorist who was very critical of religion, and his approach depicts religion and religious belief as fictions that support the status quo and that maintained class differences.

#### 6. **Symbolic Approach**

- Evans-Pritchard (1956) first recognised the symbolic aspect of religion, and this has inspired several anthropologists to approach religion through symbols, the meanings given by the participants to the elements of religion and rituals, and interpretations that anthropologists can offer.



- Victor Turner (1967), Mary Douglas (1970) and Clifford Geertz (1973) are the important anthropologists that have contributed for our understanding of religion from symbolic perspective.
- Victor Turner's work on the Ndembu rituals provides a highly detailed and enormous work on Ndembu religious life which consists of rituals falling under these two categories – Life cycle crisis ritual and ritual of affliction. His work shows that the Ndembu society is greatly marked by different ceremonies replete with symbolic meanings in every act and performance. Along with that his powerful analytic concepts of 'structure' and 'anti-structure' in analysing the Ndembu society brought about new dimension in looking at rituals and its symbolic relevance in ritual context.
- According to Mary Douglas, the idea of the dangerous and powerful sacred is formed by living together and trying to coerce one another to conform to a moral idea. The sacred can be engraved in the hearts and mind of the worshippers in more than one way. It represents the society, as experienced; it is divine order, and what distorts it is unholy and polluting. Human body is the most appropriate symbol of the society; functioning of bodily parts represents the social order and disorder.
- Geertz proposes religion as the part of the cultural system. For him, a symbol means any object, act, event, quality or relation that serves as a vehicle for a conception. His conception of religion rests on the notion that people act basically according to the systems of meanings that they have and the job of anthropologist is to interpret these meanings and provide for their description.
- The functional and symbolic approaches have dominated the anthropological study of religion in the late twentieth century as researchers have become increasingly concerned with the concept of meaning. Biological, neurological and cognitive approaches, which have not been dealt here, are gradually gaining popularity and may dominate the future studies in anthropology of religion. In order to explain this universal phenomenon, the anthropologists offered various theoretical perspectives, and some of them considered include evolutionary, psychological, functional, structural, Marxist and symbolism. While all these frameworks attempt to explain religion in their own terms and tried to grasp the reality, no single framework explains everything.

**Difficulty level: Easy**

**Mentors4ias test series: Test 5: Question 3 (b) Write a note on various approaches to study religion.**





4 (c) Differentiate between transient and balanced genetic polymorphism. Illustrate your answer with suitable examples from human populations. (15 Marks)

**Structure:**

- Define Genetic polymorphism (20-30 words)
- Explain and differentiate between Transient and Balanced genetic polymorphism (50-60 words)
- Explain HbS and Sickle cell (60-70 words)
- Conclusion- Significance of GP in human evolution.

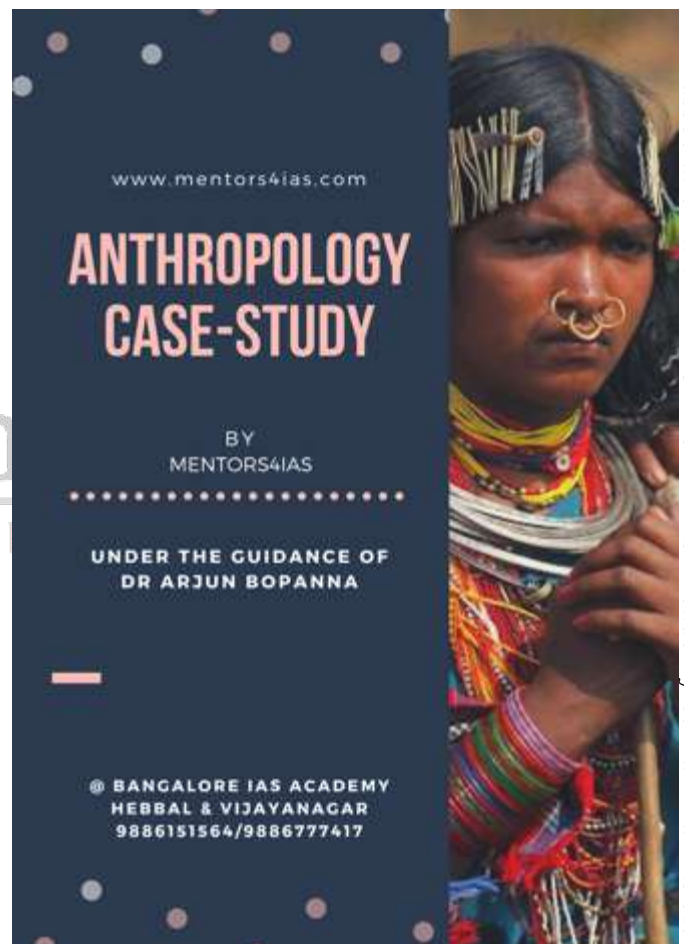
**Supporting points:**

**(1) Transient polymorphism & direction selection**

- ✓ when there is shift in population mean for some character due to direction of environment change
- ✓ Eg:- HbS in malaria effected areas

**(2) Balanced polymorphism & heterozygote selection/ superiority of heterozygotes-**

- ✓ Due to vigour of heterozygotes
- ✓ Ex:- sickle cell → homozygous is fatal but sickle cell trait is less fatal and it also provides advantage in malaria infected areas.
- ✓ In non-malarial environment the homozygote state of the sickle cell anaemia will have low fitness and as a result the allele gets lost in the population in due course of time. However, in malarial environment, Homozygote sickle cell anaemic individuals have the better fitness as equal to the normal homozygote individuals; as such both the alleles will be maintained in the population.



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**Difficulty level: Moderate**

**Mentors4ias test series: Test 3: Question 4 (a) What is genetic polymorphism? Examine the relationship between genetic polymorphism and natural selection.**





### 5 (a) Primate adaptive radiation

#### Structure:

- What is Adaptive radiation
- Give example- Draw a representative flowchart
- Why it occurs
- Significance in evolution

#### Supporting points:

- In evolutionary biology, adaptive radiation is a process in which organisms diversify rapidly from an ancestral species into a multitude of new forms, particularly when a change in the environment makes new resources available, creates new challenges, or opens new environmental niches
- Starting with a recent single ancestor, this process results in the speciation and phenotypic adaptation of an array of species exhibiting different morphological and physiological traits.
- Adaptive radiation replaces one ancestral form by several descendant forms. The ancestral form adapt to one type of environment but the descendent form adapt to diverse forms of environment.
- Explanation: Size of population increases -> its food, shelter and space reduces (ultimately inadequate) -> some members move to a new environment with less competition and more opportunities -> develop new adaptation à produce abundance of diverse species Thus it represents a series of alternative strategies that have arisen in response to inconsistent environment.
- Example- evolution of mammals into many distinct line- rodents, carnivores, hoofed animals, primates, whales, seals and sea cow, bats

#### Primate evolution

- While we have no primate fossil material prior to the Eocene Epoch, the first primates are thought to have evolved prior to the Paleocene Epoch (66–56 mya), possibly as far back as 90 mya, during the Late Cretaceous Period. With the extinction of the dinosaurs at the end of the Cretaceous, many terrestrial niches became available and predation pressures were somewhat relaxed.
- In addition, temperatures were higher than in the recent past and the angiosperms (flowering plants) were undergoing an adaptive radiation, i.e. relatively rapid speciation, and spreading globally. The spread of flowering plants resulted in an adaptive radiation of insect pollinators and herbivores (plant-eaters), as well as insectivorous and herbivorous arboreal vertebrates.
- The earliest primates likely descended from a small, nocturnal, insectivorous mammal. The tree shrews and colugos (also known as flying lemurs) are the closest living relatives to primates.
- The tree shrew is used as a living model for what the earliest primates, or primate predecessors, might have been like. At some point, primates or their ancestors moved into the trees and adapted to an arboreal environment.



- Two theories regarding the evolution of some primate characteristics, such as grasping or prehensile hands, forward-oriented eyes, and depth perception, are the Arboreal and Visual Predation Theories.
  - The Arboreal Theory posits that primate characteristics, such as grasping hands and feet and the presence of nails instead of claws, are the result of moving into and adapting to an arboreal environment.
  - The Visual Predation Theory asserts that characteristics that were well-suited to scurrying around in trees and visual features in particular, such as convergent orbits, are adaptations to insect predation. Grasping hands, visual acuity, and depth perception are essential for catching insects
- While primates are thought to have evolved in Asia, the majority of the early fossil material is found in North America and Europe, dating to the Eocene Epoch (~56–34 mya).
- They are divided into two superfamilies, Adapoidea and Omomyoidea.
  - In general, the adapoids were diurnal, lemur-like animals that are thought to be the ancestors of the strepsirrhine primates, i.e. the lemurs of Madagascar and the lorises of Africa and Southeast Asia (i.e. bushbabies and pottos of Africa and lorises of Southeast Asia)
  - The smaller, nocturnal omomyoids are good candidates for the ancestors of modern-day tarsiers. However, due to the early dates for ancestral tarsiers, it is possible that the omomyoids and tarsiers were sister lineages. During the Eocene Epoch, the early strepsirrhine-like primates experienced an adaptive radiation and expanded into numerous niches over a broad geographic area.
- The northern expansion of early primates into Europe and North America was possible because Eurasia and North America were joined as the large landmass known as Laurasia and, as mentioned, it was warm enough for tropical animals to move into northern latitudes.
- Due to subsequent global cooling, the early primates in North America and Europe eventually went extinct. Strepsirrhine primates spread into Africa after it docked with Laurasia. They are also hypothesized to have “rafted” on floating mats of vegetation to Madagascar, where they evolved into the great diversity of extinct and extant lemur species.
- By at least the late Eocene, the first anthropoid primates had evolved. There is debate over the origin of the anthropoids, i.e. the ancestor of the monkeys and apes. There are four different theories of our ancestry, each with its share of supporters: (1) adapoid, (2) omomyoid, (3) tarsier, or (4) independent origin as yet undiscovered.
- Remains of early anthropoids dating to the late Eocene are found in Africa and Asia. A possible stem or basal anthropoid, meaning the original ancestor of all monkeys and apes, comes from the Shanghuang deposits of China.
- Termed genus: Eosimias, it was as small as the smallest living anthropoid, the pygmy marmoset monkey of South America. Other late Eocene fossils have been discovered in Myanmar (genus: Pondaungia), Thailand (genus: Siamopithecus), Libya (genus: Biretia), Algeria, and the Fayum Beds of Egypt. During the Oligocene Epoch (~34–23 mya), the



anthropoid primates underwent a great adaptive radiation. The richest location for Oligocene anthropoid fossils is the Fayum Beds of Egypt.

- Oligocene anthropoids are divided into three families: Parapithecidae, Oligopithecidae, and Propliopithecidae, from most primitive to most derived over time. The New World monkeys are thought to have branched off from the parapithecids, with which they share some characteristics.
- Genus: Apidium is a prime contender for a possible ancestor. Once again, a rafting hypothesis is proposed for the migration of that ancestor from Africa to South America.
- The ancestors of the Old World monkeys and apes diverged from the family: Propliopithecidae. The propliopithecid, Aegyptopithecus zeuxis (also known as Propliopithecus zeuxis) is thought to be a common ancestor of the ape and Old World monkey lineages. While the earliest anthropoids were more monkey- than ape-like, the apes (or hominoids) were the first to successfully adapt to changing environmental conditions in Africa.
- During the Miocene Epoch (~23–5.3 mya), the adaptive radiation of the apes or hominoids can be observed in the fossil record. The earliest fossils are from Kenya and Uganda. There were 20 or more genera of apes during the Miocene and they exhibited a wide range of body sizes and adaptive strategies. Proconsul is a possible stem ape, dating to ~18 mya.
- The ancestry of the lesser apes is unclear but they are thought to have branched off 18–16 mya. The great apes diversified and spread from Africa to Asia and Europe. The ancestors of the orangutans, the sivapithecines, moved into western and subsequently eastern Asia. Remains in Turkey have been dated to 14 mya.
- The largest primate that ever lived, i.e. the now extinct genus: Gigantopithecus (known only from isolated dental and mandibular fragments), also had a sivapithecine ancestry.
- Dryopithecine apes moved into Europe during the late Miocene. Generally referred to as “dental apes,” due to the scanty remains of jaws and teeth, that evolutionary side branch eventually went extinct due to global cooling, as with the earlier strepsirrhines in the northern latitudes.
- While there were Old World monkeys in the Miocene Epoch, such as genus: Victoriapithecus from Kenya, the adaptive radiation of the Old World monkeys lagged behind the hominoids. However, the same environmental conditions that drove most ape genera to extinction in Africa led to an explosion of monkey species. Monkeys could more quickly adapt due to their shorter life stages and greater number of offspring.
- A baboon can give birth every two years versus four or five years for gorillas and chimps, respectively. While the leaf-eating ancestor of the colobines stayed in the trees, the ancestor of the cercopithecine or cheek pouch monkeys, such as macaques and baboons, adapted to traveling on the ground as well as in the trees.
- The ability to exploit both arboreal and terrestrial resources expanded their niche and they survived and thrived in Africa and Asia. With only two extant genera, the African colobines did not diversify to the same extent, having been confined to forests. However, the Asian colobines did not experience the same forest loss as their African cousins did and are thus much more diverse. When African forests later expanded, the ancestors of

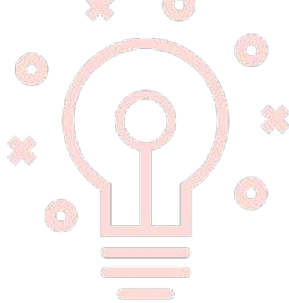


some cercopithecine species, such as the colorful arboreal guenons, went back to the trees.

- It has been difficult to trace the origin of the human/chimp/gorilla lineage during the mid-Miocene due to a paucity of fossils from that time and many conflicting viewpoints. Some of the contenders for the stem African great ape are Nakalipithecus (10 mya) and Samburupithecus (9.5 mya) from Kenya. Other possible ancestors or related species are Afropithecus (18–16 mya) and Nacholapithecus (15 mya) from Kenya and Otavipithecus (13 mya) from Namibia.
- The chimp and human lineages are thought to have diverged by the late Miocene. Global cooling in the latter part of the Miocene led to the extinction of all ape genera in northern latitudes. Forest cover in Africa was vastly reduced over time due to climatic fluctuations and while most apes went extinct, the newly emerged hominins thrived. Hominins experienced an adaptive radiation during the Pliocene Epoch (~5.3–2.6 mya), and late in the Pleistocene Epoch (~2.6 mya–11.7 kya) our own species, Homo sapiens, evolved ( $\leq 200$  kya).

**Difficulty level: Moderate**

**Mentors4ias test series: Test 4: Question 5(a) Adaptive radiation**



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### 5 (b) Implication of mutation in evolution

- Mutation is a change in DNA. There are many kinds of mutations, but here we focus on point mutations, or substitutions of one DNA base for another. Point mutations must occur in sex cells if they're to have evolutionary consequences. This is because, in order for evolutionary change to occur, the mutation must be passed on to offspring and eventually become more common in a population.
- Mutation, which changes the gene frequency are of 2 types : (a) non recurrent (b) Recurrent.
  - **Non –recurrent mutation** are rare and have little importance as they don't bring about detectable changes in the gene frequencies. They have little chance to survive in large population. Unless they have selective advantage. They Do not produce permanent change in the population. Changes in individual → equal chance of either to survive or to lose. Even those which survive has little effect on change in gene frequency and thus it is also taken as lost.
  - **Recurrent mutation** produces permanent change in population since the mutation arrive fresh in every generation and generate new genetic variability in every generation. In the large population the frequency of these mutation is never too low to be lost in sampling. Let us assume that wild gene is **A** and its mutant is 'a'. Further 'A' mutates to 'a' at U per generation and 'a' mutates to **A** gene at V per generation.
 

$$A \rightarrow a$$

$$a \rightarrow A$$
  - The changes in gene frequency depends on the mutation rate (U, V) both forward & backward and not on initial gene frequency. Such variation is the basic ingredient of evolution. The greater the genetic variation in a population the greater the raw material at the disposal of selection agents.
- Actually, except in microorganisms, it's rare for evolution to take place solely because of mutations.
- Mutation rates for any given trait are usually low. In large populations, mutations might be observed in 1 individual out of 10,000, but by themselves they would have no impact on allele frequencies.
- However, when mutation is combined with natural selection, evolutionary changes can occur more rapidly. It's important to remember that mutation is the **basic creative force in evolution**, because it's the only way to produce new genes (that is, variation). Its role in the production of variation is key to the first stage of the evolutionary process

**Difficulty level: Moderate**

**Source: Biological anthropology by Dr Arjun Bopanna**





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### 5(c) Olduvai gorge

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**Structure:**

- Location and archaeological time period
- Contributors
- Fossils
- Significance

**Supporting points**

- Olduvai Gorge is a site in Tanzania that holds the earliest evidence of the existence of human ancestors.
- Olduvai Gorge is an exceptionally rich archaeological site, preserving one of the best records of human history spanning nearly 2 Ma.
- Paleoanthropologists have found hundreds of fossilized bones and stone tools in the area dating back millions of years, leading them to conclude that humans evolved in Africa.
- Olduvai is a misspelling of Oldupai, a Maasai word for a wild sisal plant that grows in the area. The gorge is located in the Great Rift Valley, between the Ngorongoro Crater and the Serengeti National Park. It is 30 miles from Laetoli, another fossil-rich area.
- Olduvai Gorge was formed about 30,000 years ago, the result of aggressive geological activity and streams.
- The steep ravine is about 30 miles (48.2 km) long and 295 feet (89.9 meters) deep, not quite large enough to be classified as a canyon. A river cuts through several layers to form four individual beds, with the oldest estimated at about 2 million years old.
- The site has yielded abundant human and animal fossils and stone artifacts preserved in well-dated stratigraphic sequence. The quantity, quality, and geological context of paleontological and archaeological data provide a yardstick for rates of evolutionary changes in human form and stone tool technology.

**Fossils in olduvai**

- Over four hominin species, including the holotypes for Paranthropus “Australopithecus” boisei (Zinjanthropus) and Homo habilis, as well as remains of Homo erectus and prehistoric Homo sapiens have been discovered at the site (Leakey 1971).
- In 1930s, the Leakeys found stone tools in Olduvai and elsewhere. Among their most notable finds were several extinct vertebrates, including the 25-million-year-old Pronconsul primate, one of the first and few fossil ape skulls discovered.
- 1960s - discovered fossilized parts of a skull and upper teeth of a type of hominin that had not been previously identified. Over the next several weeks, the Leakeys uncovered about 400 pieces of a nearly complete skull. There were similarities to other discoveries, including those in South Africa by Raymond Dart in 1924 and by Robert Broom in 1936. However, the Leakeys classified their find as new category of hominin, dubbing it Zinjanthropus boisei.
- They dated the discovery as having lived 1.75 million years ago. This made it the oldest hominin discovered to that point, although a lack of fossil-dating technology made it difficult to determine the age of Dart’s and Broom’s earlier finds. The combination of the



works of the Leakeys, Dart and Broom made a convincing case that humans originally evolved in Africa.

- They uncovered a well-preserved fossil foot that had arches, giving credence to the theory that hominins walked upright.
- Also found another, smaller form of hominin that they called Homo habilis, translated as "handy human," because it seemed he was able to use tools. This fossil was dated at about 2 million years old.
- Another discovery of homo habilis in 1972 discovery also supported earlier theory that there were several lines of hominins developing simultaneously and that the Homo genus did not evolve from Australopithecus.

### Twiggy

- In 1968, a 1.8-million-year-old skull discovered in 1968 by Peter Nzube, who was part of the Leakey team. Nicknamed Twiggy, after the slim British model, the skull was flattened and had to be reconstructed from hundreds of fragments. Since her third set of molars had erupted, Twiggy was believed to have been an adult at death. However, the molars did not show much wear, so it is likely she had much time to use them.
- But the Leakeys were not responsible for what some scientists term the biggest and most significant findings at Olduvai Gorge. In 1986, a team of Tanzanian and American archeologists unearthed 302 bones and teeth belonging to a female that was determined to be about 1.8 million years old.

### Culture

- The hominin record is consistent with the evolution of stone tool technology from the Oldowan to Acheulean, Middle Stone Age, and Later Stone Age industries. The Oldowan industry (characterized by simple core-and-flake stone technology) is the earliest known human technology and was first discovered at
- Olduvai Gorge (Tanzania) is the site where the traditional view of the Oldowan-Acheulean transition was established. The aim of the recently launched Olduvai Geochronology and Archaeology Project is to tackle this question by conducting a comprehensive research program at Olduvai, based on the retrieval of fresh data derived from new laboratory and fieldwork research.
- The multidisciplinary character of this ongoing study is providing an integrative perspective to the analysis of the paleoecology, archaeology, geology and geochronology of the transition to the Acheulean at Olduvai. Using an innovative theoretical perspective that combines interests in cultural change, ecological adaptations, and biological evolution, and state-of-the-art methods in archaeology, geology and taphonomy, this project aims to make Olduvai one of the world's best references for the understanding of the evolutionary processes that led to the emergence of the Acheulean, the longest lasting culture in the history of humankind.

**Difficulty level: Difficult**



### 5(d) Anthropological inputs in facial reconstruction (10 Marks)

- Forensic anthropologists have also contributed substantially to the investigation of human rights abuses in all parts of the world by identifying victims and documenting the cause of their death. Among the best-known forensic anthropologists is Clyde Snow.
- Some of his work includes 1985 work in Brazil, where he identified the remains of the notorious Nazi war criminal Josef Mengele. He was also instrumental in establishing the first forensic team devoted to documenting cases of human rights abuses around the world. This began in 1984 when he went to Argentina at the request of a newly elected civilian government to help with the identification of remains of the desaparecidos, or “disappeared ones,” the 9,000 or more people who were eliminated by death squads during seven years of military rule.
- Today forensic anthropologists have become increasingly involved in the investigation of human rights abuses in all parts of the world  
‘They give Voices for the Dead’
- Facial reconstruction implies that the soft tissues of the face are reconstructed on the victims skull by a trained sculptor on the suggestions of a competent anthropologists.  
3 main aspects
  - Compare of skull with portrait of presumed deceased.
  - Compare of skull with photo of presumed deceased.
  - Actual restoration of head from skull.

#### Approach:

1. Reconstruction of soft parts, with clay/2d: Reconstruction of Soft parts of unknown as supposed to have looked in the life, either directly by means of 2d portrait/directly by clay. Does not always guarantee a precise picture, but anthropologists can provide relevant descriptions about an individuals physiognomy by explaining anatomic characters – nasal profile, shape of chin etc
2. Superimpose with outline of skull and picture: Superimposition is comparison of skull of an unknown with a picture of a suspect made in life by superimposition of an outline of skull, suitably scaled and oriented on an outline of the picture. Issue with this method → depends on the quality of photo, camera- subject distance, positioning, ageing etc.

#### Methods:

- a. comparison of facial morphology
- b. Photographic anthropometry
- c. Photo to Photo video superimposition

**Difficulty level: Easy**

**Source: Biological anthropology by Dr Arjun Bopanna**




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**5(e) Genetico-environmental factors affecting human growth. (10 Marks)**


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**Structure:**

- Define Growth and development
- Genetic factors effecting growth
- Environmental factors effecting growth

**Supporting points****FACTORS AFFECTING GROWTH AND DEVELOPMENT**

- The integrated nature of growth and maturation is largely maintained by a constant interaction of genes, hormones, nutrients and other factors. These factors also influence physical performance.
- Some are hereditary in origin. Others, such as season, dietary restriction, severe psychological stress, originate in the environment and simply affect the rate of growth at the time they are acting. Others again, such as socio-economic class, reflect a complicated mixture of hereditary and environmental influences and probably act throughout the whole period of growth.

**Genetic control-**

- The height, weight or body-build of a child or an adult always represents the resultant of both the genetical and environmental forces, together with their interaction. It is a long way from the possession of certain genes to the acquisition of a height of 2m. gene depends for its expression firstly on the internal environment created by all the other genes, and secondly on the external environment.
- The control of body size is certainly a complicated affair involving many genes, yet a disturbance in a single gene or group of genes may produce a widespread and drastic effect, as in the condition of **achondroplasia**, which is inherited as a simple dominant.
- On the other hand, the effects may be quite restricted and specific. The genetic control of dental maturation and eruption appears to be separate from that of skeletal maturation, and there is even evidence that the genes controlling the growth of different segments of the limbs are independent of each other.
- It is now believed that dental development and the sequence of ossification are primarily genetically controlled; the timing of ossification is partly influenced by genetic factors and partly by environmental ones.
- Maturation as a whole is even more affected by environment, but genetic influences are still detectable.
- It seems that the genetic materials operate throughout entire period of growth. Heredity influenced the rate of growth of early maturers or late maturers. Parent - offspring correlation in regard to height from birth to maturity for each are and sex has been reported.



- Chromosomal abnormalities suggest genetical control on growth. Genetic factors probably play the leading part in the difference between male and female patterns of growth.

**Environmental :**

1. Seasons

- Growth in height is on average fastest in spring and growth in weight fastest in autumn. This is true at all ages, including adolescence. The mechanism of the seasonal effect is not known; probably variations in hormone secretion are involved.
- Climate seems to have a very minor effect on overall rate of growth in man. It has been suggested that each major race of mankind varies in stature according to the climates in which they live. Seasonal variation in growth has also been observed in many studies. Longitudinal studies have shown that only about 30% of the children have cycles of increase and decrease in growth velocity which are strictly seasonal. The remaining children show accelerations and decelerations of growth which can not be clearly related with seasons.

2. Nutritional

- Growth is closely related with nutrition. A sufficiency of food is essential for normal growth. An adequate supply of calories is naturally essential for the normal growth of humans and the need varies with the phase of development.
- Nine different amino acids have been claimed to be essential for growth and absence of any one will result in disordered or stunted growth. Other factors are also essential for growth. For example, zinc plays a part in protein synthesis and is a constituent of certain enzymes; a deficiency of zinc causes stunting, interference with sexual development and falling out of hair. Iodine is needed for the manufacture of the thyroid hormones. Bone will not grow properly without an adequate supply of calcium, phosphorus and other inorganic constituents such as magnesium and manganese. Iron is required for the production of haemoglobin. Vitamins play an important part in growth. Vitamin A is thought to be control the activities of osteoblasts. In vitamin C deficiency the intercellular substance of bone is inadequately formed. Vitamin D deficiency is the cause of rickets.
- Malnutrition during childhood delays growth, and malnutrition in the years proceeding adolescence delays the appearance of the adolescent spurt.
- Growth studies have demonstrated that malnutrition may cause serious impairment of growth. The term malnutrition generally refers to the effects of an inadequate intake of calories or other major dietary components such as proteins. Malnutrition may also result from diseases which decrease the appetite or interfere with digestion and assimilation.
- A majority of 14 malnourished children fail to achieve their full genetic potential of body growth (both linear and ponderal) and are thus stunted or wasted or both.

3. Cultural

- The physical growth of human beings is definitely affected by cultural factors.





- Culture differs from ethnic group to ethnic group. The body growth differences correlate with varied cultural groups. The physical growth of the body follows some adaptations in different geographical areas of distribution of the groups.
4. Socioeconomic
- Socioeconomic influence on human growth is also a well known factor. Children from different socioeconomic levels differ in average body size at all ages that have been investigated.
  - The upper groups being always more advanced along the course to maturity. The cause of this socio - economic differential are probably multiple.
  - Nutrition is almost certainly one, and with it all the habits of regular meals, sleep, exercise and general organization that distinguish, from the point of view, a good home from a bad one.
  - Growth differences are more closely related to the home conditions than to the strictly economic status of the families and home conditions reflect the intelligence and personality of the parents.
  - Size of family exerts an indirect influence on the rate of growth. In a large family with limited income the children do not get proper nutrition. As a result the growth is affected.
  - The number of children in the family exerts an effect on the children's rate of growth. Children in large families have been shown to be usually smaller and lighter than children in small families. Possibly this is because in large families children tend to get less individual care and attention.

**LATEST SECULAR TREND (for additional reading)**

1. Increase in height and weight: Overall economic conditions of world has improved in last 100 years and there is found tendency for children to become progressively larger at all ages. The trend has been operating since last many years and in some well-off industrialized nations the trend has virtually stopped indicating that children of these societies have attained their full genetic potential.
2. Extent of increase: Similar increase in heights and weights of children throughout the world has been registered. It is indicated that there is average increase of 1 c.m. in height and 0.5 k.g. in weight per decade between 1880–1950 in the 5-7 years age group. For adolescent group, the same data increases to 2.5 c.m. and 7 k.g. per decade. It is, however, indicated that maximum average increase occurred in 2.5 years age group though there is only scanty data to prove the point. 15
3. Fate of Increase: This trend of increase in size is still continuing in many parts of the world such as many European and Asian countries. In Japan, this increase has taken a peculiar form. There is average increase in the leg length, though trunk length has remained the same. Thus, trunk to leg length is similar in both Japanese and Europeans, though the former mature earlier and are slightly short.

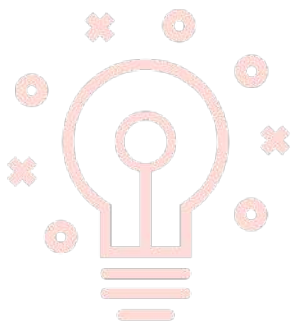


4. Earlier Age of Menarche: There has been rather a fast reduction in the age of menarche. Western European data indicate that it occurred earlier by about 4 months per decade between 1830-1960.
5. Out Marriage: Industrialization, urbanization with concomitant development of transport facilities has brought in high mobility and broken down the boundary of genetical isolates by increasing degree of out marriages. There has occurred a considerable hybridization of height genes. The postulate, however, considers that gene for greater height and gene for shorter height when placed together do not produce a height midway between the two but a height towards tallness. Though a conclusive proof is lacking, initial experiments do show that it is, indeed, so.

**Difficulty level: Easy**

**Mentors4ias test series: Test 3: Question 7(b) What are the various factors effecting growth and development**

**Source: Biological anthropology by Dr Arjun Bopanna.**



**Mentors4ias**  
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**Q6.a) Examine critically the contributions of Victor Turner and Clifford Geertz.**


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**Structure:**

1. Introduce symbolic anthropology
2. Its premises
3. Turners symbolic approach with example
4. Geertz interpretative approach
5. Significance

**Supporting points:****Basic Premises**

Symbolic anthropology studies the way people understand

- their surroundings,
- as well as the actions and utterances of the other members of their society.
- These interpretations form a shared cultural system of meaning—i.e., understandings
- shared, to varying degrees, among members of the same society

**Points of Reaction**

- In part, symbolic anthropology can be considered as a reaction to structuralism that was grounded in linguistics and semiotics and pioneered by Claude Levi-Strauss in anthropology. This dissatisfaction with structuralism can be seen in Geertz's article "The Cerebral Savage: On the Work of Claude Levi-Strauss." Levi-Strauss's focused on binary oppositions expressed by many and various aspects of culture and not on their separate meanings that are embedded in symbols was contested by the mostly American symbolic anthropologists. Structuralists downplayed the role of individual actors in their analyses, whereas symbolic anthropologists believed in "actor-centric" interpretations. Further, structuralism utilized symbols only with respect to their place in the "system" and not as an integral part of understanding the system. This split between the symbolic anthropologists and the structuralists dominated the 1960s and the 1970s.
- Symbolic anthropology was also a reaction against materialism and Marxism. Materialists define culture in terms of observable behavior patterns where "technoenvironmental factors are primary and causal". Symbolic anthropologists, instead, view culture in terms of symbols and mental constructs. The primary reaction against Marxism was its basis in historically specific Western assumptions about material and economic needs which, they alleged, cannot be properly applied to non-Western societies

**Object of study**

- Symbolic anthropology studies symbols and the processes, such as myth and ritual, by which humans assign meanings to these symbols to address fundamental questions about human social life. Traditionally, symbolic anthropology has focused on religion, cosmology, ritual activity, and expressive customs such as mythology and the performing arts. Symbolic anthropologists have also studied other forms of social organization such as kinship and political organization.



- Studying these types of social forms allows researchers to study the role of symbols in the everyday life of a group of people
  1. Clifford Geertz - humans are in need of symbolic “sources of illumination” to orient themselves with respect to the system of meaning that is any particular culture
  2. Victor Turner - states that symbols initiate social action and are “determinable influences inclining persons and groups to action”

Geertz’s position illustrates the interpretive approach to symbolic anthropology, while Turner’s illustrates the symbolic approach.

### Premises

- Symbolic anthropology views culture as an independent system of meaning deciphered by interpreting key symbols and rituals. There are two major premises governing symbolic anthropology. The first is that “beliefs, however unintelligible, become comprehensible when understood as part of a cultural system of meaning. The second major premise is that actions are guided by interpretation, allowing symbolism to aid in interpreting conceptual as well as material activities.

### Approaches and theorists

- As implied above, symbolic anthropology can be divided into two major approaches. One is associated with Clifford Geertz and the University of Chicago and the other with Victor W. Turner at Cornell. David Schneider was also a major figure in the development of symbolic anthropology, however he does not fall entirely within either of the above schools of thought.
- Interestingly, however, Turner, Geertz, and Schneider were together at the University of Chicago briefly in the 1970s). The major difference between the two schools lies in their respective influences.
  - Geertz was influenced largely by the sociologist Max Weber, and was concerned with the operations of “culture” rather than the ways in which symbols influence the social process. Geertz focused much more on the ways in which symbols relate to one another within culture and how individuals “see, feel, and think about the world”
  - Turner, influenced by Emile Durkheim, was concerned with the operations of “society” and the ways in which symbols function within it. Turner, reflecting his English roots, was much more interested in investigating whether symbols actually functioned within the social process the way symbolic anthropologists believed they did.

### Details

#### 1. Clifford Geertz (1926-2006)

- studied at Harvard University in the 1950s. In *The Interpretation of Culture* (1973), an enormously influential compilation of his essays, he argued that an analysis of culture should “not [be] an experimental science in search of law but an interpretive one in search of meaning”
- Culture is expressed by the external symbols that a society uses rather than being locked inside people’s heads. He defined culture as “an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic



forms by means of which men communicate, perpetuate, and develop their knowledge about and their attitudes toward life”

- Societies use these symbols to express their “worldview, value-orientation, ethos, [and other aspects of their culture]” For Geertz symbols are “vehicles of ‘culture’”, and he asserts that symbols should not be studied in and of themselves, but for what they can reveal about culture.
- Geertz’s main interest was manner in which symbols shape the ways that social actors see, feel, and think about the world. Throughout his writings, Geertz characterized culture as a social phenomenon and a shared system of intersubjective symbols and meanings

## 2. Victor Witter Turner (1920-1983)

- was the major figure in the other branch of symbolic anthropology. Born in Scotland, Turner was influenced early on by the structural-functionalist approach of British social anthropology. However, upon embarking on a study of the Ndembu in Africa, Turner’s focus shifted from economics and demography to ritual symbolism.
- Turner’s approach to symbols was very different from that of Geertz. Turner was not interested in symbols as vehicles of “culture”, rather he instead investigated symbols as “operators in the social process”
- Symbols “instigate social action” and exert “determinable influences inclining persons and groups to action” Turner felt that these “operators,” by their arrangement and context, produce “social transformations” which tie the people in a society to the society’s norms, resolve conflict, and aid in changing the status of the actors



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**Difficulty level: Moderate**

**Mentors4ias test series: Test 6: Question 4(c) Explain the contribution of Turner and Geertz in symbolic theories of anthropology. 15 marks**





**6 (b) "Human adaptations are always bio-cultural in nature." Discuss with reference to human adaptation to high-altitude climate. (15 Marks)**

**Structure**

1. Describe biocultural adaptation
2. Discuss about biocultural feedback mechanism
3. Briefly describe the stresses in high altitude
4. Discuss biological response and cultural response leading and stimulating each other
5. Explain with examples

**Supporting points**

- Archaeological evidence suggests hunter-gatherers occupied the Tibetan plateau some 25,000 to 20,000 years ago. People began moving into the Andean Altiplano around 11,500 to 11,000 years ago. What motivated prehistoric people to move into the harsh and challenging conditions presented by high altitude?
- The highlands offered an attractive option with a landscape that was open and pristine. People probably started out moving up and down for short terms, and then gradually settled at the higher elevations. Changing environmental conditions also created "new opportunities and new constraints."
- Archaeological data suggest that Neolithic agricultural groups living on the northeast margins of the Tibetan Plateau expanded to the altitudinal limits of their farming systems by 5200 cal BP, but also to the limits of human physiological capacity for high elevation (at ~2500 m above sea level).
- With the introduction of novel, exotic domesticates (namely barley, wheat, and sheep), Neolithic agriculturalists started to push these limits, and in roughly 1600 years (by 3600 cal BP) small groups of people were living at higher elevations and deeper into the Tibetan Plateau. **This required and encouraged novel cultural solutions to high elevation settings, but also imposed heavy selective pressure on the physiological capacity for low oxygen environments.**
- These new cultural capacities enabled people to move into a stronger environment of selection (above 2500 m above sea level) that favored the physiological capacities for life at high elevation, which in turn became more common across these populations.
- This hypothesis about bio-cultural evolution is testable with a combination of high-resolution archaeological evidence and high throughput sequencing of datable prehistoric human DNA.

**Stress**

- Life at high altitudes imposes a **complex ecological stress** of low barometric pressure (which acts by lowering the oxygen and carbon- dioxide pressure in the inspired air), cold , low moisture (humidity) content of the air, wind, intense solar radiation and reduced nutritional base. In addition, the rough terrain imposes higher muscular activity.
- Of these, hypoxia exerts greater degree of stress on physiological functions and is not easily modified by cultural behavioural practices or responses. Hypoxia results from a decrease in partial pressure of oxygen in atmosphere proportionally to increase in the attitude. This has the following effect on our body:
  - ✓ Leads to reduction in O2 Hemoglobin saturation. It interferes with the oxygen acquisition at the cardiopulmonary level and utilisation by the cells.



- ✓ Hypoxia induced anorexia and dehydration due to increased ventilation and low humidity at high altitude leading to weight loss.
- ✓ The multifaceted effect of hypoxia also manifests through increased rates of infant mortality, miscarriage and prematurity among people residing at higher elevation.
- ✓ Decreased foetal growth due to impaired maternal foetal oxygen transportation also results into birth of low birth weight babies.

**Immediate Responses: biological response**

- a) The immediate response to lack of oxygen (hypoxia) is an increase in the volume of air respired per minute. This is brought about by rapid and deeper respirations.
- b) There is augmented heart rate and cardiac output (Heart rate reduces to normal sea level followed by reduced cardiac output on acclimatization)
- c) Further Exposure to hypoxia favors increase in red blood cell and consequently hemoglobin concentration, enhancing oxygen carrying capacity of blood. There is linear relation between hemoglobin (Hb) and barometric pressure. Upto 3500m it rises steeply. Augmented viscosity accompanying polycythemia contributes to increased pulmonary arterial pressure. This enhances effective blood gas interfacial area of alveoli and diffusing capacity of lung which permit effective arterial blood oxygenation.
- d) At 4500m acclimatisation takes place in approximately 10 days.

Thus, acclimatisation to high altitude hypoxia is a complex phenomenon that develops through the modification and synchronized interdependence of the respiratory, circulatory and cardio vascular system to improve oxygen delivery and utilisation. The increased ventilation leads to the 'washing out' of carbon dioxide from the air passages and consequently from the blood. This loss of carbon dioxide alters the homeostatically controlled acid base balance of the body to a more alkaline level termed 'alkalosis'. This inhibit the stimulus for increased ventilation, which is counteracted by excretion of alkaline urine (bicarbonate ions) by kidney thereby shifts pH of blood to normal level.

**Cultural adaptation** - Clothing, shelter, and heating arrangements are generally effective in protecting against extreme cold climate of high altitude.

- The ability to survive in **such harsh environments required control of fire, an expanded tool kit that included bone needles to make complicated clothing that protected the body in a significant way, and the cultural flexibility to change subsistence practices.**
- High-altitude residents employ cultural practices that modify environmental stressors and thus condition biological responses. **Indigenous cultural practices affecting food sources, energy expenditure, and population movement** provide examples of the ways in which such conditioning takes place.
- Energy or food consumption- Plants and animals genetically adapted to high-altitude environments traditionally have been relied upon as food sources.
  - In Tibet, barley is the staple, with green vegetables being added in the summer and dried vegetables and root crops such as potatoes and turnips eaten in the winter
  - Andean staples consist of numerous tubers (over 2,500 kinds of kinds of potato, ulloco, oca, mashua), quinoa, and other grains (kiwicha, tarwi, canihua) (Richardson, 1994).
  - The Quechua practice of freeze-drying potatoes (chun~ o) and meats (charqui) preserves them for long periods and reduces their weight, facilitating transport by groups using widely dispersed resources (Thomas, 1976).



- Other crops (peanuts, beans, fruits, and coca) from low-altitude regions supplement the Andean diet and, in the case of coca, have nutritional as well as narcotic effects (Richardson, 1994).
- Animals indigenous to the high-altitude environment—the llama and guinea pig of the Andes and the yak of the Himalayas—are efficient producers of food, clothing, and fuel.
  - The llama and yak particularly have multiple uses, being a source of transport, meat wool, rope, leather, dung for fuel and fertilizer, and, in the case of the yak, milk for butter, cheese, and yogurt as well as labor for pulling the plow.
- Exchange of resources between altitudes plays an important part in high-altitude regions. In the Andes, an extensive network of Inca roads or wide footpaths links the highland and lowland areas. This network has been joined more recently by highways, railroads, and air travel.
  - Animal resources (wool, hides, meat) from the Andean altiplano are exchanged for wheat and other foods grown at lower elevations (Thomas, Moore et al. 1976).
  - In Tibet, most exchange of crops and animal products occurs between farmers and pastoralists within a region (Kolsteren et al., 1990).
  - Between regions, trade routes and relationships between monasteries served historically to move products over longer distances. Until the 1950s, nearly all trade was by foot or pack animal, as wheeled vehicles were prohibited by Buddhist beliefs and railroads have yet to penetrate the Tibetan plateau. Recently, highways and air travel have linked the Tibetan plateau with lowland regions.
- Exchanges within households are important in the production and consumption of resources. In traditional subsistence economies, food is generally produced by adults and adolescents and distributed to the young and older-aged members of the household. This pattern serves to minimize seasonal change in caloric consumption.
  - For example, in rural highland Peru, preharvest household caloric consumption was less than half that present postharvest (Leonard and Thomas, 1989).
  - However, preferential distribution of food to children, the reduction of household consumption by changes to less energy-intensive activities, and the temporary out-migration of adolescent and adult males protected children from seasonal shortages (Leonard, 1991).
  - The use of children or adolescents in herding serves to reduce household caloric consumption, since a 12-year-old child can complete the herding work of an adult with 30% fewer calories (Thomas, 1976). In the Lhasa valley, men and women eat the same kinds and generally the same amounts of food.
  - The relationship of food need to energy expenditure is recognized by Tibetan farmers; those who do the most work eat the most regardless of sex (Kolsteren et al., 1990).
- Conservation of energy is accomplished by the use of housing and clothing with properties that minimize heat loss and maximize heat gain.
  - Houses made of adobe, thick mortared stone, or sod bricks on the Andean and the Himalayan plateaus have insulating value and effectively store radiant heat gained during the almost universally sunny days.
  - Houses of piled stone construction provide little buffering against cold but represent a lesser energy and resource investment for mobile pastoralist families in both locations.



- Clothing creates a warm, portable living environment, typically consisting of multiple layers of insulating fiber (usually wool).
  - The outer layer is often dark, tightly woven, and water-resistant and serves to maximize solar heat absorption and prevent convective heat loss.
  - Covering for the head and face provides shielding and helps maintain a warmed, humidified microenvironment around the face.
  - The limited availability of wood or other fuel for heating houses makes the strategy of fully clothed family members sleeping together an important means of conserving body temperature without increased expenditure of caloric energy or fuel resources (Hanna, 1976).
- Specific cultural practices afford additional protection from environmental stresses around periods of vulnerability in the life cycle.
  - For example, in both Peru and Tibet, the infant or young child sleeps with the mother in the early months of life, is nursed in the warmest location, remains swaddled even while indoors, and is placed in the sunniest areas when outside.
  - The infant is wrapped in multiple layers—diapering, leggings, an inner garment, and sweater—and wears a knitted hat (Baker, 1976; Niermeyer, unpublished observations).
  - In Tibet, infants are carried inside the traditional outer garment (chuba) so nursing can occur within protective layers of clothing.
  - Quechua and Aymara women in the Andes carry their infants using a carrying cloth or manta worn across the mother's back and fully enclosing the infant, who is also encased in a blanket and swaddled by a cloth belt.
  - The insulating value of this manta pouch is sufficient to raise relative humidity and temperature 12°C from the first layer of the pouch to the infant's skin but inspired PO<sub>2</sub> is 8–16 mmHg below ambient (Tronick et al., 1994).
  - The adoption of Western-style dress by mothers in the Lhasa valley appears associated with a higher incidence of cold injury in their infants, suggesting that the abandonment of long-standing clothing and carrying practices is maladaptive (Niermeyer, unpublished observations).
- Another example of a cultural practice which affords protection from the high altitude environment is permanent or temporary out-migration, perhaps the ultimate behavioral solution to an environmental problem.
  - Such practices were recorded in the Andes by the seventeenth-century historian Antonio de la Calancha, who observed that pregnant women of Spanish origin descended to give birth at lower altitudes and did not return until the child was more than a year old (Monge, 1948).
  - A similar practice occurs today among pregnant Han women in Tibet, who typically descend to their home districts at or near sea level and remain there or leave their infants with extended family until the infant is approximately 2 years of age (Niermeyer et al., 1995).
  - Colorado high-altitude residents also illustrate this pattern, moving to lower altitudes after age 55 in order to alleviate symptoms of heart and/or lung disease (Regensteiner and Moore, 1985).



- In summary, high-altitude residents engage in cultural practices that lessen the effects of hypoxia for limiting energy availability in the high-altitude environment.

**Long term Adaptation in Highlanders: biological**

- a) Increase in number of capillaries: the PO<sub>2</sub> of O<sub>2</sub> is as such less. So increase in number of capillaries will shorten the distance of travel.
  - b) Increase in pulmonary ventilation: This is achieved by
    - by increase in lung volume (leading to large chest) (Increased pulmonary arterial pressure is associated with right ventricular hypertrophy indicating increased workload characteristic of native population)
    - by high residual lung volume.
      - This is a developmental adjustment during childhood by increase in number of alveoli and surface area. The earlier the age or the longer the duration of stay at high altitude, the greater the environmental influence on body dimensions and respiratory functions. The altitude natives Anedean Indians have larger chests and greater lung capacity as well as more surface areas in the capillaries of lungs which facilitate the transfer of oxygen to the blood. The Spitians who inhabit high altitudes in the North West Himalayas showed large chest size in relation to stature indicating developmental adaptation to low oxygen pressure of high altitude. The larger chest circumference of the Bods of Ladakh as compared to lowland Indians also suggests a structural response to the greater lung function capacity and adaptation to high altitude hypoxia (Kapoor & Kapoor, 2005).
- Polycythaemia: Developmental response during neonatal life due to stimulation o bone marrow. Increase in RBC and reduction in Plasma → more oxygen being carried
  - Increase work capacity due to efficient use of O<sub>2</sub> (Athletes who are well trained are also found to be equally able)
  - Increase adult work capacity in children born in high altitude.
  - Effect on reproduction:
    - Low birth weight babies → so that enough O<sub>2</sub> given without affecting mother,
    - High postnatal deaths
    - Growth rate and development of children slow due to more demand from chest & bone marrow
    - Maturation also delayed till 16 years.

**Difficulty level: Easy to Moderate**

**Source: Biological anthropology by Dr Arjun Bopanna.**






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**6 (c) Discuss the methods of studying human growth with their merits and demerits. (15 Marks)**

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**Structure**

Direct question. Discuss the methods along with merits and demerits

**Supporting points**

There are some different methods of studying growth and development. Some important methods are as follows ----

1. Cross - sectional method
2. Longitudinal Method
3. Mixed longitudinal method
4. Extended longitudinal method

**1. Cross - sectional method:**

- In this method the study is completed by observing and measuring different individuals at different phases of their growth, each individual being measured once only, and all the children at age 8, for example, are different from those at age 7.
- Cross – sectional methods are adequate for studying distributions of various measurements in different individuals at different ages and for constructing standards of growth attained, e. g. height and weight standards.
- In case we are interested in the study of pattern of growth of children between 6 to 10 years of age then for each age level we require a sample of say 100 children belonging to 6 years, another 100 belonging to 7 years and so on upto 10 years.
- The selected measurements are then to be taken for each child who is thus measured only once. This method effectively enabled us to estimate the mean value of any given measurement and also to measure the variation about this mean.
- This is the most popular method used extensively for working out the population standards and growth charts, particularly for clinical purposes.
- Cross - sectional method is the best for the estimation of population mean at successive age levels. This is due to the fact that samples at each age in a longitudinal study are not independent of each other because the children are the same.
- Therefore, cross-sectional method is the best method for setting up population standards, describing the mean and variation in height, weight or any other parameter in children at different age levels.
- Moreover, in this method it is possible to measure a large and representative sample for each age group in a short time. Cross - sectional surveys are obviously cheaper and quicker and can include much larger numbers of individuals.
- Analysis of such data tells us a good deal about the distance curve of growth that is about height attained at a particular age. On the basis of such data standards of height and weight of a particular population can be fruitfully constructed.
- The mean age of reaching a particular maturational stage such as menarche, or the first appearance of pubic hair, or the eruption of a particular tooth, can also be estimated through cross-sectional surveys. Cross - sectional methods are also



obligatory in circumstances where continuity is not possible, e. g. – autopsy studies on internal organ.

## 2. Longitudinal Method :

- It is the method of studies growth by observing and measuring the same individual for a variable period, during his/her growth.
- In longitudinal study each child is measured at each age and therefore, all the children at age 8 are the same as those at age 7. A longitudinal study may extend over any number of years.
- There are short term longitudinal studies which may cover a couple of years, and a full birth to maturity in which children may be examined once, twice, or more times every year from birth till 20 years.
- In this approach measurements are repeatedly done on the same individual or group or individuals at definite age intervals. This is the best way to study the growth of any individual child. It is necessary that the measurements must be correct and accurate. Thus, at the end of a longitudinal study we have a series of measurements for each individual at different age levels.
- On the basis of these measurements a graph can be plotted for each measurement separately e.g. stature against age for each subject. The graphs obtained in this manner are actually the “distance curves”. If a number of normal 20 individuals have been repeatedly measured and “distance curves” drawn then similarity in their shapes suggests the pattern of the growth in the stature of the child.
- The “distance curves”, however, do not indicate as to how quickly the child grows or how slowly he/she grows. Longitudinal data are greatly preferable for estimating mean velocities of growth.
- In estimating the variability of the velocity from one year to another longitudinal data are absolutely necessary. Longitudinal studies give correct information on individual variations in the rate of growth, timing of particular stages etc.
- Longitudinal studies by their nature are costly, laborious and time-consuming. It depends upon the continuous cooperation of the subjects.
- In practice it is always not possible to measure the same child at the desired times, because of various reasons. For example, the child may not be available at that time, may leave that place etc.
- Longitudinal studies are more difficult than the cross-sectional method, since it involves repeated examinations over a period of years.
- However, the longitudinal data are essential for the study of growth. It must be admitted that to understand certain basic facts of growth longitudinal studies are unavailable.

## 3. Mixed longitudinal method :

- In practice of longitudinal studies when it is impossible to measure exactly the same group of children every year for a prolonged period. Inevitably some children leave the study, and others, if that is desired, join it.
- A study in which this happens is called a mixed longitudinal study. A study will have records that are longitudinal over 2 years for quite a large proportion of its children,



over 3 years for a smaller proportion, and over 10 years for a smaller proportion still, perhaps none.

- It is convenient to refer such data, where some of the children are measured at least twice but some fail to last the specified period and others enter for the first time during it.
- In this study special statistical techniques are needed to get the maximum information out of its data.
- This type of studies is more complicated. Mixed longitudinal study is applied to a study in which some of the individuals have been measured on at least two successive occasions but have not been present throughout the period of study.
- One particular type of mixed study is that in which a number of relatively short-term longitudinal groups are overlapped. Thus one might have groups of ages 0 to 6, 5 to 11, 10 to 16 and 15 to 20 years to cover the whole age range.
- However problems arise at the 'joins' unless the sampling has been remarkably good.
- In a mixed longitudinal study the best estimates of mean distance, velocities and accelerations with their standard deviations are made from both the longitudinal and cross sectional elements combined, using Patterson's formulae adapted for growth work by Tanner in 1951.
- Mixed longitudinal study is somewhat laborious unless a computer is available

#### 4. Extended longitudinal method :

- In an extended longitudinal study, a whole series of measurements is available for each child. If these measurements are plotted against chronological age, a curve of growth is obtained. The slope of this "distance – traveled" curve gives a picture of successive increment or velocities.
- The velocity curve or curve of first differences is obtained by plotting the increments against age. Measurements commonly used in growth studies

The general pattern of postnatal growth is quite similar from one individual to another, but there is considerable individual variability in size attained and rate of growth at different ages, with respect both to the body as a whole and to specific parts. Both the whole body and its parts, therefore, must be measured, and the study of growth is synonymous to a large extent with measurement.

Breadth or width measurements are ordinarily taken across specific bone landmarks and therefore provide an indication of the robustness, or sturdiness, of the skeleton. The commonly used skeletal breadths are biacromial breadth, bicondylar breadth etc. Limb circumferences are occasionally used as indicators of relative muscularity.

Skinfold thicknesses are indicators of subcutaneous fat, the portion of body fat located immediately beneath the skin. Skinfolds can be measured at any number of body sites. Most often they are measured on the extremities and on the trunk, to provide information on the distribution of subcutaneous fat in different areas of the body.



The most commonly used skinfold thicknesses are the triceps skinfold, the subscapular skinfold, medial calf skinfold, suprailiac skinfold etc. Some measurements are useful during particular phase of growth. Head circumference, perhaps the most important, is taken on infants and children, usually to 3 or 4 years of age.

**Difficulty level: Easy**

**Mentors4ias test series: Test 10: Question 8(c) Explain the various methods used for growth studies.**

**Source: Biological anthropology by Dr Arjun Bopanna.**

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**7 (a) Discuss how indigenous people encounter globalization.**

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**Structure-**

- Define Globalization (20-30 words)
- Explain the process of Globalisation (40-60 words)
- Discuss its impact (positive and negative) on Indigenous people- bring out the socio-economic perspective (100-120 words)
- Add few lines from India point of view...

**Supporting points:**

Globalization is a term used to describe how countries, people and businesses around the world are becoming more interconnected, as forces like technology, transportation, media, and global finance make it easier for goods, services, ideas and people to cross traditional borders and boundaries. Globalization offers both benefits and challenges. It can provide tremendous opportunity for economic growth to improve the quality of life for many people. It can also lead to challenges with the welfare of workers, economies, and the environment as businesses globalize and shift their operations between countries to take advantage of lower costs of doing business in other world regions.

The term globalization has been associated with key areas of change, which have led to a marked transformation of the world order. Globalization in India is generally taken to mean ***integrating the economy of the country with the world***. This, in turn, implies opening up the economy to foreign direct investment by providing facilities to foreign companies to invest in different fields of economic activity in India. Lets look at general impact... Organise them as per the demand of your answer...

Economic globalization has to do with increased economic interdependence and integration of all national economies into one global economy. Abdurrahman and Kura (2013) noted that globalization has two important dimensions: the first is concerned with economic aspects, which comprises trade, investment, technology, cross border production systems, information flows and communication; and the second deals with increased homogenization of policies and institutions in the international system on trade and capital market liberalization, standardization of policies and so on. Here, emphasis is simply on economic interests that profess breaking down of national economic barriers; the international spread of trade, financial and production activities, and the growing power of transnational corporations and international financial institutions.

**Impact on primitive (indigenous) economy:**

- Monetization
- Individual ownership of property



- Change in occupation pattern
- Threat to indigenous knowledge and biopiracy
- Economic control by MNCs
- Break down of traditional economy system;
- Replacement of traditional system with more exploitative regime
- Loss of traditional resources due to encroachments, land alienation Ex: Amazon tribes have lost their forest to MNCs
- Positive- Greater market for indigenous product Ex- market for folk art; In Karnataka Tribal grown coffee is being sold → empowerment of tribes

**Impact on Indigenous people of India (Rural and tribals)-**

- Enhanced opportunities - as a result of marketization, privatization and larger foreign investment
- The scope for productivity and wage increase is greater with new technology
- A large number of opportunities in the export- better price for farm produce, food processing etc
- The rapid growth expected from the new economic policy is expected to generate large employment opportunities.
- Greater opportunities for migration and vertical mobility (social change)
- Prospects of higher and quality education
- Attitudinal changes towards women's role in the family due to good education, benefits of family planning and health care, child care, good job opportunities etc
- Disintegration of caste system and evils associated with it

**Issues-**

- More and more people have become ignorant about social, ethical and moral values.
- Loss of indigenous culture
- Tough competition- agrarian distress (cheap farm import)
- Excessive use of fertilizers and pesticides- effect sustainability of farming
- Consumerism culture
- Migration- change in family structure, kinship system
- Weakening of traditional social institutions and not being replaced with alternative institution- social disharmony

(You can add concepts of dominant caste, sanskritization, changes to Jajmani system to substantiate certain points)

**Difficulty level: Easy to Moderate**

**Mentors4ias anthropology**

**Test 5- Question 5 (c) Globalisation and primitive economic system**

**Test 1- Question 5(b) Globalisation and Indian Village**





**7 (b) "Applied human genetics has come to touch every sphere of human life.  
"Discuss in light of recent advances in molecular anthropology. (15 Marks)**

Molecular anthropology is a field of anthropology in which **molecular analysis is used to determine evolutionary links between ancient and modern human populations**, as well as between contemporary species. Molecular anthropology uses the tools and techniques of molecular genetics to answer anthropological questions

- Generally, comparisons are made between sequences, either DNA or protein sequences; however, early studies used comparative serology.
- By examining DNA sequences in different populations, scientists can determine the closeness of relationships between populations (or within populations).
- Certain similarities in genetic makeup let molecular anthropologists determine whether or not different groups of people belong to the same haplogroup, and thus if they share a common geographical origin.
- This is significant because it allows anthropologists to trace patterns of migration and settlement, which gives helpful insight as to how contemporary populations have formed and progressed over time
- Molecular anthropology has been extremely useful in establishing the evolutionary tree of humans and other primates, including closely related species like chimps and gorillas.
- More recent studies have concluded that there is roughly 98 percent to a commonality of 94 percent, showing that the genetic gap between humans and chimps is larger than originally thought
- Such information is useful in searching for common ancestors and coming to a better understanding of how humans evolved.

**Case study: Mitochondrial study and the Origin of Modern Humans**

Mitochondria are energy-harvesting organelles in the cell. They are inherited only from the mother, and so track maternal inheritance. Like microsatellite DNA, mitochondrial DNA accumulates mutations faster than chromosomal coding DNA. One of the earliest and most famous mitochondrial studies was used to address a central question in anthropology, the origin of humans. The Homo genus itself is universally believed to have originated in Africa. Groups of Homo erectus are known to have migrated out of Africa, populating Europe and Asia between one and two million years ago. H. erectus gradually changed in character, so that by about half a million years ago, it had taken on some more modern characteristics. Anthropologists call these groups "archaic" modern humans. They include the Neandertals, who lived in Europe and the Middle East from 150,000 to 28,000 years ago.

- The scientists who performed the mitochondrial DNA study reasoned that populations that had been in one place for only a short period of time would show very little variation in their mitochondrial DNA, since they all shared a relatively recent common ancestor.



- This would be the case in a modern human population if it had only recently migrated into the area in which it is found. (is known as the founder effect.)
- In contrast, populations that have remained in place for long periods have much more ancient common ancestors, and therefore have more mitochondrial DNA variations.
- To perform their analysis, the scientists collected samples from different ethnic groups from all over the world.
- They found that the populations with the greatest amount of sequence variation were in sub-Saharan Africa, indicating these were the groups with the most ancient ancestry. All other groups had much less variation, indicating more recent arrivals of those groups in those regions.

### **Application:**

Using the tools of molecular genetics, DNA sequences can be compared among groups to test hypotheses about the evolutionary relatedness of organisms, and about the time that has elapsed since divergence. Molecular anthropology has made major contributions to **understanding the migration and mixture patterns of human groups**. It has also provided significant **new insights into the rise and spread of modern humans** and their relation to earlier human groups. As more data becomes available and better models are devised for their interpretation, the results are likely to become less provisional and more certain.

**Difficulty level: Moderate to High**

**Mentors4ias anthropology test: Only part of the question: Test 12- Question 6(b): What is Human Genetics? Briefly describe the applications of Human Genetics.**



**7 (c) Evaluate participant observation in producing anthropological knowledge.**

**Structure:**

- Define Participant observation (30-40 words)
- Explain the features (60-70 words)
- Merits and Demerits (Evaluation) (60-70 words)
- Conclusion (how to overcome the challenges) (20-30 words)

**Supporting points:**

DeMUNCK and SOBO (1998) describe participant observation as the primary method used by anthropologists doing fieldwork. Fieldwork involves "active looking, improving memory, informal interviewing, writing detailed field notes, and perhaps most importantly, patience".

Participant observation is the process enabling researchers to learn about the activities of the people under study in the natural setting through observing and participating in those activities. It provides the context for development of sampling guidelines and interview guides. SCHENSUL, SCHENSUL, and LeCOMPTE (1999) define participant observation as "the process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the researcher setting"

**Participant Observation:** When the researcher actively participates in the activities of the group under investigation, it is known as participant observation. In the extreme level of participant observation, the researcher might conceal one's identity. It can be called *total participant observation*. Such kind of observation is resorted to when the researcher intends to keep the natural setting intact, without any kind of disturbance. In situations in which one's role is confined to that of a researcher and it is openly declared, is known as *quasi-participant observation*.

Observation is divided mainly into two types: Uncontrolled observation and Controlled observation.

**Uncontrolled Observation**

- Uncontrolled observation is a form of observation which is made in the natural environment without being influenced by outside control or external factors.
- Most of the knowledge about the social phenomena is generally derived through uncontrolled observation.
- There are two types of uncontrolled observations, participant observation and non-participant observation.

**The features of participant observation are detailed below: The observer -**



- Takes part in the social events which she or he is observing.
- Assumes a role or undertakes a job that is acceptable in the given social context.
- Ensures that the observer's presence in the group does not disturb the normal life of the group.
- Generally lives, shares and participates in the everyday life of the group.
- Associates with the group not as a researcher but as a full-fledged member of the group.
- Observe the behaviour of the members of the community.
- Discerns the inter-action and relationship between them.
- Engages in conversation with them to find out their responses, meanings and explanations of the events that occur.
- Studies the life of a community or social unit as a whole (holistic study).

### Advantages of Using Participant Observation

- DeMUNCK and SOBO (1998) provide several advantages of using participant observation over other methods of data collection. These include that it affords access to the "backstage culture"; it allows for richly detailed description, which they interpret to mean that one's goal of describing "behaviors, intentions, situations, and events as understood by one's informants" is highlighted; and it provides opportunities for viewing or participating in unscheduled events.
- DeWALT and DeWALT (2002) add that it improves the quality of data collection and interpretation and facilitates the development of new research questions or hypotheses

### Disadvantages:

- DeMUNCK and SOBO also share several disadvantages of using participation as a method, including that sometimes the researcher may not be interested in what happens out of the public eye and that one must rely on the use of key informants.
- The MEAD-FREEMAN controversy illustrates how different researchers gain different understanding of what they observe, based on the key informant(s) used in the study.
- Problems related to representation of events and the subsequent interpretations may occur when researchers select key informants who are similar to them or when the informants are community leaders or marginal participants
- JOHNSON and SACKETT (1998) discuss participant observation as a source of erroneous description in behavioral research. They note that the information collected by anthropologists is **not representative of the culture**, as much of the data collected by these researchers is observed **based on the researcher's individual interest** in a setting or behavior, rather than being representative of what actually happens in a culture. For example, they report that more data has been collected about



political/religious activities than about eating/sleeping activities, because the political/religious activities are more interesting to researchers than eating/sleeping activities; yet, the amount of time the cultural members spent on political/religious activities was less than 3%, while the amount of time they spent eating/sleeping was greater than 60%. Such actions skew the description of cultural activities.

- Several researchers have noted the limitations involved with using observations as a tool for data collection. For example, DeWALT and DeWALT (2002) note that male and female researchers have access to different information, as they have access to different people, settings, and bodies of knowledge. Participant observation is conducted by a biased human who serves as the instrument for data collection; the researcher must understand how his/her gender, sexuality, ethnicity, class, and theoretical approach may affect observation, analysis, and interpretation.

To alleviate this problem, they advocate the use of systematic observation procedures to incorporate rigorous techniques for sampling and recording behavior that keep researchers from neglecting certain aspects of culture.

**Difficulty level: Moderate**

**Mentors4ias test series: Test 7: 6(c) What is observation method? Write about the merits and demerits of participant. Observation method.**

**8 (a) Discuss with examples the Megalithic culture of India in the archaeological context.**

**Structure:**

- Introduction- what is megaliths/site / time period (40-50 words)
- Features ( 130-150 words)
- Significance (50-60 words)
- Draw Diagrams

**Supporting points:**

**Megalithic culture**

- A megalith is a stone which is **larger in size and has been used to construct a monument or a structure.** The monument or the structure has been constructed either alone or together with other stones.
- Megalithic has been used to describe buildings built by people living in many different periods from many parts of the world.
- The construction of this type of structures took place **mainly in the Neolithic and continued into the Chalcolithic Age, Bronze Age and Iron Age.**





- There are large numbers of megaliths found all over world but we may group the similar types together. The types of megalithic structures can be divided into two categories, the “Polylithic type” and the “Monolithic type”. In polylithic type more than one stone is used to make the megalithic structure. In monolithic type the structure consists of a single stone.
- Polylithic types - Dolmen, Cairn, Cromlekh, Cis,
- Monolithic type- Menhir, Stone Circle

## MEGALITHIC CULTURE OF INDIA

### Background and some discoveries

- In the last quarter of the 19th century, Dr. Jagor first excavated in the classic site of Adicanallur in the Tirunelveli district, Tamil Nadu. The extensive site of Junapani, near Nagpur in Maharashtra was also excavated on a small scale by Rivett-Carnac (1879).
- Simultaneously, extensive exploration in the Madras region continued, resulting in the publication of the list of antiquarian remains in the Presidency of Madras by Sewell in 1882.
- At the turn of the century, Foote (1901) brought out an excellent Catalogue of antiquities, including megaliths. In the later years of the 19th century, Alexander Rea (1902-03) excavated a number of megalithic sites in South India. The classic site of Adichanallur was also reexcavated in 1903-04 by Louis Lapicque.
- The remarkable variety and distinctive natures of the Indian Megalithic cultures were then placed before the world by Rea in 1915, when he published the Catalogue of the Prehistoric antiquities from Adichanallur and Perumbair. A decade later, Hunt (1924) published the result of the excavation of Megalithic graves in Andhra Pradesh. By the end of the first quarter of the 20th century, a number of Megalithic sites had been excavated.
- **However, the first attempt to place the South Indian Megaliths in a chronological framework was by Sir Mortimer Wheeler (1948), who excavated the sites of Brahmagiri and Chandravalli in Karnataka in 1944.** In 1962, it appeared that the megaliths, that is, huge stone monuments, were a special feature of South India.

### Architectural Features of South Indian megaliths

- Preliminary classification had shown regional types.
- Wheeler’s excavation at Brahmagiri showed that these were not as old as once believed. This was confirmed by subsequent excavations at Sanur, Maski and other places.
- While studying the Karnataka megalithic monuments A. Sundara (1975) concluded that “the varied tomb types in different geological zones are essentially due to the traditional affiliations rather than environmental influence.”



- The megalithic builders at Hallur and further south at Paiyampalli, were not only adept at quarrying all kinds of stones, but they made a judicious use of these rocks. They employed a particular stone for a particular part of the tomb. Again, these people were excellent architects-engineers. The best example is the constructional plan of the passage chamber.
- Though we still do not know about the houses and habitations of these megalithic builders, the recovery of sickles and plough coulters of iron, rice and ragi grains from the excavations at Kunnattur and Hallur respectively, shows that these people were probably dependent largely upon agriculture and partly upon hunting, as proved by the hunting scenes in the rock-paintings at Hire-Benkhal.
- Animals such as cow/ox, goat/sheep, dogs and horses were domesticated. So far no evidence of literacy in the form of writing of any kind has been found from the megaliths in Karnataka.
- Finally, on the question of the identity of the megalithic builders, Sundara (1975) has shown how there was mutual borrowing between the Neolithic-Chalcolithic inhabitants of Karnataka and the megalithic builders who arrived about 800-700 BC. As Kennedy has said, it is difficult to say anything about the racial types from the study of the extant skeletal remains.
- Hence, the only thing left to a culture-historian is **cultural relics**.
- The megalithic culture shows that the megalithic communities were dominated by religious and supernatural beliefs. This is evident from the elaborate objects associated with the burials.
- Different burial tradition could indicate different social and ethnic groups, but so far no fixed regional conventions regarding orientation of the bodies or the graves have been observed.
- The burials vary from total to only fractional types. In the Vidarbha region horses were buried with the dead, possibly after sacrifice, and this may have been a local ethnic tradition.
- The social organisation of the Megalithic people of India can be worked out only in a sketchy manner, and data on settlement pattern are virtually absent. However, it appears that communities may have comprised different professional groups, such as smiths, warriors, goldsmiths, agriculturists and carpenters. This may be deduced from the types of grave goods offered.
- Even burial must have involved community effort because setting of such huge stones in a Circle or erection of a gigantic Menhirs, or the placing of massive stone slabs on a Dolmen is not possible by one or two individuals.

### Ethnic Affinity and Origin –

The origin of Megalithic culture in India is not clear. No satisfactory answer is yet found. Some early European scholars put forward a view that the builders were Celts or Scythians. Rivett-Carnac related them to Central Asian tribes. Others scholars tried to relate them to the Dravidians. Practice of erection of megaliths are still found among some tribes in India in the



southern, central, eastern and northeastern parts of the country. The skeletal remains found especially from Brahmagiri, Yeleswaram and Adichanallar show that people were of a mixed racial type. According to Sarkar (1960), the Brahmagiri skeletal remains were probably of Scythians or Iranian stock. Gupta and Dutta (1962) concluded that similar trend is noticed for Yeleswaram remains but Adichanallur skull, however, show different affinities.

### Chronology

Apart from the ethnic affinities and possible migration, the chronology of megaliths in India still poses certain problems. Wheeler (1948) assigned a date for the megalithic culture approximately to the 2nd Century B.C. Gordon and Haimendorf proposed dates between c. 700 to 400 B.C. Seshadri (1956) dated them between 6th century B.C. to 1st century A.D. Sundara (1969-70) proposed a date at c. 1100 B.C. for Terdal in Karnataka. Sundara and Aiyappan (1945) extended antiquity of the megaliths as far back as the Indian Neolithic times. The Chalcolithic-megalithic contact period in Maharashtra goes back to c. 700 B.C. Megaliths of Vidarbha is dated to the 6th or 7th centuries B.C.

While the question of date of the megaliths cannot be easily settled, well-organised attempt be made to understand the political, social and economic background of the megalith-builders, be it in Vidarbha, Andhra, Karnataka or in Tamilnadu. It seems almost certain that no ordinary family or individual could erect such huge megaliths. Community effort and activity must have been involved in the erection of such huge structures. Such community involvement is noticed among the tribes of the present-day who are still practicing erection of megalith

**Level of difficulty: Moderate**

**Mentors4ias test series: Test 4: Question 8 (c) Examine the cultural features and significance of megaliths in India.**

Mentors4ias

**SCHEDULE**

- Test-1: Indian Anthropology
- Test-2: Tribal Anthropology
- Test-3: Biological Anthropology
- Test-4: Physical Anthro & Cultural Evolution
- Test-5: Socio-cultural Anthropology
- Test-6: Anthropological thoughts
- Test-7: Section A- Paper 1
- Test-8: Section B: Paper 1
- Test-9: Paper 2
- Test-10: Comprehensive test: Paper 1
- Test-11: Comprehensive test: Paper 2
- Test-12: Comprehensive test: Paper 1
- Test-13: Comprehensive test: Paper 2

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**8 (b) Discuss the bio-cultural factors influencing fertility in light of the relationship between fecundity and fertility.**

**Structure:**

- Define Fecundity and fertility- explain the relationship between the 2 (50-60 words)
- Biological factors effecting fertility (50 words)
- Cultural factors effecting fertility (50 Words)

**Supporting points:**

Fecundity is a measure of the number of offspring produced by an organism over time. It is also called the reproductive rate of an organism. Fecundity is measured by the number of offspring that are created successfully.

A population exhibits more fecundity when each organisms produces more offspring successfully, and the population grows.

Fertility is simply a description of whether or not individual animals are able to reproduce. An organism can produce many gametes ready for fertilization, but may never get the chance to reproduce. This organism would be fertile, but would show no fecundity.

As a measure, fertility rate is the number of offspring born per mating pair, individual or population.

Thus Fecundity is what can be (Actual)... and Fertility (Potential) shows what is...

Breaking barriers to greatness

Factors effecting: Refer Page 215 of Biological anthropology by Dr Arjun Bopanna

**Difficulty level: Easy**

**Mentors4ias test series:**

**Test 3: 4 (b) How does socio-economic factors effect fertility rate in a society? Explain 15**

**Test 8: 2 (a) Distinguish between the terms 'fecundity' and 'fertility'. Are the factors influencing them distinguishable? Discuss**



**8 (c) Discuss phenomenology as a research method in anthropological studies.**

**Structure:**

- Define Phenomenology (30-50 words)
- Explain Phenomenology in Anthropology (60-70 words)
- Significance- How it enhances research method in anthropology (40-50 words)

**Supporting points:**

Husserl envisaged phenomenology as the descriptive, non-reductive science of whatever appears, in the manner of its appearing, in the subjective and intersubjective life of consciousness.

Phenomenology is therefore, the study of consciousness as experienced from the first-person point of view. By etymology, phenomenology is the study of phenomena, in the root meaning of appearances; or, better, the ways things appear to us in our experience, the ways we experience things in the world around us.

By contrast, neuroscience studies how consciousness is produced in a person's brain, characterizing his neural-mental state from an objective, third-person perspective. Thus, where a brain scan (an MRI image) shows which parts of the brain are most active (burning glucose), a phenomenological description characterizes what the person is experiencing ("I see a fishing boat" or "I feel a pain in my left foot").

- Phenomenology inspire anthropology to re-evaluate its principal method
- The focus in this field is not only on the way people perceive but also how they experience the world.
- This allows for a view that does not treat experience of the world separately from cognition of the world. Religion can thus be studied as it is lived and acted in concrete situations.
- By seeing the scholar as part of the life-world of the people in whose lives she participates, phenomenology in anthropology goes against the tendency to privilege 'scientific' knowledge over other kinds of knowledge.
- This has some important theoretical ramifications, most notably the refusal to transcend lived experience through theory.

**Difficulty level: High**





### Our Analysis:

- Over all it was a moderate level question paper
- Lot of questions (and very specific) were asked from archaeological anthropology adding to the challenge
- This paper would have helped students who have read basics and put in efforts to understand the underlying theories and principles
- Guide books and Question answer books would not have helped this time
- IGNOU was a very import source for social cultural and archaeological anthropology
- Those who practiced answer writing would have had an edge
- Mentors4ias test series covered almost 80% of the questions

### How to prepare for 2020 Anthropology:

- Focus on basics. Build your theoretical knowledge from standard books till December this year
- January and February → prepare micro-notes for the entire syllabus
- Practice writing or test series and get them evaluated from experts. Correct your mistakes and get the right approach
- Post prelims → revise your micro-notes and write a good test series
- Avoid guide books (UPSC is like Nature.. it keeps innovating → only the fittest will survive 😊)
- For any guidance and mentorship feel free to visit us and interact with our mentors @ Vijayanagar, Bangalore. (contact- 9886777417) or Hebbal, Bangalore (Contact-9886151564)

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