

Evaluation Indicators	
Language:	Language used is easy and understandable
Structure:	Systematic structure followed
Presentation:	Need improvement according to the demand of the questions properly
Hand Writing :	Good
Content:	Content elaboration need improvement according to the demand of the questions properly and word limit assigned
Attempt:	Overall good performance Attempt all questions properly
Remarks:	<p>It is appreciable that you have attempted the question properly Presentation and structure is good and appropriate Content elaboration need improvement according to the demand of the questions properly and word limit assigned Follow the suggestion properly and model answer for more information Keep writing all the best Maintain the same consistency</p>

UPSC

Please do not write anything except the Question number in this space

Answer Question in NOT MORE THAN the word limit specified for each in the parenthesis
Content of the Question is more important than length.

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Candidates must not write on this margin

Enter Number of Question

Anthropology derived from Anthropos (Humans) & logos (study) has been defined by P.C. Joshi as - "The study of biological, cultural, social, psychological, linguistic & temporal aspects of human beings in a holistic comparative perspective achieved through physical or digital fieldwork investigation carried out to generate insightful, perceptive, experimental & pragmatic outcomes to create a peaceful, sustainable & tolerable world" (NK Bose Memorial Lecture).

Introduction is good and appropriate but try to add the introduction in short with significant points

Nature of Anthropology

- (i) Natural as well as social science
- (ii) Science of curiosity
- (iii) It is applied as well as action
- (iv) Relies on fieldwork & Cultural Relativism
- (v) It is Bio-cultural - Study of evolution through ages.

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(vi) Involves unique combination of comparable historical & holistic study.

Scope of Anthropology

Divided Into 4 Main Branches.

(i) Physical

Studies biological evolution & variation

Contributors → Darwin, Lamarck, Huxley etc

(ii) social

Study the various aspects of man's society across space & time

Contributors → Malinowski, R.C. Brown etc

(iii) Linguistic

Studies origin & evolution of language

Contributors → Sapir, Worf etc.

Address the demand of the questions properly
Quality of the content need improvement according to the demand of the questions properly
Need to. Add it's nature with wide scope with present challenge and limitations
Add it's development process with different anthropologist with contemporary relevance and significance
Follow model answer properly for more information
Keep writing all the best

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(iv) Archaeological

study of Human culture through the study of
study of Contributors

Here are some ways in which anthropology has developed and contributed.

1. Cultural Understanding: Anthropologists help bridge cultural gaps by promoting empathy and understanding among diverse populations. Their research aids in addressing issues of cultural sensitivity, social integration, and intercultural communication.

2. Globalization and Identity: As globalization accelerates, anthropology studies how local communities navigate changing landscapes. It examines how globalization affects cultural identity, traditions, and the dynamics of power in societies.

3. Development and Policy: Anthropological research informs development projects and policies, ensuring they respect local cultures and communities. By considering the perspectives of the people affected, anthropology contributes to more effective and sustainable interventions.

(i) Fieldwork Approach

(ii) Cultural Relativism
They document cultural heritage, land rights, and traditional knowledge, helping to protect the rights of these communities

(iii) Holistic study
4. Human Rights and Indigenous Rights: Anthropologists advocate for the rights of marginalized groups, including indigenous populations. They document cultural heritage, land rights, and traditional knowledge, helping to protect the rights of these communities

(iv) Comparative study
5. Environmental Anthropology: This emerging field focuses on the relationship between humans and their environments. Anthropologists study how different societies interact with nature, contributing valuable insights to environmental conservation efforts.

(v) Systemic & Biocultural Approach
6. Medical Anthropology: Anthropologists examine how culture, society, and biology intersect in the realm of health and illness. Their research contributes to understanding healthcare disparities, traditional healing practices, and the social determinants of health.

(vi) Case studies

Role of Anthropology in Contemporary societies

1) Has abolished the myth of superiority of races.

2) Has debunked the tribal as savages myth

3) Enabled us to adapt to change by proving human behaviour is not inherited but learned

4) Rural & Tribal development

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5) Solve inter & Intra tribal / ethnic conflict by adopting cultural relativism.

6) Conservation of Environment & Biosphere through Concepts such as - NMS Complex by Vidyaathi.

Development of Anthropology

1) Social

- New forms of Marriage (eg - polygamy) & living patterns (Live in Relation)
- Changing family structure, eg - Joint family & Nuclear

2) Physical

- Increased use in sports - (biroanthropometry)
- New technologies (eg - DNA finger printing)
- In light of recent Pandemic COVID-19.

3) Linguistic

- Conservation of Endangered languages, eg - Maitri of

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

Thus Anthropology is rightly referred to as "the most liberating" of sciences.

02

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Amongst man's many unique features, the most unique is undoubtedly language & speech. Both language & speech make up an important part of culture & social anthropology is its study of culture also studies the origin & evolution of language which is known as Linguistic.

Introduction is good and appropriate

Anthropology

Development of Linguistic Anthropology

- (i) Origin can be traced to metaphysical writings of 17-18th century ~~philosophers~~.
- (ii) Formal call for study of origin of language first made by E.B. Tylor in his "Research into the Early history of Mankind".
- (iii) However, it was Bell Hymns who coined the term linguistic anthropology & combined all interests of anthropology

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In the study of language

iv) Malinowski Boas & others laid an emphasis on linguistic aspects of primitive societies & tried to learn language of natives

v) In India, Verrier Elwin, S.C. Roy, Harnenderf stressed on importance of language of tribals

Presentation and structure is good and appropriate

Contextual awareness is good and appropriate

Well organised systematic structure followed

Need to concentrate on the its wide scope in various dimensions with present relevance and significance with its challenge and limitations

Add its development process with present relevance and significance

Follow the suggestion properly and model answer for more information

Keep writing all the best

Branches & scope of Linguistic Anthropology.

1) Historical / Comparative

→ Studies the origin of language & its development / divergence

2) Structural / Descriptive

→ Studies construction of language & rules governing it

→ Studies phonemes, syntax etc.

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3) Social

→ studies language in social context

(eg) How different words are used in different situation

4) Ethno- Semantics

- Aims to understand linguistic culture from point of view of natives

Importance of Linguistic Anthropology

1) Study Relation between language & Social Behaviour

(eg) → In ancient India Kings & Brahmins spoke Sanskrit while Commoners spoke Prakrit.

2) Study various Aspects of Culture

(eg) - Clifford Geertz identified many terms in Balinese language related to 'Cocks'

3) Conducting fieldwork in native language

4) Understanding relation between various languages

(eg) - Marathi & Sinhali have similarities due to their common origin from Indo Aryan family.

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⑤ Protection & Promotion of Endangered languages of primitive society

⑥ Tap into ancient knowledge systems

⑨ - ~~Medieval texts~~ Some of the current challenges and limitations of linguistic anthropology are:

Challenges & Limitation

1.) Threat of languages

• The ethical and practical dilemmas involved in applied linguistic anthropology, such as who are the publics, what kind of change is desired, and how to measure the impact of linguistic interventions

• The rapid loss of linguistic diversity and the threat of language extinction, which poses challenges for documenting, revitalizing, and maintaining endangered languages and cultures

• The complexity and dynamism of language and communication in the context of globalization, migration, and digital media, which requires new theoretical and methodological tools to capture the multilingual, multimodal, and transnational nature of social interactions

Good attempt

2.) Lack of popularity Among various Branches.

3.) Lack of Representation of linguistic anthropologists in Administration

4.) Lack of funds for Development

5.) Hostility of Tribal & primitive Groups to outsiders makes it difficult to study their languages.

You have concluded the answer properly. Maintain the same consistency

Language is the vehicle of culture & the death of a language mean death of a culture. Thus, in this light, linguistic Anthropology occupies a very important place.

03

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Evolution is defined as the change in the genetic frequencies of man. The curiosity of man about himself and his ancestors gave rise to the study of evolution as early as 4th Century B.C. These theories are divided into -

Introduction is good and appropriate

- (i) Pre-Darwinism
- (ii) Darwinism
- (iii) Post Darwinism

Pre Darwinism

- (i) Theophrastus - (4th Century Bc) - Book on seed germination.
- (ii) Linnaeus - (18th Century) - Grouping of plants & Animals in "Systema Naturae"
- (iii) Cuvier - (18th Century) - Theory of Catastrophism.
- (iv) Sir Charles Lyell - (19th Century) - Study of evolution of Earth's crust (Principle of Geology 1830)

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The most important theory was.

v) Lamarckism

- Given by J. B. Lamarck (1809).

- Given in "Philosophique Zoologie"

- Based on 4 postulates

a) Theory of Elan Vital (Internal Growth)

b) Theory of Need of organs.

c) Theory of use & disuse

d) Theory of Inheritance of All acquired

Presentation and structure is good and appropriate

Contextual awareness is good and appropriate

Well organised systematic structure followed

Need to concentrate on the thier critical analysis

properly with present relevance and significance in

the contemporary society

Follow model answer properly for more information

Keep writing all the best

Characteristics

Criticism

1-) A. Weissman through experiment on

rats disproved inheritance of acquired characteristics

2-) Not Based on Science or facts

Darwinism

- Given by Charles Darwin

- Given in "On the origin of species by Natural selection" (1859).

- Influences

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o) Malthusian Essay on population - (1798)

o) Charles Lyell - Principle of Geology (1830)

o) Theory of Natural selection - Alfred Wallace (1858)

- Based on 3 observations & 2 inferences

Observation 1 - All organisms have potential for explosive growth outstripping food supply.

Observation 2 - Human populations are roughly stable

Inference 1 - There is a struggle for existence.

Observation 3 - Nature is full of variations.

Inference - 2 - Some variations are advantageous hence favourable, others are disadvantageous hence disfavoured. This is Natural selection

Criticism - 1) Geometric Growth not true for Human population

2) Does not consider Mutation, Genetic recombination etc -

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Post Darwinian

- (i) Re discovery of Mendel's Law by Tschermak.
 - (ii) Theory of Mutation - Hugo De Vries (1901)
 - (iii) Theory of Germplasm & somatoplasm.
 - (iv) Synthetic theory
- Proponents: Huxley, Dobzhansky etc.
- Cause & factors necessary for evolution
 - 1) Gene Mutation
 - 2) Change in chromosome number
 - 3) Genetic Recombination] Cause Variation
 - 4) Isolation
 - 5) Genetic Drift
-] Limit Variation.
- 6) Migration
- 7) Hybridisation
-] Spread Variation
- 8) Natural selection] Central factors acting on all others.

Good attempt
11

You have concluded the answer properly
Maintain the same consistency

These theories mark a watershed moment in history of anthropology by answering the crucial question of origin of human beings.

04

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Adaptation refers to the biological, social & cultural modifications undergone by an organism to be able to survive better in a particular environment.

Introduction is good and appropriate

Primates are "unguiculate, clavuculate, plantar mammals with orbits enucleated by bones, three kinds of teeth atleast one stage of life; brain always with a posterior lobe & calcarine fissure; innermost digits of atleast one pair of extremities opposable, hallux with a flat nail or nose; well developed caecum, penis pendulous, testes scrotal & 2 pectoral mammae" (Mewart, 1873)

Primate Adaptations

- can be understood in terms of locomotory adaptations - arboreal or Terrestrial

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Arboreal Adaptations

1.) Vertical Clinging & Leaping

o) Only Primates. - Eg - Bushbabies, Lorises

o) Adaptations

- ↳ Long tarsal bones.
- ↳ Extremely strong hind limbs

2.) Brachiation

o) suspensory behaviour in which both hind & fore limbs are primary organs for locomotion

o) Types

(i) True - Eg → Gibbon

(ii) Primitive - Eg - orangutan

3.) Quadrupedalism

o) May be - Arboreal or Terrestrial

o) Adaptations

- ↳ Almost equal fore & hind limbs
- ↳ Some have prehensile Tail for balance & suspension. Eg - New world monkeys.
- ↳ Lower Center of Gravity

Address the demand of the questions properly
Don't add the unnecessary points as your restricted to the word limit assigned.
Here you need to add about social organization types not about the locomotory adaptations
So follow the suggestion properly and model answer for more information
Keep writing all the best
Maintain the same consistency

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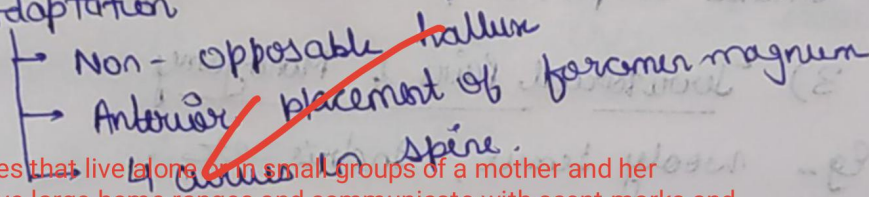
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Candidates must not write on this margin

Enter Number of Question

4) ~~Quadrupedalism~~ Bipedalism

- o) True ~~Bipedalism~~ Bipedalism only in humans
- o) Adaptation



1. Solitary: Primates that live alone or in small groups of a mother and her offspring. They have large home ranges and communicate with scent marks and vocalizations. Examples are orangutans, lorises, and some lemurs.

2. Pair-bonded: Primates that form monogamous or long-term relationships with a single mate. They share parental care and defend their territory against intruders. Examples are gibbons, siamangs, and some tamarins.

3. One-male multi-female: Primates that have a single dominant male with a group of females and their offspring. The male protects the group from predators and other males, and has exclusive mating rights with the females. Examples are gorillas, geladas, and some tamarins.

4. One-female multi-male: Primates that have a single dominant female with a group of males and her offspring. The female controls the access to food and mates with multiple males. The males help with parental care and defense. Examples are marmosets, some tamarins, and some lemurs.

5. Multi-male multi-female: Primates that have a large and complex group of males and females of different ages and ranks. They have a dominance hierarchy that determines the access to resources and mates. They also have strong social bonds and cooperation among group members. Examples are chimpanzees, bonobos, baboons, and macaques.

6. Fission-fusion: Primates that have a flexible and dynamic group structure that changes depending on the availability of food and mates. They split into smaller subgroups (fission) or merge into larger ones (fusion) as needed. They maintain social ties through vocalizations and grooming. Examples are spider monkeys, some chimpanzees, and some orangutans.

7. Multilevel: Primates that have a hierarchical and modular group structure that consists of several levels of social units. They have a core unit of one-male multi-female groups that are nested within larger units of clans, bands, and troops. They have different types of interactions and alliances among

o) Types of social organisation,

1) Dispersed & Solitary Polygyny.

Eg → Prosimians - Lemurs, Lorises.

- Orangutan - because of size.

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2) One Male Groups & Polygyny

Eg - Langurs, Cebus monkeys

o) Intense competition for access to females.

3) Territorial Pairs & Monogamy

Eg - woolly lemurs, Indris etc.

4) Nested Grouping Patterns

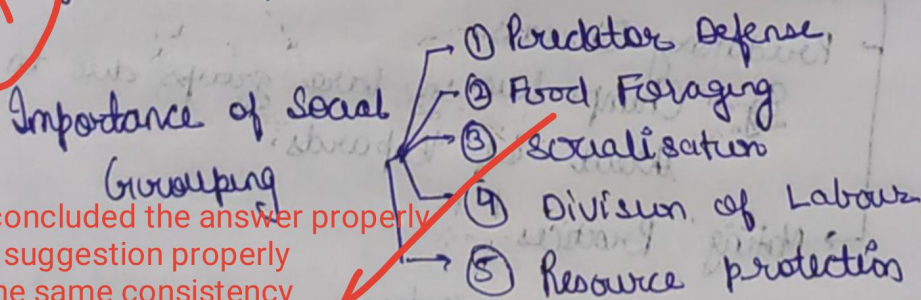
Eg - Hamadryas, Baboons & Gelonides.

5) One female Groups & Polyandry

Eg -

6) Multi - Male / Female Group & Polygynandry.

Eg - Macaques, baboons etc.



You have concluded the answer properly
Follow the suggestion properly
Maintain the same consistency
Keep writing all the best

Thus primate social groupings are an essential part of primate life. A deeper study is needed so as to make more insightful conclusions.

Q5

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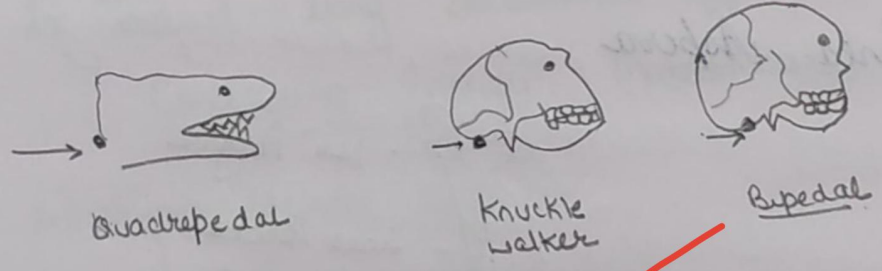
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Erect posture & bipedalism are two of the greatest indicators of the process called 'homination'. The first bipedal individual was the Australopithecus.

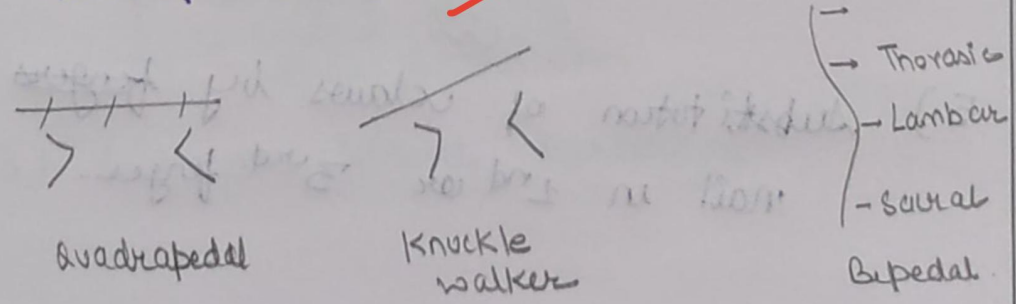
Introduction is good and appropriate

The transformation of humans from Apes for erect posture & bipedalism involved many skeletal changes such as —

1) Anterior - Forward & Downward - Placement of Foramen Magnum



2) Development of 4 spinal Curves.



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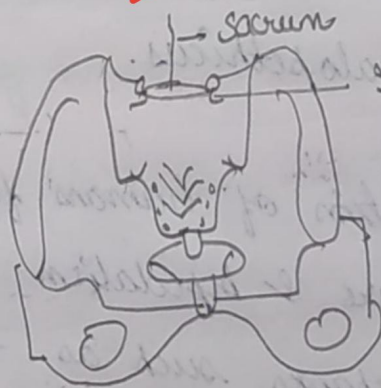
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3.) Shortening & Broadening of Pelvis & joining of sacrum with ilium to transfer load on legs & femur

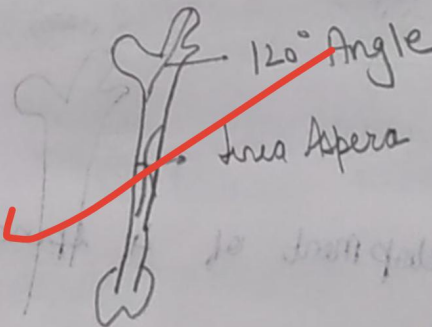


Rj: Human Pelvis

Address the demand of the questions properly
You need to add the information in detail about skeletal changes due to erect posture with its present relevance and significance with its challenge and limitations

Address the demand of the questions properly
Follow the suggestion properly and model answer for more information
Keep writing all the best

4.) Femur shaft making 120° angle with femur head & development of linea aspera



5.) substitution of claws by fingers nail in 2nd or 3rd finger.

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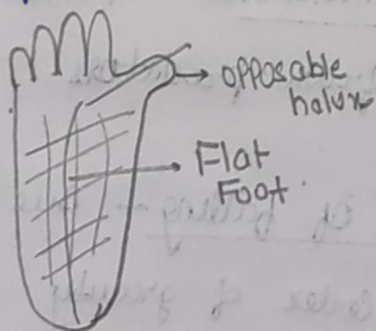
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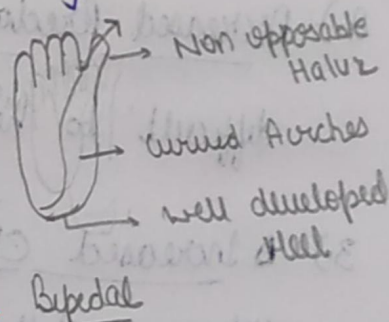
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6) Development of Tactile pads on feet to provide friction while moving

7) Non-opposable ~~Thumb~~ Hallux & arched foot for better load bearing



Knucklewalker



Advantages of Erect posture

1) Travel long distances efficiently & conserving energy (washburn).

2) Free Hands lead to

- ↳ Development of Tools
- ↳ Carrying of Infants
- ↳ Greater socialisation

3) Increased Visual surveillance.

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Limitations of Erect Posture

1.) Narrowing of Birth Canal → Has Made giving birth more complicated & painful.

2.) Decreased Predator Avoidance - Makes it difficult to hide from predators

3.) Increased Chance of falling → Due to upward shift of center of gravity

4.) Spinal problems → Due to spinal load bearing

Thus the erect posture while conferring several advantages has many limitations too.

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

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Primateology refers to the study of living & ancient primates - human & non human.

Primates are - "scenarhate, clavulate;
placental mammals with orbits encircled,
by bones; 3 kinds of teeth at least one
stage of life; brain always with a posterior
lobe & calcareum fissure; innermost digits
of at least one pair of extremities opposable,
hallux with flat nail or none; well developed
calcarum; penis percluous, testes scrotal
and "always two pectoral mammae".

Introduction is good and appropriate

(Muxart, 1873)

Role & Scope of Primateology In Anthropology

- 1.) Study the relation between living & Ancient primates
- (eg) → Study of primate Dryopithecus, a miocene pongid, revealed that D. major & D. africanus

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are ancestors of, Gorilla & Chimpanzee respectively

2.) Holistic study - Anthropology as a holistic science studies every aspect of humans in relation to whole (Primate)

Presentation and structure is good and appropriate
Contextual awareness is good and appropriate
Well organised systematic structure followed
Need to concentrate on the their role and scope in anthropological studies with challenge and limitations
Follow model answer properly for more information
Keep writing all the text

3.) Comparative Study - Anthropology aims to form universal laws about humans by studying various similarities & differences which separate & unite humans from other groups (Primates).

4.) Primate Social Behaviour - Studying primate social behaviour to understand human behaviour better

5.) - According to Jane Goodall similar to Chimpanzees, humans guard their teeth when angry.

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5) | Primate social organisation | → Understanding social evolution of human beings by studying social groupings, social decision making & social

The role and scope of primatology in anthropological studies are:

- To provide a comparative framework for studying human biology and behaviour. By examining the similarities and differences between humans and other primates, primatologists can identify the unique and shared features of our anatomy, physiology, genetics, cognition, communication, and sociality.
- Primatologists can also explore the evolutionary processes and environmental factors that shaped these features over time.
- To reconstruct the evolutionary history and phylogeny of primates and humans. By analysing the fossil record, the molecular data, and the morphological traits of living and extinct primates, primatologists can infer the relationships and ancestry of different primate groups and species.
- Primatologists can also estimate the timing and location of major evolutionary events, such as speciation, divergence, migration, and adaptation.
- To investigate the diversity and ecology of primates and humans. By observing and documenting the distribution, abundance, and variation of primates across different habitats and regions, primatologists can assess the biogeography and conservation status of primate populations and communities.
- Primatologists can also examine the interactions and adaptations of primates and humans to their natural and anthropogenic environments, such as food availability, predation, disease, climate change, and human activities.
- To understand the culture and society of primates and humans. By conducting field studies and experiments on the behaviour, learning, and cognition of primates in their natural and captive settings, primatologists can explore the social organization, cooperation, conflict, and culture of primate groups and societies.
- Primatologists can also compare and contrast the social and cultural phenomena of primates and humans, such as kinship, affiliation, dominance, reciprocity, altruism, morality, language, and religion.

7) | Social & Cultural Adaptation | - Free ranging primates exhibit social & cultural adaptation as seen in hominid ancestors.

8) | Conservation | → Study of each primate in detail has enabled us to take steps for their conservation & protection.

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The question of primatology within anthropology has been a blackship haunting primatology since the 1980's. However in light of all contributions made by primatologists to field of anthropology, all questions regarding primatology's place within anthropology should be put to rest.

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

10

Good attempt

Q7

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Homo Neanderthalensis or Neanderthal man refers to the fossil of the pleistocene hominid found in Neander Valley, Düsseldorf, Germany

Time Period - 0.2 mya - 0.03 mya.

Introduction is good and appropriate

Species / sub-species - Divided into 2 groups.

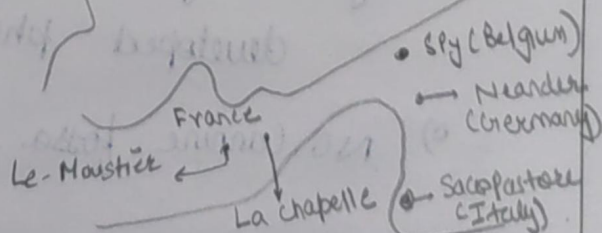
(i) Classical - closer to Homo erectus
eg - La Chapelle Man

(ii) Progressive - closer to H. sapiens
eg - Mt. Carmel Man

Geographical Distribution

1st fossil found composed of a cranium, ulna, right shoulder blade, left thigh discovered by Johann C. Fuhlrott in 1856 in Neander Germany.

Europe →



FD

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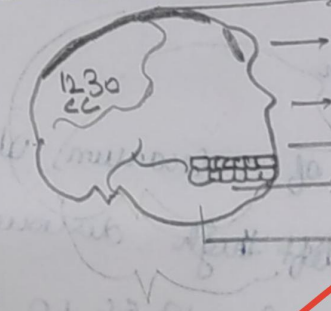
Enter Number of Question

- Q) Near East & Central Asia
 - Galilee (Palestine)
 - Jerik-Jarck (Iran)
 - Amud Coes
- Q) Africa - Florusabad (South Africa),
Jactoli (Kenya), Singa (Sudan)

Address the demand of the questions properly
 Need to concentrate on the thier debate with challenge and limitations
 Follow model answer properly for more information
 Maintain the same consistency
 Keep writing all the best
 Add it's present relevance and significance

Q) No evidences of Homo from East & South East Asia.

Physical Features



Thick, Low, flat, skull
 Supra orbital torus

Broad nose
 slight prognathism
 No chin

Massive jaws

Other features -

- Q) Sylvian fissure in Brain but poorly developed pharynx
- Q) NO canine fossa.

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Enter Number of Question

Post cranial

- o) 5ft + tall
- o) Heavily muscled neck
- o) Teres muscle well developed indicating throwing capabilities
- o) short & stout bones -
- o) Femur - strong with large head -

Cultural Features - Mousterian Culture

- (1) 1st to have control over fire
- (2) Diversified tool technology with varied traditions Eg - Mousterian Hand axe.
- (3) Rituals, were first evidenced
Eg - Teshik-Tash - Burial with goat heads.
- (4) Poorly developed Language due to incomplete development of pharynx
- (5) ~~the~~ clothing - presence of bone Needles.

Phylogenetic position - Debate

- o) The phylogenetic history of Neanderthal is muddled with conspiracies such as -

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Enter Number of Question

(1) La-Chapelle man wasn't fully erect & walked bent forward.

Conclusion - La Chapelle man had arthritis which caused bent bones.

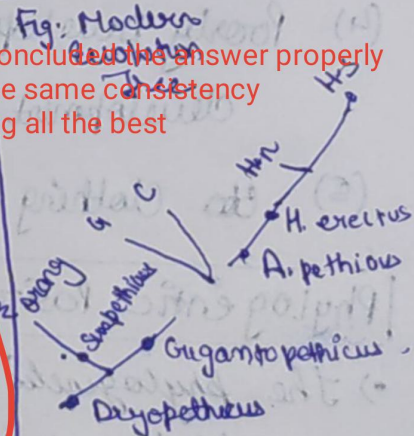
(2) Estimated age of neanderthal 18-20 years but La Chapelle Man was 40 years

Conclusion - Homo neanderthals had a very strong social organisation which took care of old, young & sick

(3) Classical neanderthals had ecological specialisation for cold climates

Conclusion - They had no such specialisation as evidenced from fossil finds in Skhul which had a warm climate

Thus on basis of following conclusions & molecular biology it has been proven that H.s & H.n split from common ancestor occurred around 0.8 mya & they evolved as cousin species ~ 0.4 mya



You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

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Enter Number of Question

Archaeology refers to the study of cultural remains - artifacts, fossils, rocks, etc - in order to get a better understanding of the past.

Introduction is good and appropriate

Dating Methods refer to techniques used in archaeology, geology and other scientific disciplines to date primitive findings.
Dating Methods are of two types -

- 1) Relative
- 2) Absolute

Relative Dating Methods

All those techniques which involve a comparative study of archaeological find before giving it a date sequence.

They are of 3 types -

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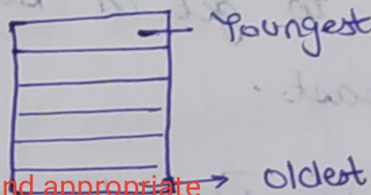
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Enter Number of Question

1.) Stratigraphy

o) In many archaeological sites, evidence may be placed in a chronological order



Presentation and structure is good and appropriate
 Contextual awareness is good and appropriate
 Well organised systematic structure followed
 Need to concentrate on the thier types with present challenge and limitations
 Address the demand of the questions properly
 Follow the suggestion properly and model answer for more information
 Keep writing all the best

- Fast

o) Disadvantages

- Not possible in case ground has been disturbed by natural forces
- Very difficult in River valleys.

2.) Fluorine Dating

- o) Many natural water sources contain fluorine which gets accumulated in bones & teeth
- o) Older the fossil, greater the fluorine content

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Enter Number of Question

o) Advantage - Dating of fossil found together/nearby
↳ Dating of fossil that do not belong to a particular stratum.

o) Disadvantage - Rate of Fluorine accumulation varies from one region to another.

Dating methods in archaeology have various challenges and limitations, such as:

3) Pollen Dating -

o) Dating of fossils by correlating it to a climatic period through the study of fossil pollen.

o) Advantage - Pollen dating is used for a wide range of materials up to 50,000 years old, but low precision for materials older than that. Dendrochronology may have high precision for wooden samples from certain regions and periods, but low accuracy for samples from other regions and periods.

o) Disadvantage - Calibration and correction. Dating methods may require calibration and correction to account for various factors that may affect the results, such as environmental changes, contamination, or human errors. Calibration refers to the process of adjusting the estimated date to match a standard or reference chronology, such as the calendar year or the solar year. Correction refers to the process of removing or reducing the effects of unwanted or interfering factors, such as isotopic fractionation, atmospheric variation, or laboratory contamination.

Absolute Dating

o) Provide an exact date of the archaeological find with a margin of error.

o) Types

1) Dendrochronology -

→ In certain climates trees grow rings on their trunk every year

→ In area of seasonal rainfall, each ring represent 1 year of growth

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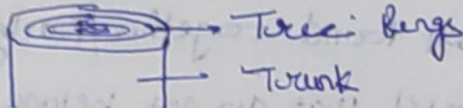


Fig: Dendrochronology

2.) Carbon Dating

- 1) Most popular form
- 2) Every living organism absorb C-14 from atmosphere which decay into stable C-12 at specified periods of time (Half life of C-14 - 5568 yrs)

- 3) When organism dies, intake of C-14 stops & C-14/C-12 ratio declines.

- 4) Advantages
 - 1) Very accurate
 - 2) Can be used to date finds up to 50000 years

- 5) Disadvantage
 - 1) Formation of C-14 differs due to alteration of solar radiation & shift of earth's magnetic fields
 - 2) Can't be used for dating older than 50000 yrs.

Other Absolute Dating methods → Amino Acid

Racemisation & Potassium - Argon Dating.

You have conclude the answer properly

Maintain the same consistency

These dating techniques are an essential part of Archaeology which have helped us track the origin & evolution of earth.

Q1

PART - II .

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Answer Question in NOT MORE THAN the word limit specified for each in the parenthesis
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Enter Number of Question

Darwin in his theory of natural selection could not answer these major questions -

- (1) What causes variation
- (2) How variations spread
- (3) What limits variation

Introduction is good and appropriate

In order to answer these questions, the supporters of Darwin came up with synthetic theory.

Proponents - Gil. Stebbins, Huxley, Simpson, Dobzhansky, Meyer etc.

Factors In synthetic Theory

(1) Gene Mutation - sudden change in genetic material.

Eg -> Change from Glutamic Acid to Valine in β -Chain of Amino Acid \Rightarrow HbA \rightarrow Hbs.

(2) change In Chromosome number - This can happen due to aneuploidy or Euploidy,

Eg - Trisomy 21 \rightarrow Down's Syndrome

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Enter Number of Question

(3) Genetic Recombination - change in arrangement of Genes on the chromosome.

(4) Natural selection - differential reproductive success ~~and~~ across multiple generations of given population of ~~man~~ or animal (Craig Stanford et al 2014)

(5) Isolation - Geographic, Cultural or Genetic leading to Inbreeding

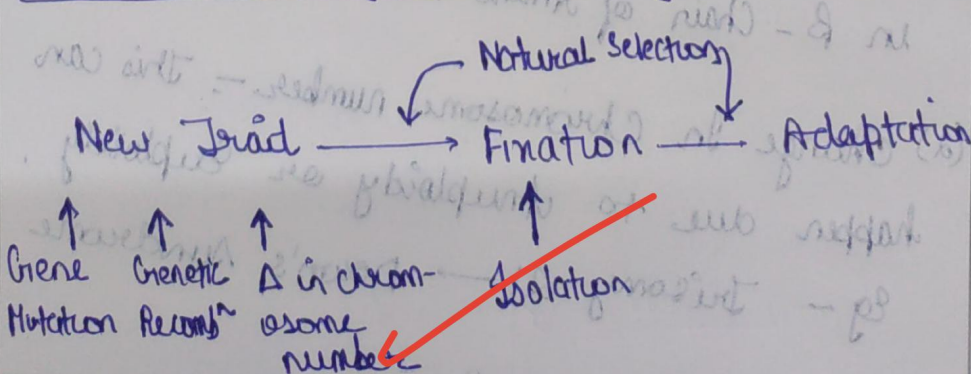
(6) Hybridisation - ~~Mating outside a Mendelian population~~

Presentation and structure is good and appropriate
Contextual awareness is good and appropriate
Well organised systematic structure followed
Maintain the same consistency

(7) Migration

Need to concentrate on the it's present relevance and significance with it's challenge and limitations
Maintain the same consistency

(8) Genetic Drift - ~~change in gene frequencies without any effect of mutation or natl. selection.~~ Eg - Retinitis Pigmentosa.



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Enter Number of Question

Critical Evaluation

Positives

- (1) Most Elaborate & evidenced backed.
 - (2) Draws best elements from Lamarckism & Darwinism
 - (3) Has stood the test of time
 - (4) Explains both micro & macro evolution
- Significance and Impact:
- The Modern Synthetic Theory of Evolution has significantly strengthened the field of evolutionary biology by providing a unified framework that combines Darwin's ideas with modern genetic principles.
 - This synthesis has led to a more comprehensive and detailed understanding of the mechanisms underlying evolutionary processes. It has also facilitated the integration of various subfields, including palaeontology, genetics, and developmental biology, into a cohesive narrative of how species originate, diversify, and change over time.

Negatives

- (1) Emphasizes only evolution as it has happened in the past, not how it will happen in future
- (2) Gives undue importance to Migration, Genetic recombination & change in chromosome number
- (3) Undermines importance of Genetic Drift.

However, despite all of its criticisms synthetic theory is the best among all other theories of evolution.

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

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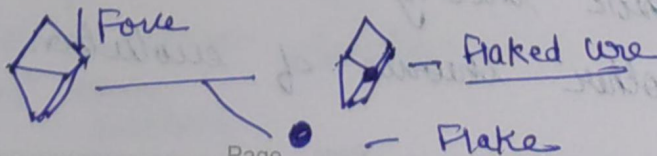
For the longest time Tool making was
considered to be a solely & exclusively
human trait. However the recent
finding of Jane Goodall about tool
making abilities of Chimpanzee has
sparked a new debate.

Introduction is good and appropriate

Evolution of Tool Technology

- 1.) The first individual to have a tool culture was - Australopithecus. However he had an ~~oste~~-Dento-Keratic culture wherein bones & antlers were used as tools.
- 2.) The first perennial stone tool maker was H. erectus. The various tool technologies used by H. erectus include -

1.) Direct percussion



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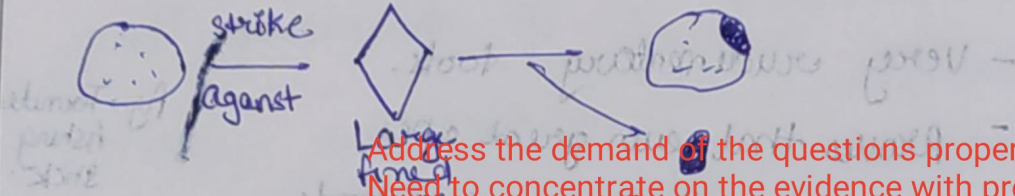
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2.) Block on Block



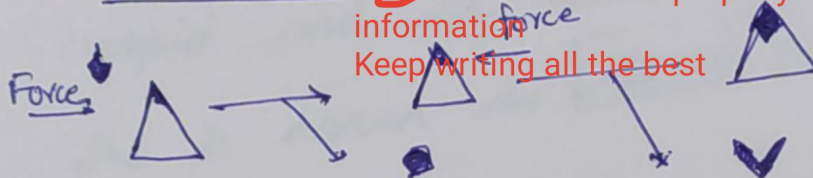
Address the demand of the questions properly
Need to concentrate on the evidence with present relevance and significance

Maintain the same consistency

Follow model answer properly for more information

Keep writing all the best

3.) Glaucian



This is called the ~~A~~ Lower Paleolithic Culture
Consisting of ~~stone~~ Abulian & acheulian
cultures

3.) Mousterian culture of H. neanderthals
which utilised techniques like Levallois
flake & pecking.

4.) This was followed by culture of
Homo. Sapiens

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Enter Number of Question

Termites - Fishing Tools of Chimpanzees

- Very rudimentary tools.
- Proves that even great apes evolved methods to make tools.

Ag → Termites fishing stick.

4

Conclusion is missing
Maintain the same consistency
Keep writing all the best

- Trying to untangle how chimpanzees in the Congo Basin acquire complex tool tasks, University of Miami biological anthropologist Stephanie Musgrave screened thousands of hours of video that recorded visits to termite nests, including those by forest elephants, leopards, and gorillas, in the Republic of Congo's Goulougo Triangle
- "Chimpanzees have the most complex tool behaviours of any animals outside of humans, so studying how their youngsters become proficient at these tasks can help us better understand how early humans might have acquired complex technological skills," said Musgrave, an assistant professor in the Department of Anthropology
- Figuring out how tool traditions are passed on and how this differs within and between species, Musgrave said, could help humans understand the emergence of cumulative culture during our own evolution.
- One of the key features of human culture is its remarkable complexity. It's what we call cumulative. Meaning that ideas and innovations accumulate over time, such that new generations inherit and learn to use technologies that are far more complex than any one individual could invent.
- Comparative studies give us insights into how technology came to be a defining aspect of human evolution.

03

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Answer Question in NOT MORE THAN the word limit specified for each in the parenthesis
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Enter Number of Question

Evolution is defined as change in the genetic frequencies of an organism.

However, evolution is not a uniform process but is asymmetrical - sometimes rapid and at other times slow.

This is known as Mosaic evolution

Introduction is good and appropriate

Mosaic Evolution - Human Beings

Key points about mosaic evolution include:

• **Trait Independence:** Mosaic evolution suggests that traits in an organism are largely independent of each other in terms of their evolutionary trajectories. This means that one trait can evolve rapidly while others remain unchanged or evolve at a different pace.

• **Selective Pressures:** The variation in the rate of evolution for different traits is often attributed to varying selective pressures. Traits that are subject to strong natural selection or environmental changes may evolve more rapidly to adapt to new conditions.

• **Fossil Evidence:** Mosaic evolution is often observed in the fossil record. Fossils of ancient organisms may reveal that some features changed significantly over time while others remained relatively constant. This pattern can help scientists reconstruct the evolutionary history of organisms.

• **Examples:** Mosaic evolution can be seen in many different organisms. For example, the evolution of the human lineage includes mosaic changes in brain size, bipedalism (walking on two legs), dentition, and tool use. Each of these traits evolved at its own pace in response to different selective pressures.

• **Evolutionary Trade-offs:** Mosaic evolution can lead to trade-offs between traits. For instance, an adaptation that benefits one aspect of an organism's life may come at the cost of another trait. These trade-offs can shape the overall evolutionary trajectory of a species.

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Answer Question in NOT MORE THAN the word limit specified for each in the parenthesis
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Enter Number of Question

Significance of Mosaic Evolution

(i) Plays a very important role in Macro evolution.

(ii) Helps us observe differential impact of natural selection on individual traits

Presentation and structure is good and appropriate
Contextual awareness is good and appropriate
Well organised systematic structure followed
Need to concentrate on the significance of the theory with it's present relevance and significance with it's challenge and limitations

(iii) Helps us to understand fossils such as 'Pitohui theory'

(iv) By understanding the step wise evolution of an adaptive trait we can understand its importance which is crucial for conservation.

(v) A single similarity between two fossils is not enough to make generalisation. The whole pattern of evolution

27/11

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Enter Number of Question

must be analysed.

6
Good attempt

(ii) Analyse evolution of adaptive features
Eg -> Feathers of Bird developed for insulation
but through mosaic evolution ~~was~~ enabled
flight & camouflage abilities.

This mosaic evolution has greatly enhanced
our knowledge about evolution. There
is a need to study it further, so
as to benefit more from the concept.

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

04

UPSC

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Answer Question in NOT MORE THAN the word limit specified for each in the parenthesis
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Enter Number of Question

~~The entire cultural debris recovered from the Pleistocene epoch is known as palaeolithic culture. The third & conclusionary stage of the stone age is known as neolithic culture. It is characterised by the introduction of skilled agriculture and an advancement in tool technology & tools.~~

Introduction is good and appropriate

Time Period - 9000 BC - 4000 BC.

Climate - The end of ice age made the climate warm & dry. As a result snow covered tracts of land were now covered by dense forests.

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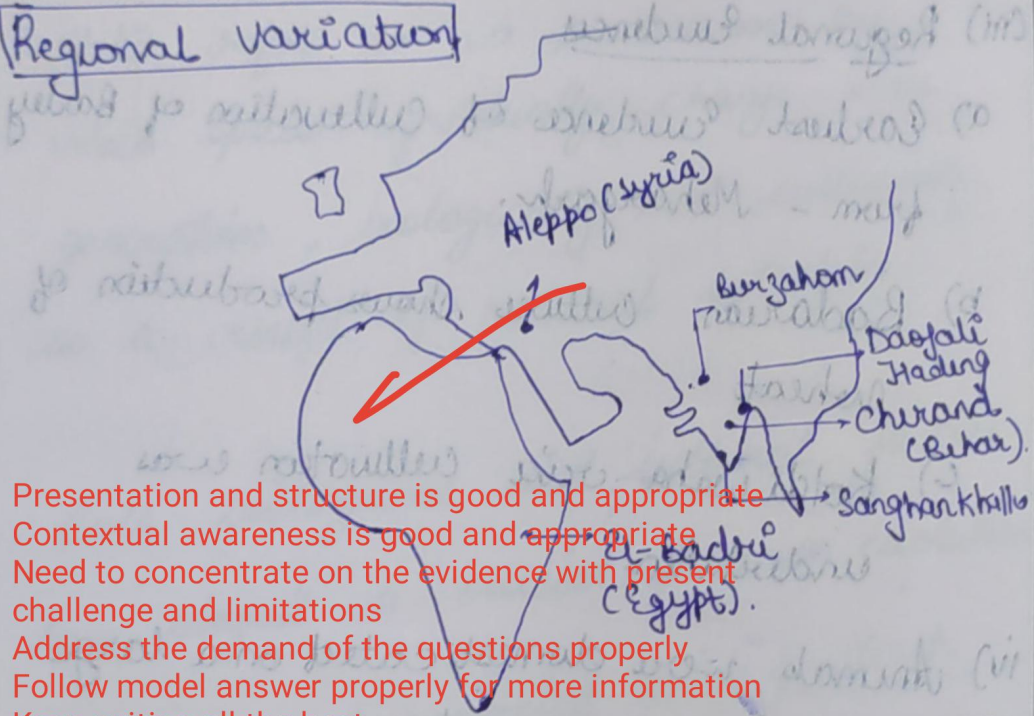
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(Specimen Answer Booklet - For Practice Purpose Only)

Enter Number of Question

Regional variation



Presentation and structure is good and appropriate
Contextual awareness is good and appropriate
Need to concentrate on the evidence with present challenge and limitations
Address the demand of the questions properly
Follow model answer properly for more information
Keep writing all the best
Maintain the same consistency

Food Production During Neolithic Culture

It is evidenced from the following :-
(i) Microliths were replaced by Cells - Ame, Adze, etc to clear forests for cultivation.

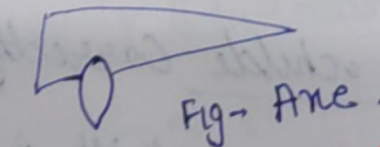


Fig - Ame.

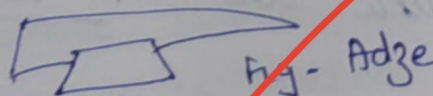


Fig - Adze

(ii) Evidence of pottery & Pot shreds from all neolithic sites.
Eg - Pottery was very sophisticated in Chirand, Bihar

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Enter Number of Question

(iii) Regional Evidence

a) Earliest

from - Mehrgarh

b) Badarian

wheat

c) Indus

(iv) Animals

scale for their produce.

v) Political systems emerged for protection of surplus grains

vi) sudden rapid increase in population

Thus V.G. child correctly refers to the Neolithic as "1st Revolution in the history of mankind"

The Neolithic period is known for the agricultural transformation and for changing many human cultures from nomadic lifestyles to sedentary ones.

- The earlier societies depended on nature for their subsistence and this period started the change of relation between man and nature from a man living at the mercy of nature to man exploiting nature.
- The man started growing food crops, and domesticated animals and the growing of crops changed his life to sedentary.

- The surplus production required storage which was done in pottery.
- The reliable food source also encouraged the population size of societies as it can support more numbers and this increase in size led to complexity in social structure and an increase in the specialization of labour.

- The presence of microliths, stone blades, and stone axes, is recorded in almost all places - more advanced tools

- It stone built houses, houses made of wattle and daub with local mud and mud brick houses which were most common.

- domestication of animals • In South Asian context, Mehrgarh has yielded evidence of barley and wheat cultivation, and cattle, sheep, and goat domestication. Recent excavations at the site of Lahuradeva in Uttar Pradesh have brought to light early dates for rice cultivation in India.

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

DS

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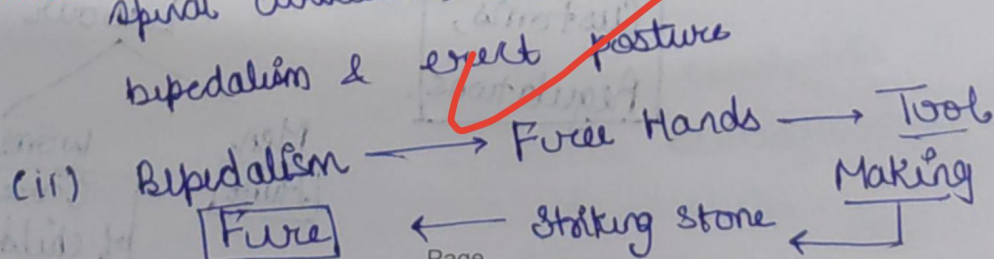
Evolution refers to a phenomenon by which species gradually change over generations, biologically and culturally, as a result of natural selection.

Introduction is good and appropriate

Both biological and cultural factors have played a crucial role in evolution. They are interconnected in a feedback loop where the occurrence of one factor, such as change in the other (Richerson & Boyd).

Some examples of biological changes that made human beings capable of making culture are:

1. The expansion of the cerebral cortex, especially the frontal lobe, which is responsible for higher cognitive functions such as problem-solving, planning, reasoning, and social interaction. This biological change allowed humans to think abstractly, invent symbols, and communicate complex ideas.
2. The modification of the vocal tract, the larynx, and the tongue, which enabled humans to produce a variety of sounds and articulate speech. This biological change facilitated the development of language, which is a key cultural feature that allows humans to share information, coordinate actions, and express emotions.
3. The evolution of bipedalism, which freed the hands for manipulating objects and making tools. This biological change gave humans an advantage in hunting, gathering, and exploring new environments. Toolmaking is also a cultural activity that requires skill, creativity, and social learning.
4. The reduction of aggression and the increase of cooperative tendencies, which resulted from both genetic and cultural factors. This biological change helped humans form stable social bonds, establish norms and values, and cooperate for mutual benefit.



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Enter Number of Question

(1) Bipedalism also allowed man to travel long distances efficiently → Hunting

(2) Expansion of Brain

(i) Hunting added to new experiences, creating pressure on brain → Brain Expansion.

(ii) Brain Expanded → Development of Language

(iii) Brain Expanded → Difficulty in Giving Birth

↓
Prolonged Infancy.

↓
Mother - Child Bond.

↓
Need for Female

↓
Male - Female Bond

Marriage,
Customs,
Regulations.

Divisions of Labour

Men
Hunt

Women
Care of child

Presentation and structure is good and appropriate
Contextual awareness is good and appropriate
Well organised systematic structure followed
Need to concentrate on the biological changes that made human being to make culture
Add it's present relevance and significance with it's challenge and limitations
Follow model answer properly for more information
Keep writing all the best

UPSC

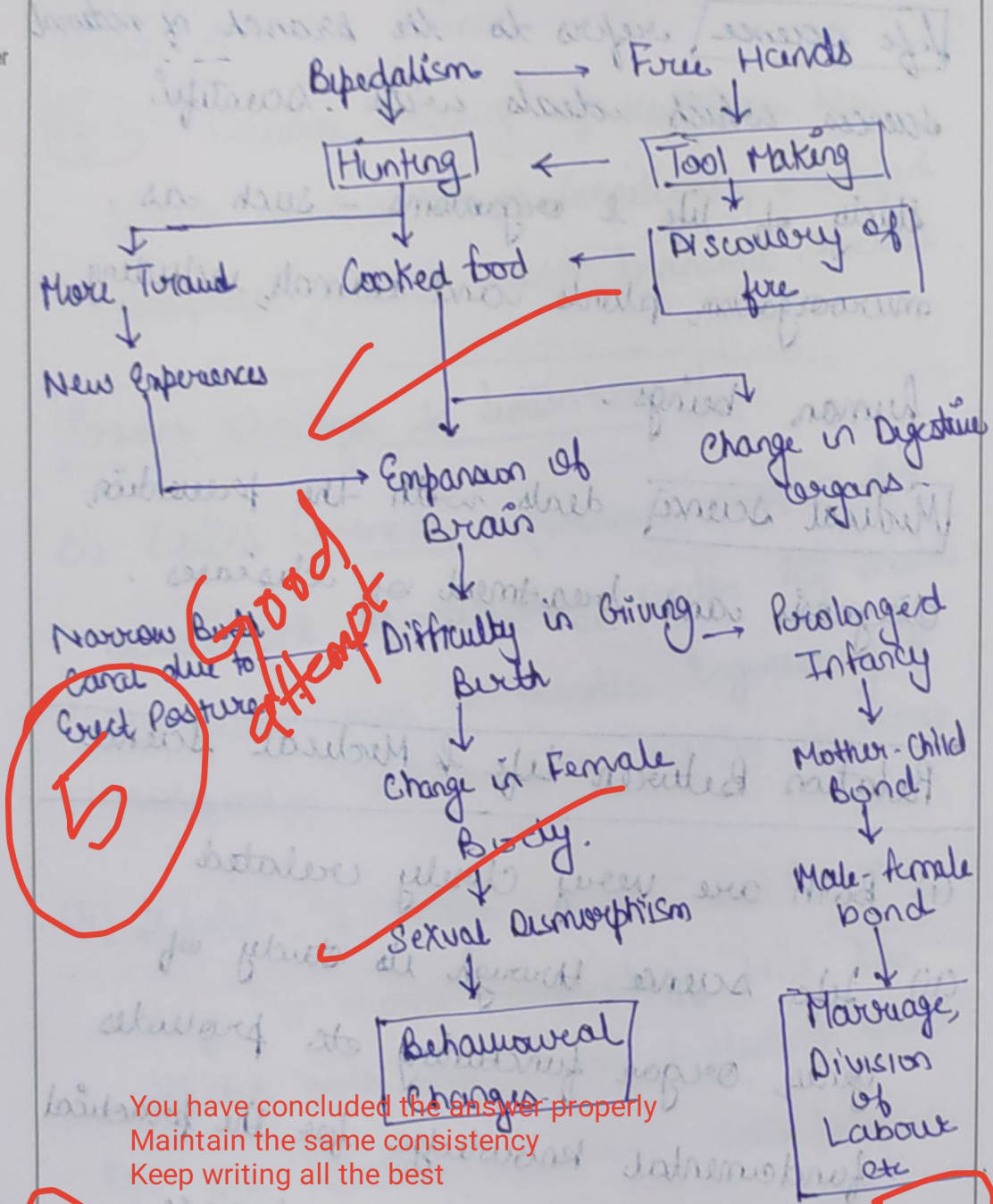
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Enter Number of Question



5

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best

Thus without biological evolution there would be NO cultural evolution & without cultural evolution biological evolution would be limited & slow

Please do not write anything except the Question number in this space

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Answer Question in NOT MORE THAN the word limit specified for each in the parenthesis
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Enter Number of Question

Life science refers to the branch of natural sciences which deals with scientific study of life & organisms - such as microorganism, plants and animals, including human beings;

Medical science deals with the prevention, diagnosis and treatment of diseases.

Relation Between Life & Medical Science

- (i) Both are very closely related
- (ii) Life science through its study of genes, organ functioning etc provides fundamental knowledge for the practical application of Medical science.

Eg → Genome Mapping under life science has enabled the development of CRISPR-CAS

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Enter Number of Question

Under Medical science
(Eg-2) - Genome Mapping of Mosquitoes has led to development of Genetically Modified mosquitoes which ~~can't~~ transmit diseases.

Present challenges & Limitations.

(i) Critical Concepts - Genome Mapping & Genetic Engineering
Presentation and structure is good and appropriate
Contextual awareness is good and appropriate
Well organised systematic structure followed
Need to concentrate on the significance of the each with it's present relevance and significance with it's challenge and limitations
Maintain the same consistency
Keep writing all the best

(ii) Lifestyle of Modern world - led to a change in Human physiology that has affected both life science & Medical science
Eg -> Anti-Microbial resistance calls for study of Microorganisms as well as development of stronger medicines.

UPSC

Please do not write anything except the Question number in this space

Answer Question in NOT MORE THAN the word limit specified for each in the parenthesis
Content of the Question is more important than length.

Candidates must not write on this margin

(Specimen Answer Booklet - For Practice Purpose Only)

Enter Number of Question

(iii) Poor Infrastructure & Funding

(iv) Shortage of Skilled Manpower

Life sciences & Medical sciences are the most crucial sciences especially

in the backdrop of a global pandemic like COVID-19. We must

quickly transform all present challenges into future opportunities

to ensure a healthy, sustainable & peaceful world.

5

You have concluded the answer properly
Maintain the same consistency
Keep writing all the best