71019 (1229)

GS SCORE

TEST - 02

115.5

ANTHROPOLOGY

Time Allowed: 3 *Hrs.* *Max. Marks:* 250

Instructions to Candidate

- There are FIVE questions. All Questions are compulsory.
- Answers must be written in the medium authorized in the Admission certificate which must be stated clearly on the cover of this Question-cum-Answer (QCA) booklet in the space provided. No marks will be given for answers written in medium other than the authorized one.
- Word limit in questions, wherever specified, should be adhered to.
- Attempts of questions shall be counted in chronological order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the answer book must be clearly struck off.

Name G.V.S. PAVANDATTA

Mobile No. _____

Date _____

Signature _____

1. *Invigilator's Signature* _____

2. *Invigilator's Signature* _____

REMARKS

GS SCORE

Roll No.

Roll No._____

GS SCORE

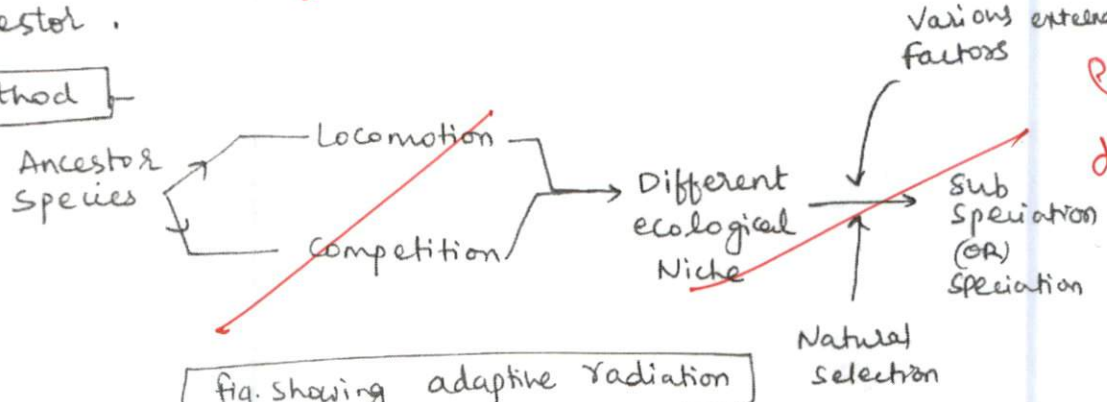
1. (a) Adaptive radiation in primates. (150 Words) (10)

Adaptive radiation is a phenomenon which occurs in macro evolution.

Good Introduction

Buettner Janusch – defines adaptive radiation as the number & types of diversifying organisms formed in different ecological niches due to a common ancestor.

Method –



Good depict

fig. showing adaptive radiation

Adaptive Radiation in Primates:-

– It can be emphasised by phylogeny.

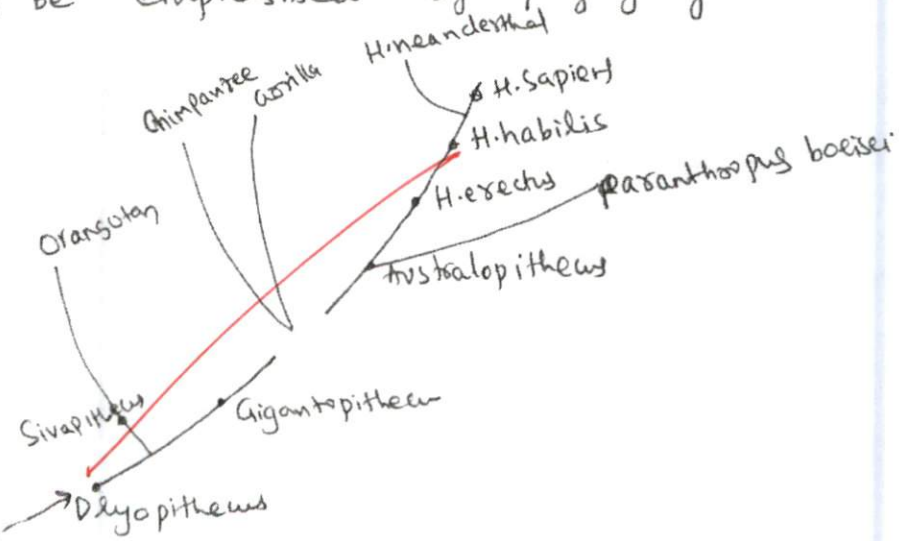


fig. showing Homo-Sapiens Taxonomy

Remarks

- Primates being mammals adapted to arboreal adaptation & later to terrestrial radiation.

Also highlight various features of adaptive Radiation

Conditions required for adaptive Radiation:-

① New Ecological Niche

eg:- Mammals → Aequatic Environment → Whales, dolphins etc

② Relative Isolation of new species etc.

Factors used to identify adaptive radiation:

① Trait utility

② Ecological – Trait continuity

③ Immediate ancestral species etc.

— results in evolutionary changes

Anthropological significance:-

It formed bedrock principle for cultural-ecology model of Julian Steward. It also became significant for many ethno-archeological studies.

Correlates with Context

4.5/10

Remarks

1. (b) Pedigree Analysis (150 Words) (10)

The principles which govern the heredity & transmission of genetic traits across generations are called as genetic principles.

Opt introduction

Pedigree Analysis is one of the methods to study genetic principles.

Main proponent :- Galton.

Explanation :- It is the method in which the trait inheritence is studied across generations by using certain specific symbols.

Symbols are :-

- □ → Man
- ○ → Female
- ∅ → dead
- ▤ → affected
- □—○ :- Marriage
- □=○ :- Consaguinous marriage
- ◇ = Unspecified sex

etc

Example :-

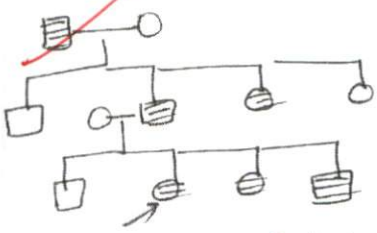


Fig. showing :- Autosomal dominant Inheritence.

Draw separate Diagram for to exhibit dominant & Recessive Gene seperately.

Advantages | Application.

① Cost effective when compared to other methods like :- DNA Profiling etc

Remarks

Relevant points

② Helpful in Mendelian inheritance studies.

③ Can be used in Paternity dispute.

④ Can know exact inheritance pattern of some somatic & genetic inheritances

⑤ Helpful in Genetic Counselling.

Limitations:-

① Not accurate

② Some genetic diseases are due to sudden mutations which are abrupt & not known to occur through proper inheritance pattern.

Good

③ Errors are more.

④ Is generally used after affecting because presentation is rare in some diseases.

Also highlight the contribution and impact of the environment

Anthropological Significance:-

Pedigree analysis helped in certain methods to study in ethnography. This paved way for Genealogy method which was initiated by W.H.R. Rivers during Torres strait expedition.

Thus, Pedigree method is very helpful in genetic studies.

Remarks

4.5/10

1. (c) Cro-Magnon (150 Words) (10)

Modern human sapiens have lived across the globe since ~~Lower~~ Upper paleolithic period. Cro-Magnon was ~~the~~ of the archaic-human species.

Good Introduction

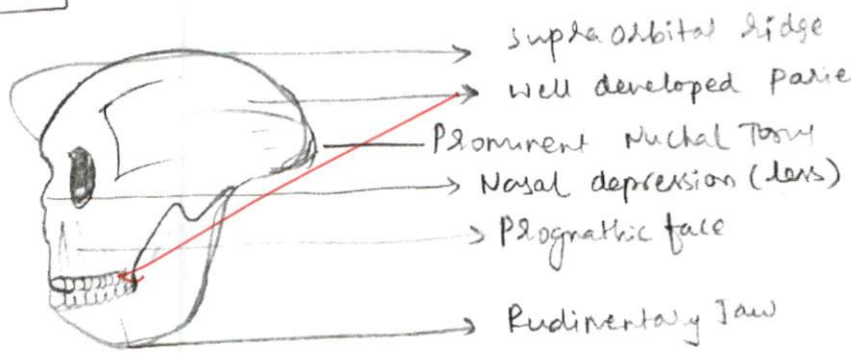
Climate – Interglaciation & glaciation period

Time period – ~~to~~ Upper paleolithic period (~40,000 – 10,000 years ago)

Geographical distribution – Fossils dated were found in Cro-Magnon, France (Western europe).

Discovery by – Lartet, 1808.

Features



Good

Fig. Showing Cro-Magnon man

Skull: The features are present as mentioned in the above figure.

Also Add skull measures large – dolichocranic skull.

Cranial capacity: 1550–1600 cc

Remarks

Dentition:

① No diastema
② Posterior dental arcade is very parabolic
③ Teeth are small, close to modern humans.

Post cranial features:

① Femur is strong, with linea aspera
② Hip is widened for easy transmission of weight.
③ Lumbar curve is well marked.

eg:- Femur.

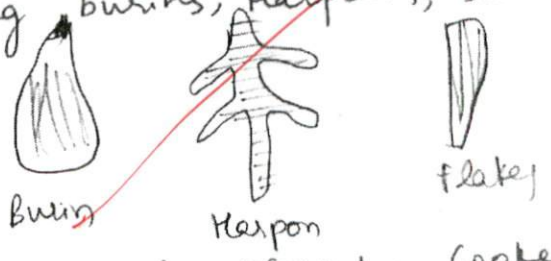
Good

Relevant points

Culture —

① Aurginacean Culture:

Showing burins, Harpoons, blade tools, flakes.



② Group hunting is present. Cooked food is eaten (Because of evidence of fire)
③ Shelters are found. Burial practices are wide.

Thus Cromagnon man that is accepted as archaic homo sapiens.

Well conclude

Anthropological significance:- The discovery of cromagnon fossil has helped for the strong knowledge about archaic homosapiens.

Remarks

5/10

1. (d) Foster Child. (150 Words) (10)

~~Ge~~ Principles which are used to study genetic ~~of~~ transmission of characteristics/ traits from generation to generation are called as Genetic principles.

Start with Foster child definition.

Foster child is one of the methods to study genetic principles.

Method

Random selection of children from various social & genetic backgrounds

↓

Controlled observation in studies

Eg:- children studied under → Good / average / poor homes

↓

Study the "Nurture" on the children.

Eg:- IQ data

↓

Coming to Conclusion

Relevant in the context of genetics

Case Study:-

Chicago studies:- To study I.Q in children, the children are randomly selected & reared in good average & bad homes.

Remarks

IQ	Home
96 =	Good Home
92 =	average Home
70-80 —	Bad Homes

This emphasised that the "Nurture" (or) environmental component also plays huge role in some mental traits.

Good

Minnesota study → Some children are studied. People are selected from Managerial & labour classes. IQ is lesser in children of labour class but higher in the managerial class. When children are shifted to managerial class from labour, their IQ has increased.

Limitations of the method:

Also Add does not specify the environment factor

① Sample selection is some what biased in nature (Majority percentage)

② Some children may develop other untoward characters due to genetic effects

Anthropological significance:

— This method helps in Nature - Nurture debate so that Molecular anthropology which also deals with Eugenics may get some help from it.

~~It~~ Thus, foster child method helps in studying genetic principles of man.

Well Concluded

Remarks

4.5/10

1. (e) **Biological and cultural factors in Human Evolution** (150 Words) (10)

Ford et al has classified Human evolution as Bio-cultural evolution.

Introduce with emergence of human being as confluence of environment & hereditary

Biological Factors ⇌ cultural Factors.

(i) Biological Factors helping in cultural evolution:-

Bipedalism & erect posture → Ability to do things freely by upper limbs → development of culture → Tool making

(ii) Hyoid complex:-

Hyoid complex development → Speech & language development → Social behaviour → Social complex system

Increase in Frontal, Parietal lobes → Cognition → Speech & language development

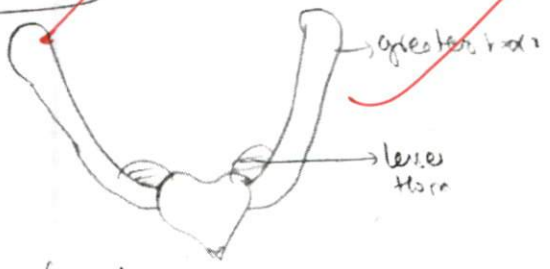


fig. Hyoid complex

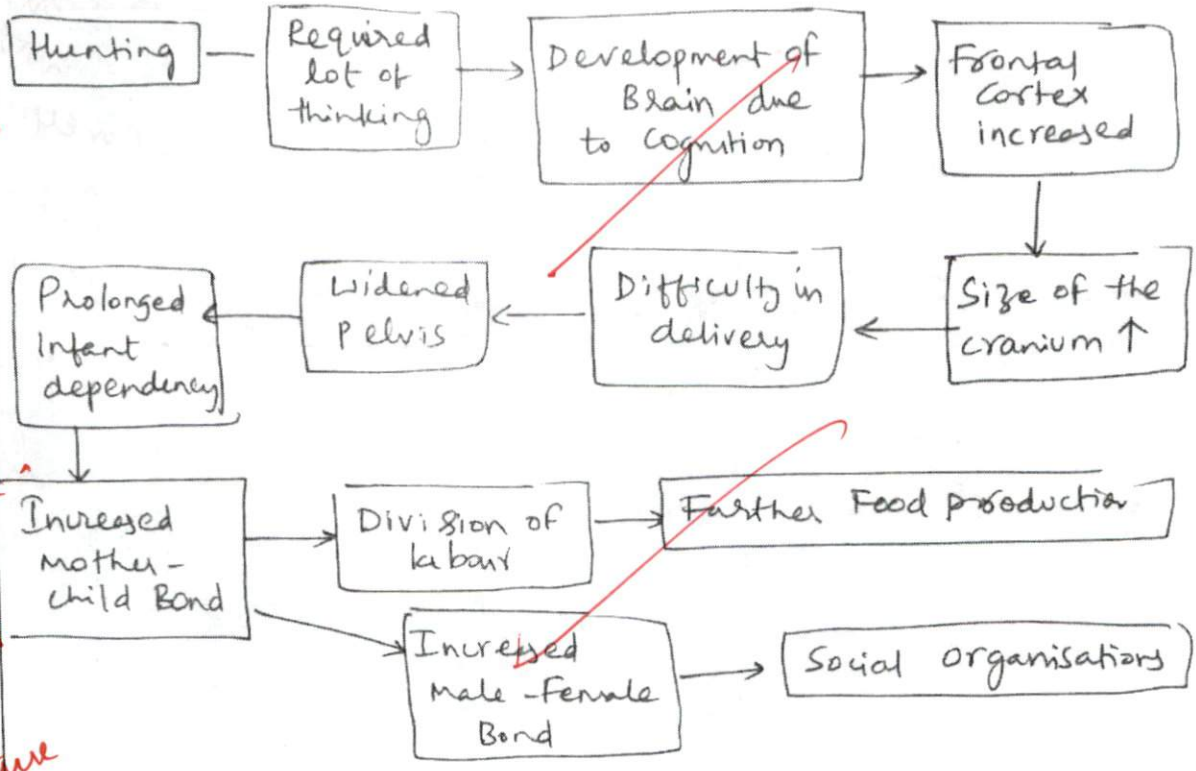
fig. femur - linea aspera

Good depiction

Also Add change in dentition

Remarks

Cultural factors influencing biological factors:-



Good

Also Add Novel Innovations like Agriculture - food security.

Both biological & cultural factors has helped man to attain present shape.

Anthropological significance:- Studying bio-cultural factors in human evolution gives us ideas about the various situation in the ancient era & helpful for cross cultural studies; museum methodologies & paleontological anthropology..

5/10

Remarks

2. (a) Discuss the evolutionary significance of bipedalism and erect posture.
(200 Words) (15)

While the evolution of man occured from apes, the most important character that changed the life of man was bipedalism & erect posture.

Bipedalism & erect posture →

Changes happened for bipedalism & erect posture are:-

① Skull:-
Foramen Magnum has come more downwards for further weight bearing & steadiness.

Evolutionary significance:-
Man was able to walk freely and so developed culture. The foramen magnum evolution has helped for correct weight transfer.

② Teeth / Dentition:- Skull changes turned into dentional changes also when the raw cooked food was changed into cooked food. It requires less energy.

③ Spine:-
Older / ancient primates have only 2 bent curves in spine. where as man has 4.

Not introduction

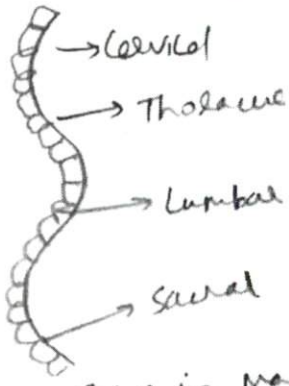
Relevant in the context of question

Avoid cutting

Remarks

Good depiction

Spine in Apes.



Spine in Man

Evolutionary significance:-

Also include change in PELVIC GIRDLE. - FEMUR

Lumbar curve helps to transfer the weight accurately from the Head to the Knees & then foot.

Hip - Hip has widened considerably for the weight transmission.

with evolutionary significance

Knees -

Knees have become broad & Hyaluronic acid has been the main say in maintaining the proper axis of weight across the body.

Feet - Arched feet helpful for proper coordination

Arched foot in Man

Remarks

Thus, these changes which occured from Homo erectus to modern man has helped for further evolution of man.

Good

Erect posture & Bipedalism → Helpful to make tools & other case arts etc → Development of culture → Helpful in further biological evolution

Disadvantages of bipedalism & erect posture:-

① Some conditions like arch less foot produces severe pain
② Erect posture produces severe backaches in some
③ More proned injury to spine.

As per questions case demand No need to mention

But, huge evolutionary significance is present in the bipedalism & erect posture of man which helped for further expansion of human race

Without of this highlight cultural significance of these changes
- fire production & cook food etc

Remarks

7.0/15

2. (b) What is a Mendelian population and Hardy-Weinberg equilibrium. What is the explanatory value of these concepts in the field of anthropology. (200 Words) (15)

Good introduction to the point

Dobzansky has defined Mendelian population as the cross-fertilising individuals in single gene pool.

Stewall Wright has defined it as the population group which follows mendelian inheritance.

So, it is an aggregate group of population which share a common gene pool.

Characteristics
- Random mating
- Non-restricted gene flow among the population
- Preferable Isolated.
- No mutation
- No biased random mortality

Relevant in the context of question

Hardy Weinberg equilibrium:-

It is a mathematical expression which is used to study genetic frequencies of the population gene pool under ideal mendelian conditions.

eg:- Let p is frequency of allele [A] = p

Let q be the frequency of allele [a] = q

$[A] + [a] = 1$

$\boxed{p + q = 1}$

$AA = A^2$

$aa = a^2$

$Aa =$

Remarks

Also in introduction part explain mendelian population further its other aspects

Then the genotype occuring in the population under random mating is $p^2 + q^2 + 2pq = 1$.

Also supplement with relevant examples

	0.5p	0.5q
0.5p	$0.25p^2$	$0.25pq$
0.5q	$0.25pq$	$0.25q^2$

$p^2 = 0.25$
$q^2 = 0.25$
$2pq = 0.5$

→ frequency of alleles in the population.

Explanatory value of these concepts in anthropology:-

① Helps us to know about the direction of evolution:

(1.1) By knowing the allelic frequency and total population, one can know about the evolution direction & selection according to the nature.

Relevant points

eg:-

fig. showing ~~Balan~~ Balanced selection

② Helps us to know about lethal & sublethal genes

(2.1) Hardy-weinberg law acts as a medium to study about lethal genes etc.

Remarks

③ Can study about mendelian inheritance:-

Mendelian population helps us to study various types & patterns of inheritance among the population

④ Can help synthetic theory of evolution:-

The combination of factors produces the evolution ongoing which can be used for further studies

Relevant parts

⑤ Complements the Eugenics:-

knowing about deleterious genes help in the field of eugenics for the attainment of social selection of genes.

⑥ Can help in medical studies:

Anthropology is developing in many fields. Fields like medical anthropology, molecular genetics may have large impetus from these.

Conclude with: Relevance of Hardy-Weinberg law for ~~Genetics~~ population Genetics

Thus, mendelian & Hardy Weinburg equilibrium contributes much to Anthropological development for the betterment of humans

7.5/15

Remarks

2. (c) Describe major skeletal similarities and differences between Home Erectus and Homo Sapiens. (250 Words) (20)

Homo erectus is the extinct species of genus Homo. Homo sapiens is the species which is modern man.

Geographical distribution

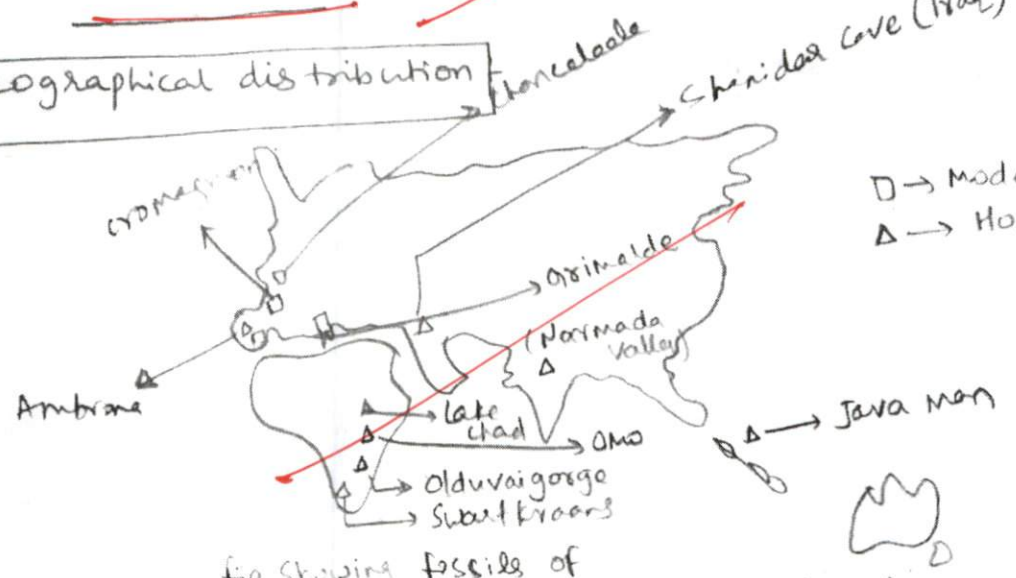


fig showing fossils of Homo erectus & modern man

— Homo erectus belongs to the lower paleolithic age (5,00,000 – 36,000 years ago).

— Modern man originated at about the 10,000 years ago in upper paleolithic period.

(*) There are many skeletal similarities & differences between Homo erectus & Homo sapiens

Also Describe homo sapiens and its distinct features

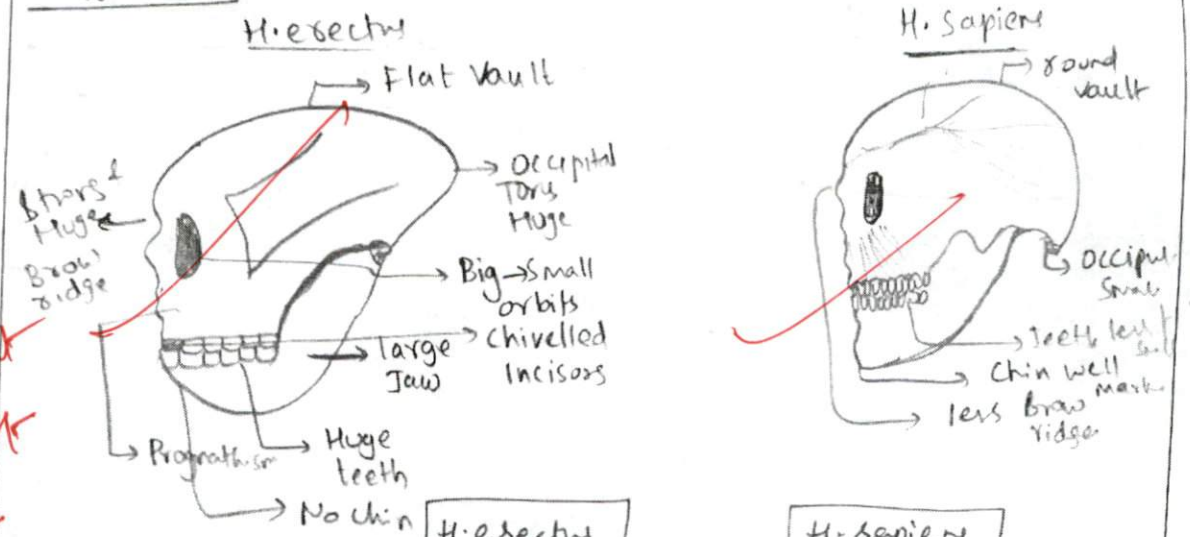
Also write other features — heavy eye sockets

Remarks

Good depict.

to present well form highlight similarities b/w homo erectus & homo sapiens then highlight differences.

Differences:-



	H. erectus	H. sapiens
Cranial capacity	675-~1300 cc	~1300-1500 cc
Cranial Vault	Flat	rounded
occiput	Huge & prominent	Less prominent
Orbit	Square & angular	rounded & big
Supra Orbital ridge	Huge	less prominent
Chin	No chin	chin present
Jaw	Huge	less huge
Teeth	are bigger	Smaller
molar	heavy	small.
Face	prognathism	Orthognathism

Remarks

Good represented through tabular format.

Similarities:

① Majority of post cranial features are similar.

② They are:-

① Bipedalism:- erect posture.

① Presence of linea aspera in femur

fig:- Femur.

② Spinal cord/ Vertebrae have 4 bents. Lumbar prominence is seen.

③ Limbs are well developed.

④ Some teeth are similar to humans.

⑤ No diastema is seen.

⑥ Hind limbs are bigger than fore limbs etc.

Culture:-

H. erectus: shows abbevillian culture.

eg:- Hand axes, cleavers etc

Hand axe

cleaver

Relevant points

Good

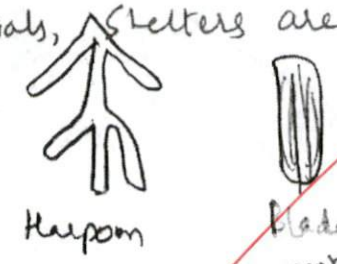
Remarks

- They are Hunter-gatherers.
- Probably living in groups & helpful for social behaviour.

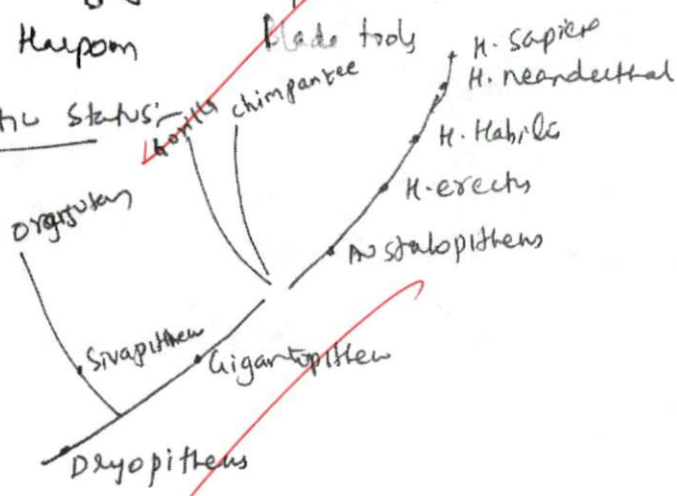
H. sapiens -

- Fossils meant to have Aurignacean culture (in Europe)
- Presence of burins, harpoons, bone tools etc.
- Burials, Shelters are seen.

Relevant over here



phylogenetic status:-



10/20

Based on various fossil studies; H.erectus is well established as the common ancestor of the modern homosapiens (even Swapin supported it).

Hence, H.erectus & H.sapiens have contributed much to the archeological anthropology.

Remarks

to address more comprehensively you can add

Extra Cranial differences
- Evolution
- Habitat
- Intelligence

3. (a) Give a critical account of the processes of organic evolution and explain how they contribute to speciation. (200 Words) (15)

Organic evolution is defined as the gradual change in the life forms from the lower to ~~bi~~ higher forms.

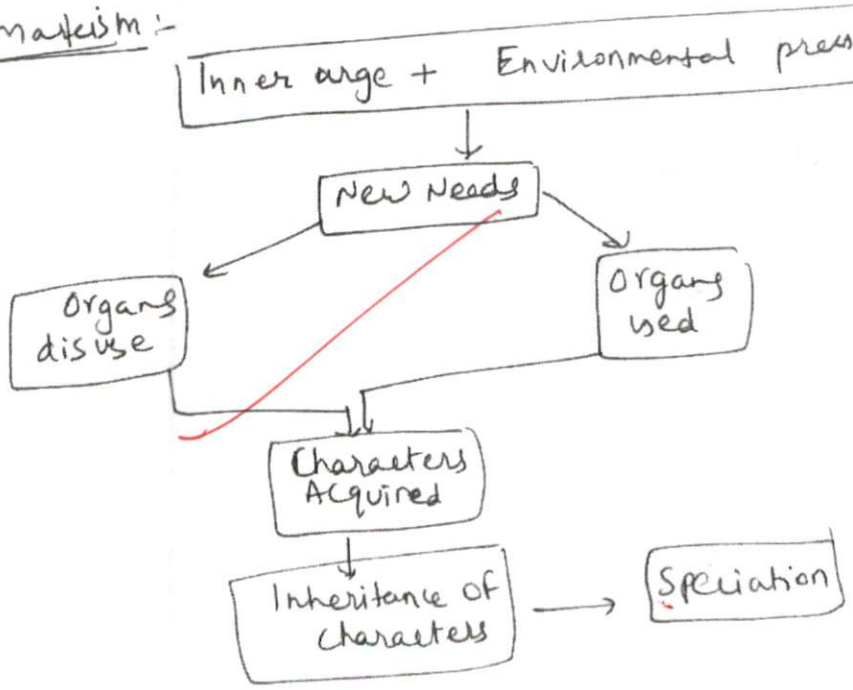
define properly and further explain evolution process.

According to Darwin, it is descent with modification.

Processes of organic evolution are the various theories devised to explain organic evolution. They are :- 1) Pre-darwinian
2) Darwinian
3) Post-Darwinian theories.

better first explain Darwin's theory of evolution then Lamarckism theory.

① Lamarkism :-



Remarks

Critic

Use fact core demand of question highlight examplied in support of Lamarckism - Evolution of giraffe

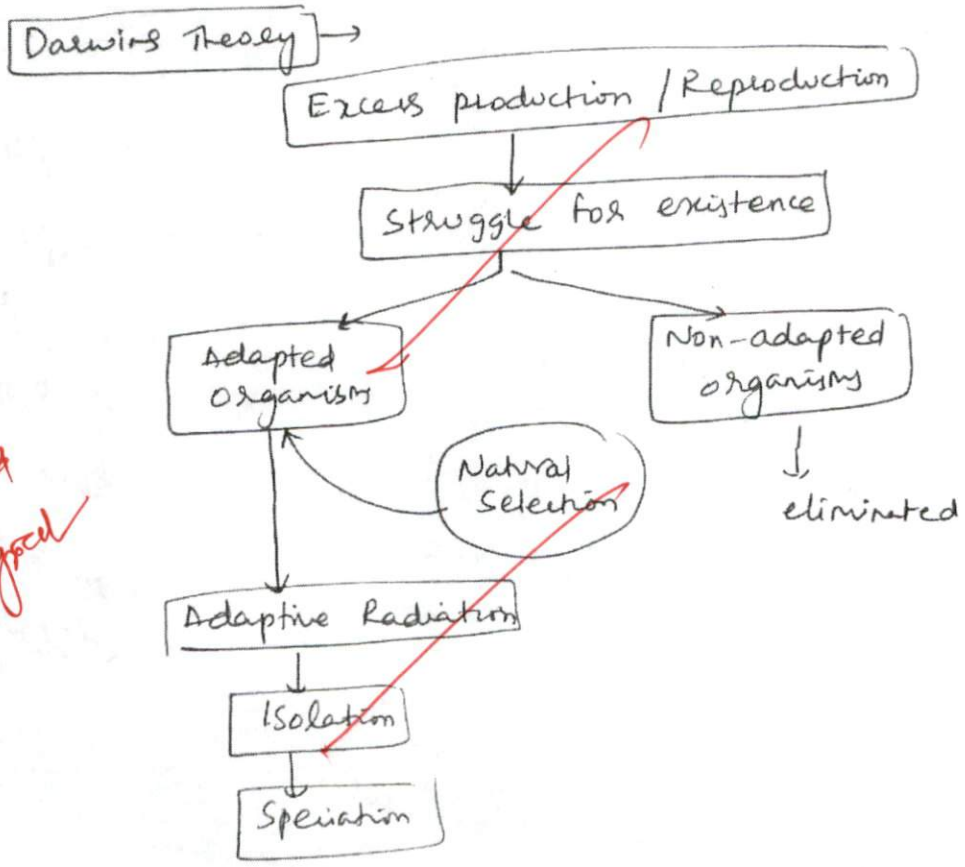
Critic:

① Lamarck was not able to discuss about the
① Not attainment of wings in man eventhough he has inner urge to fly.
② Theory of Use & disuse :- Existance of vestigial organs - not given

② "How the somatic changes occured could be transmitted" can't have evolutionary evidences.

③ But recent theories in epigenetics are favouring lamarckism.

Good diagram



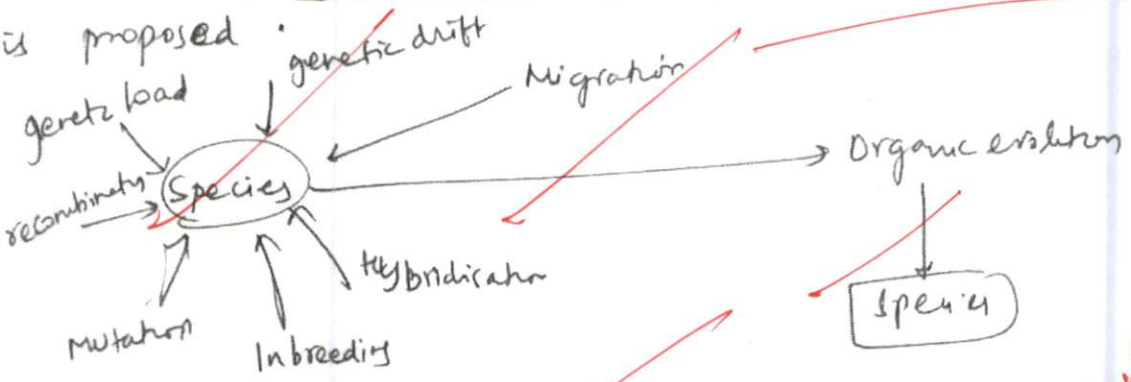
Remarks

Critic:

① Didnot take into account the role of Mutation

② Didnot explain → Survival of fittest etc.

Recently, Synthetic theory of organic evolution is proposed.



Also Explain briefly these factors.

Thus, these explain speciation in their own ways

Also include Consequent Speciation

Anthropological Significance:- This study helped in developing new concept in anthropology like eugenics, euthenics, euphenics, r-DNA technology & contributed for several evolutionary studies

- parapatric Speciation
- Sympatric Speciation

well Concluded

7/15

Remarks

3. (b) Discuss the relevance of DNA technology in prevention and cure of diseases. (200 Words) (15)

Start Introduction

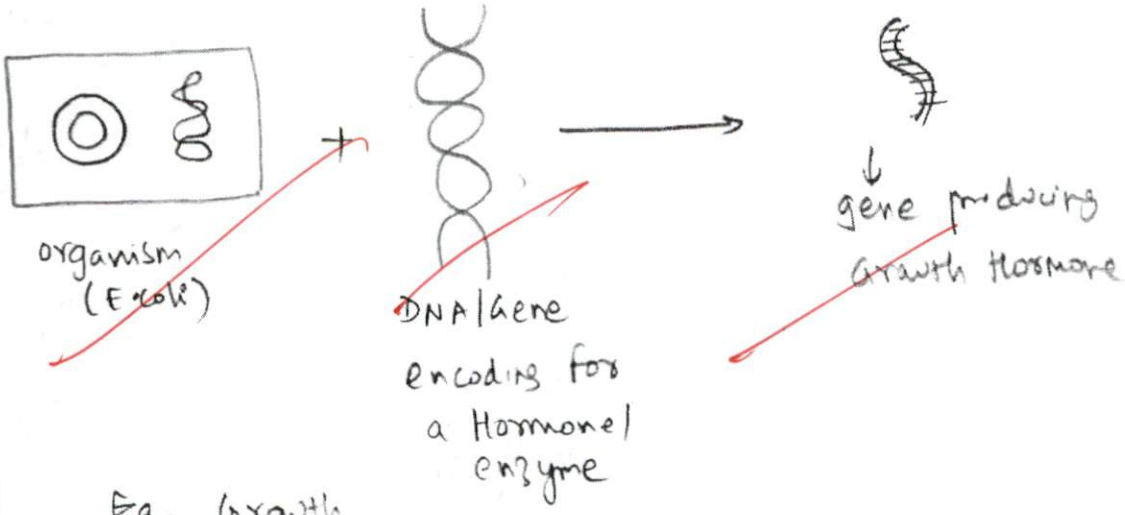
The scope of molecular anthropology have widened in recent times to accomodate many technologies.

DNA technology is defined as the molecular technology in which synthetic DNA is synthesised by altering, recombining of the existing DNAs of the organisms.

DNA Technology: In medicine

- The recent/new DNA technology is r-DNA (or) Recombinant DNA technology.

Good

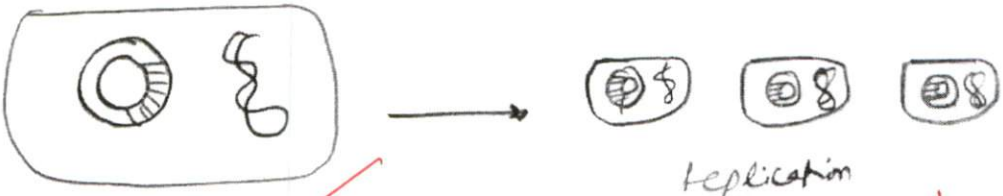


Also Explain this mechanism briefly

Eg. Growth Hormone

Ex. Correct

Remarks



Inserted into plasmid of E.coli

Replication
↓
produces more amount of the Growth Hormone.

Relevance in Medicine –

① Synthesis of Hormones/enzymes:–

This technology is helpful in synthesising the hormones/enzymes.

eg:– 1) Growth Hormone for dwarfism
2) Insulin for diabetes etc.

– So, helpful in curing these diseases

② Helpful in prevention:

① Eg:- Vaccines:

Recent Zydus Vaccine is a DNA-dependent Vaccine which is helpful in Covid-19 Vaccination

② Synthesis of Monoclonal antibodies:–

Eg:– Etolimab etc for Asthma etc

Also highlight Recent developments in DNA technology
- Monoclonal antibodies
- Edible vaccines

Remarks

3. (c)

③ Diagnostics:

- Helpful in diagnosing certain condition.

eg:- 1) Western blotting
2) Northern blotting for Nucleic acid amplification techniques.

Eg:- 1) Diagnosis of HIV
2) Diagnosis of Breast Cancer through FISH technique

Relevant to the Context of question

④ Role in disease prevention:- (by using drugs) :-

Some DNA based drugs are used prophylactically to prevent some genetic conditions.

Also Add few Disadvantages of DNA technology

may lose Genetic diversity

Anthropological significance:-

These studies will help for molecular anthropology & contribute to new genetic studies namely "Nature-Nurture" debate by Galton etc.

Thus, DNA technology has impeccable implications in the field of Medicine.

6.5/15

Remarks

3. (c) Compare the fossil remains of progressive and 'classic' Neanderthal men for anatomical characteristics and spatial distribution. Examine their phylogenetic position in human evolution. (250 Words) (20)

Neanderthal man is the extinct species of genus homo.

Introduce about Neanderthals time period. 40,000 yrs Ago.

Geographical distribution:

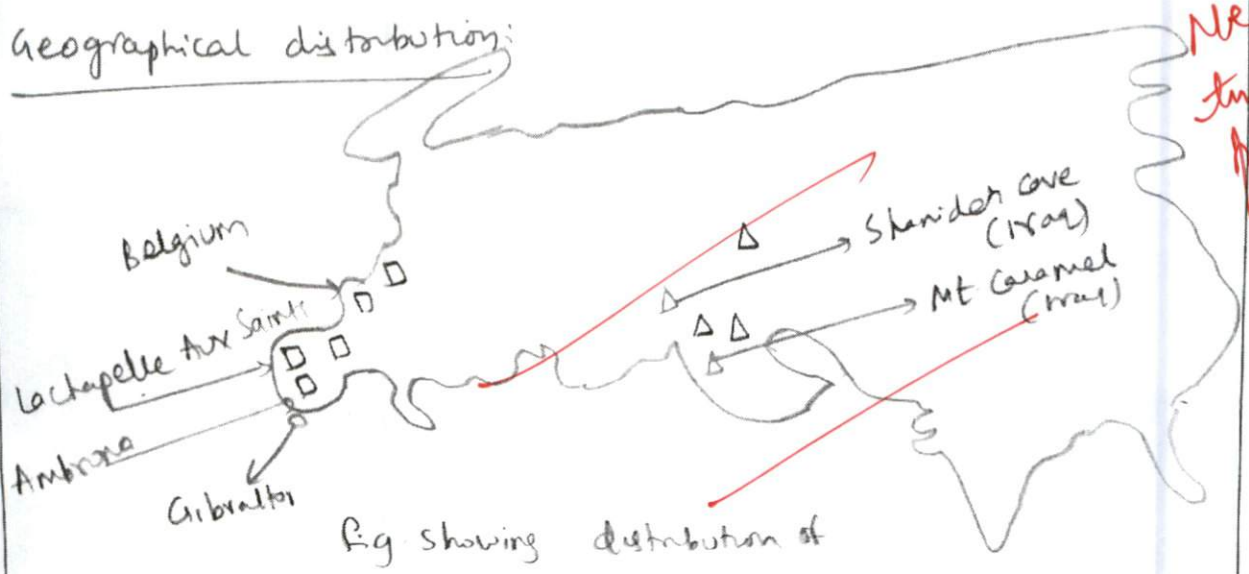


fig showing distribution of neanderthal man.

□ → classic type

△ → progressive type.

* Progressive type is found first in Mt. Caramel
* Classical type / La-chapelle Aux Saints is first found in France.

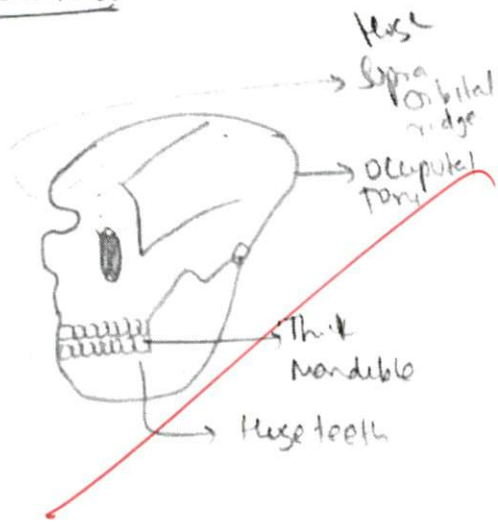
Relevant Ovel here

- There are various similarities & differences in the progressive & classic Neanderthals.

Can also highlight important sites of classical & progressive Neanderthal in tabular form

Remarks

Differences:-



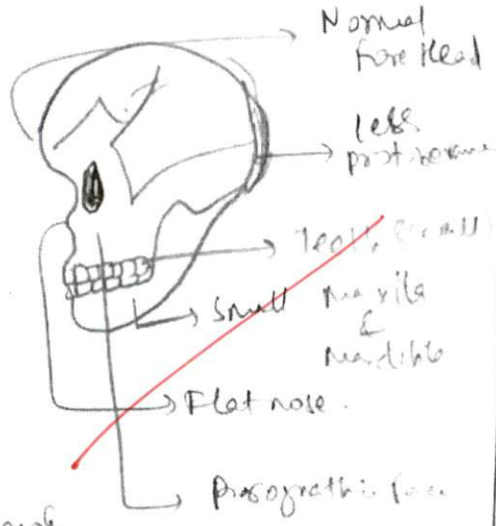


Fig. Showing Both types of neanderthal man

Characters	Classical type	Progressive type
Skull Cranial capacity -	1600 cc	1400 c.c
Cranial Vault -	Lower	Higher
Occipital torus -	protuberant	less protuberant
Nose -	Close to Homo erectus	Close to modern Homo sapiens
Orbits -	A bit angular	Circular.
Mandible -	Thick	Thin & less bulky
Teeth -	Parabolic dental arcade	Parabolic dental arcade

Also add
- slow forehead
- Supra orbital Ridge
- chin
- Body built

Remarks

Supraorbital ridge	more prominent	less prominent

Similarities:

① Both show similar post cranial features.

eg:-

① ~~Sam~~ Bipedal & presence of lineaaspera in femur.

② Long Hind limbs than fore limbs

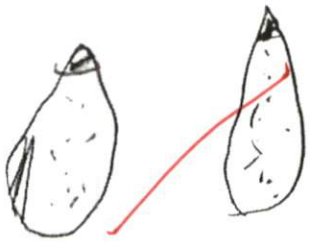
③ Lumbar curve is present

④ Hip bone is more human like.

CULTURE

⑤ Both show similar culture, Mousterian

Culture:



Burin Borers etc

Relevant in the context of question but address phylogenetic status comprehensively.

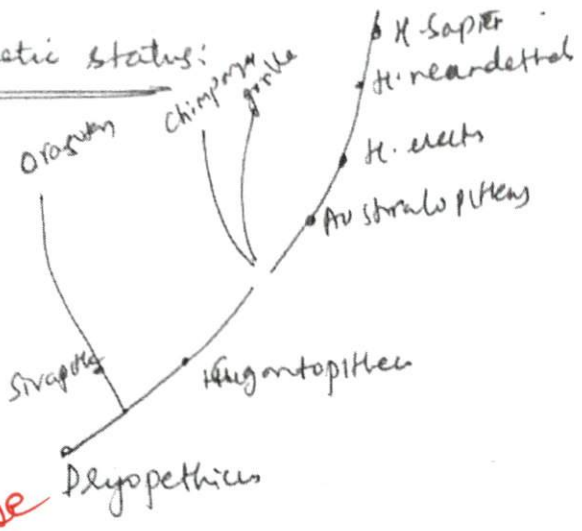
Remarks

4. (a) Consar

Also Explain briefly three hypothesis for phylogeny of Neanderthal man

- Neanderthal phase of man hypothesis
- The pre-Neanderthal hypothesis
- pre-sapiens hypothesis

phylogenetic status:



After studying Neanderthal genome project (2010), paleontologists came to conclusion that these are Human ancestors. Both Homo sapiens & the Neanderthals have same ancestors – H. erectus.

Many theories like Piltdown man etc have created confusion.

But, now, Neanderthals have been accepted as the archaic Homo sapiens.

9/20

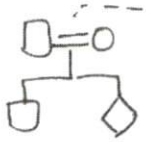
Remarks

4. (a) Consanguineous mating (150 Words) (10)

Consanguinity is the relationship by virtue of being a descendant from common ancestor.

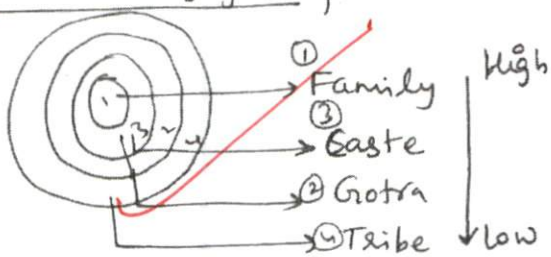
Mating between persons with Consanguinity is called as Consanguineous mating.

Introduction

Denoted by :- 

also mention various forms of Consanguineous marriage
- first cousin marriage
- second cousin marriage
- uncle - niece marriage.

Levels of consaguinity:



Consequences of Consaguineous mating:-

1. May lead to short time inbreeding depression
2. May express deleterious genes in the offsprings
3. Genetic defects are seen more in the Consaguinous mating.

also highlight prevalence in India
- NFHS-4 (2014) Data

also include its long term impacts
- Due to elimination of recessive alleles, population loses genetic diversity in the gene pool.

Remarks

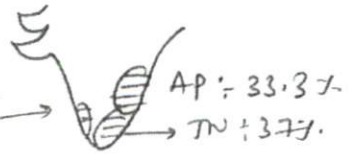
Long term effect:-

generation	Homozygote	Heterozygote	Homozygote
1st:	0	N	0
2nd	N/4	N/2	N/4
3rd gen:	3N/8	N/4	3N/8
F_α:	$\boxed{N/2}$	0	$\boxed{N/2}$

Relevant point

– As always thought Inbreeding is not very harmful in long run as it may eliminates Heterozygotes in the population.

Inbreeding in India: (Studies)



Mention in effect introduction part

① Majority inbreeding occurs in A.P, Tamil Nadu, Kerala & some parts of U.P etc.

② Afzal & Sinha studied the Ansari Muslims of Bhagalpur & identified certain genetic defects & IQ disturbances in them.

Write a solution oriented conclusion

Thus, consanguineous mating studies help for further studies in Inbreeding & evolution of man.

4.5/10

Remarks

4. (b) Klinefelter's Syndrome (150 Words) (10)

Chromosomal abberations are mainly structural & Numerical. Numerical aberrations occur when there is difference in number of chromosomes in the offspring. Klinefelter's Syndrome is one type.

Apt Introduction

Frequency:- 1 in 100 - 1 in 500 males get affected

Reason - Non-disjunction of chromosomes.

Case study - Ann Rita Jayaraman studied about the schizophrenia & its occurence in the klinefelter's syndrome patients.

Relevant over here

Genotype - 47 (XXY)

Clinical features -

1. Long stature
2. Lethargic face
3. Less developed Hair (Face + Scalp) public hair & facial hair
4. Less developed secondary sexual characters
5. Long lower limbs
6. Breasts developed (Gynaecomastia) in males

Also Add No sperm production

Feminine voice

Remarks

4. (c)

(7) associated Congenital malformations like Heart defects

(8) Less sized testes

(9) Scrotum is small when compared to the normal persons

(10) Less I.Q.

Good

Diagnosis –

(1) ~~Physical~~ clinical examination

(2) Amnio centesis in womb during pregnancy.

(3) Karyotyping 47, XXY

(4) FISH (Fluoresent Insitu Hybridization)

(5) USG Scan.

Also mention – Depressed thyroid function –

Treatment:

(1) Genetic Counselling

(2) Learning methods

(3) Adminstration of testosterone (Hormone therapy) etc

Testosterone Replacement Therapy – fertility treatment

Anthropological Significance –

Klienefelter syndrome & Others helps us to understand the deleterious genes, helpful for Eugenics in anthropology.

Remarks

5/10

4. (c) Dollo's law (150 Words) (10)

Macro evolution is the process that happens at very large taxa level. One of the processes & theories is Dollo's law.

Apt introduction

Proponent :- Doll (Belgian ~~ge~~ evolutionist) paleontologist

Law :- Evolution is irreversible & irreplaceable

Explanation:

① Evolution is a gradual process

② The change in structures of an organism is very gradual & the changes once occured can't be regressive & got back from the present form.

Also write Dollo's law of irreversibility

Eg :- ① Man developed bipedalism & erect posture gradually.

② Now, it's not possible to go back to quadrapedalism.

Remarks

GS SCORE

3. The reason it gives :-

Also mention

No possibility of reversion to primitive organization

Similar environment can not be reproduced with similar features of the organism.

Critic:

① It is not entirely true.

② Sometimes, during evolution certain factors come again even similar environments are not present.

Relevant over here

eg:- Extinct Flying Reptiles $\xrightarrow[\text{rise}]{\text{gave}}$ Flying birds $\rightarrow$ Flying Mammals (eg:- Bat)

Evolutionary Significance:-

Helps to determine the direction of evolution by studying various adaptation behaviours.

Well Concluded

Thus, the Dollo's rule is helpful in evolutionary studies.

4.5/10

Remarks

4. (d) Jane Goodall's contributions to primatology (150 Words) (10)

Jane Goodall is the student of Leakey. She is One of the finest anthropologists especially in primatology.

also include his study "Gombe stream National park.

place (Birth) :- England

Occupation :- primatologist, ethologist, Conservationist.

Contributions to primatology

① Literary contributions:

Books :- 1) "In the Shadow of man"
2) "The chimangeas of Gombe :- Behavioural adaptations"

Relevant in the Context of question

② She has contributed to primatology so much by studying for 45 years in Chimpanzees in Gombe, africa.

② Chimpanzee group has accepted her & so it has become so easy for her.

④ Social behaviour :-

④.1 She observed several heirarchies in Chimpanzees.

④.2 Family, kinship, primitive social behaviour is seen.

Remarks

you need to highlight measure findings of Chimpanzee study

(5) Tools:-
They use various termite sticks to catch many termites. This discovery made Leakey to tell that "We should redefine Man"

(6) Eating habits:-
- ~~As~~ Unlike many thought, they are Omnivorous animals.

- No Nuclear family unit

(7) Methodology
→ Naming chimpanzees by names
→ Using notes, observation in field.

they mention significance/ inferences of these findings

CRITIC-
- Many have criticised her for naming chimpanzees etc

Nevertheless, Jane Goodall has contributed immensely towards primatology.

- do know about
- factors & forces behind a shift to bipedalism
- Language, supporting the need hypothesis

4.5/10

Remarks

4. (e) Rhodesian Man (150 Words) (10)

Rhodesian man is the extinct species of genus homo.

Discovery:- By Woodsmith near Broken hill (Zambia).

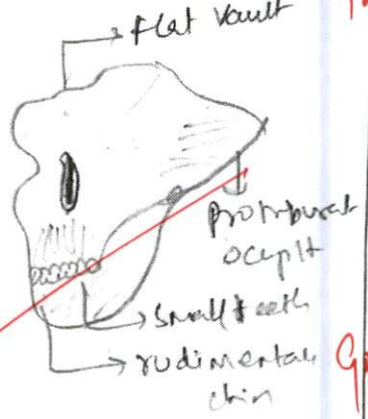
Also add: Time period and climate

Features:-

Cranial capacity:- 1280 cc - 1400 cc.

- 400,000 - 125,000 yrs ago.

Other features:



1. Cranial vault is flat.
2. Supra orbital torus & Occipital torus is protuberant.
3. Teeth has no diastema
4. Rudimentary chin is present
5. Teeth is similar to modern man.
6. Linea aspera in femur → Bipedalism & erect posture
7. Hip bone is widened when compared to neanderthal man.
8. Foot is arched like modern man
9. Spinal cord has lumbar curve

Good.

Also mention primitive feature model & separate headings

- Such as
- Heavy brow ridge
- Thick bones

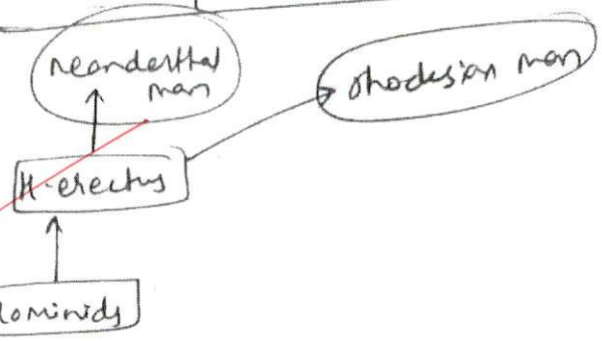
Remarks

Culture:

① Culture is not well known but the fossil belongs to "Middle paleolithic period"

Explain briefly.

phylogeny:



also mention other missing relevant cultural features

— Based on qualities of rhodesian man, it is speculated that it is a branch from H-erectus to neanderthal man.

Thus, studying Rhodesian man helps in evolutionary studies.

write a holistic conclusion

5/10

Remarks

5. (a) Define Genetic polymorphism. Discuss various types with suitable examples. (200 Words) (15)

According to Butenner Janusch; Occurance of more than 2 alleles at the same locus of chromosome >1% in the population; the condition is called as genetic polymorphism.

Be specific with definition

Thus, it is the condition in which there are many types of alleles / many form of genes.

first write about types of Genetic polymorphism

Causes
- → Mutations
- → Inbreeding
- → Hybridization etc.

- DNA Level
- Biochemical Level

then write Causes with relevant examples

Types

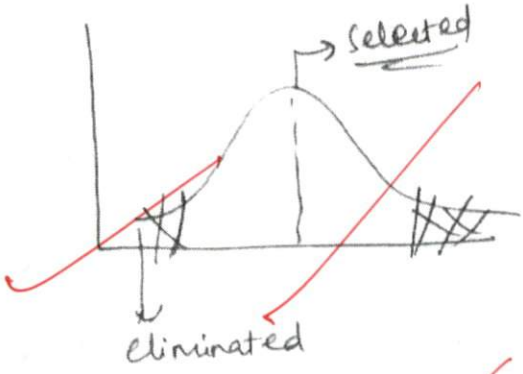
① Monogenetic inheritence | Stable polymorphism (or) Normalizing :-

1. In this polymorphism, the intermediate forms | average forms are ~~selecte~~ ~~Set~~ ~~eliminated~~ & ~~extr~~ selected (extremes are eliminated

define properly

- ABO Red cell antigens

Remarks



Good

Eg: 1) Usually, Intersex is eliminated

2) Babies born with Huge & least weight are eliminated.

② Balanced polymorphism :- / Disruptive Selection:

Explain further for more clarity & understanding

→ Here, the Heterozygotes are selected over Homozygotes

eg: 1) Sickle cell trait: (Allison, 1954)

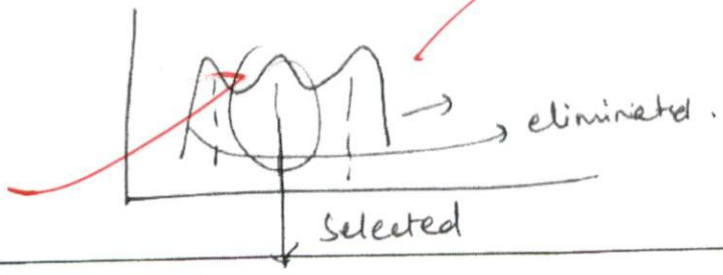
Homozygous trait (recessive) → Anemia → death

Also Add example

Homozygous dominant trait → death

Heterozygotes → Resistant to falciparum Malaria

* It's observed in African Countries.



Remarks

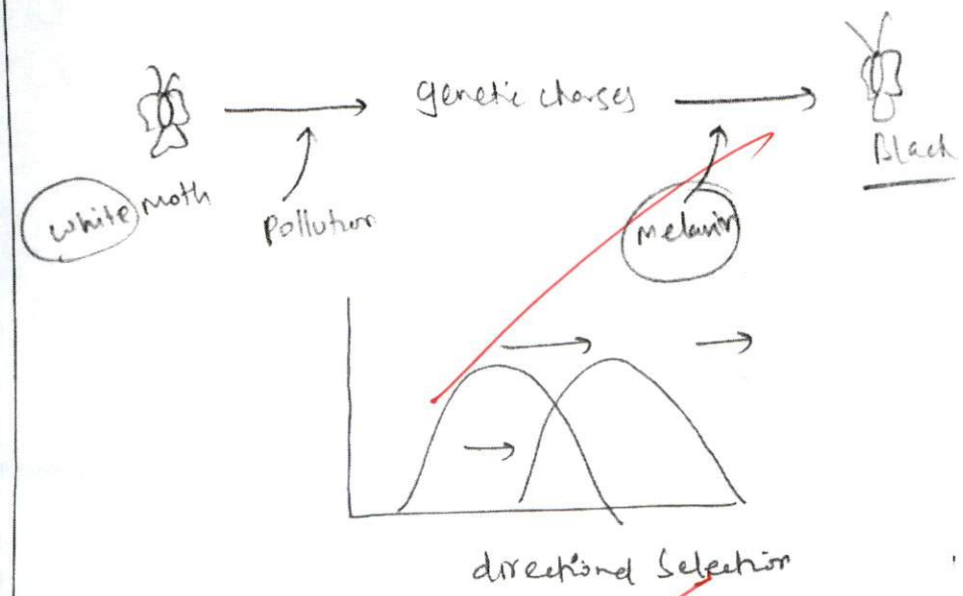
(3) Transient polymorphism:

→ Here, when one allele is dominating other allele over ~~by~~ time, it gradually replaces other.

Explain it properly

eg: Kettlebell demonstrated this in beston betularia worm/ insect.

— this polymorphism located in a particular gene locus.



Evolutionary Significance: Helps in genetic studies which may play huge role in genetic anthropology

Conclude with its applications in various fields.

6.5/15

Remarks

5. (b) Discuss numerical and structural chromosomal aberrations in man illustrating with examples. (200 Words) (15)

Explain briefly phenomenon of chromosomal aberrations

Aberrations which occur in chromosomes are called as chromosomal aberrations.

Chromosomal aberrations

- Numerical
  - Aneuploidy
    - Haplo ploidy
    - Hypoploidy
  - Euploidy
    - Mono ploidy
    - Polyploidy.
- Structural
  - Mutation
  - Translocation
  - Deletion
  - Duplication
  - Inversion

Give:

Numerical chromosomal aberrations:

also briefly explain
- Aneuploidy
- polyploidy
- hypoploidy

① When in the set of chromosomes; any one (or) two (or) more number of chromosomes are extra / less, they are called as Numerical chromosomal aberrations.

eg:- ① Down's syndrome – Trisomy 21

② Edwards syndrome – Trisomy 18

② Patau's syndrome – Trisomy 13

Remarks

(4) Klinefelter's Syndrome → 47(XXY) (47, XXY)

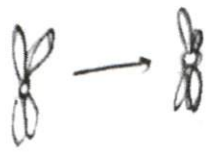
(5) Turner's syndrome → 45(XO) (45) etc.

* When entire set of genome is affected, it is called Euploidy.

Structural abeltations:

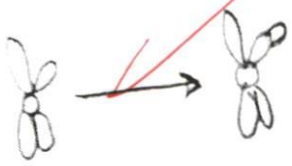
① Deletion: When a segment of chromosome is deleted, it is called as deletion.

eg- 1) Cri-du-that syndrome



② Duplication:

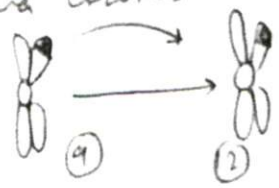
When a segment of chromosomes copies twice; it is called as duplication



Eg:- Pallister-killian syndrome
- chr-(12) is duplicated

③ Translocation: When a segment of chromosome is translocated on to same | Homologous | Non-Homologous chromosome, it is called as translocation

Eg- 1) Philadelphia chromosome t(9,22) chromosomes



Relevant in the context of question

Remarks

(h) Mutation:

- The replacement of a segment by other segment is called as Mutation.

Can be point mutation, Missense & Nonsense mutation.

eg:- (1) Replacement of Valine in the place of Glutamic acid at β-6 position of the Hb causes Thalassemia.

Anthropological significance:-

The study of these aberration is helpful in the Eugenics, genetic counselling & thus preserving the positive genes.

Also write Causes of chromosomal aberrations and Prognosis - Clinical examination then Treatment - Genetic Counselling - CBT

Conclude appropriately

6/15

Remarks

5. (c) Discuss role of genetic drift, mutation and migration as the causes of variation. Provide suitable examples in each case. (250 Words) (20)

Variation is defined as the difference in the genetic makeup of the generation when compared to initial generation.

Good introduction

Post Darwinian theories helped us to learn the impact of various agents that causes variation.

They are :-
- Inbreeding
- Genetic mutation
- Genetic drift
- Migration
- Hybridization etc.

Role of Genetic drift in variation

① Genetic drift is defined as the change in genetic frequency due to chance & not by natural selection

Relevant in the context of question

② Here, population must be small.

③ Its role can be discussed in the effects it gives to the given gene frequency.

Also write — In reproductively isolated populations chance factors produce rapid changes in gene frequencies totally independent of mutation, natural selection

Remarks

(3.1) Bottle neck effect:- When natural calamity wash out ~~Ente~~ the good genes, many deletrious genes occur by dominance.

Also Add Example, Toba Catastrophe theory

Good

$$\begin{matrix} Aa \\ Aaaa \end{matrix} \xrightarrow{\text{Disaster}} \begin{matrix} aa \\ aa \end{matrix}$$

— It Causes Variation.

(3.2) Founder effect:- Due to migration; Inbreeding Coupled with it have small population & thus change in gene frequency.

Relevant Ques here

eg:- Amish population in Pennsylvania (USA).

(3.3) Thus, it has huge effect in the Variation.

Role of mutation in variation:

eg:- Mutation of genes help in genetic variation

① Philadelphia chromosome:- Aberration caused by mutation can cause to this condition.

Chromosome (9, 22) translocation.

Valid point

— This produces deleterious effects such as CML, AML etc.

② Point mutation in the Thalassemia:-

Replacing Valine in the place of Glutamic acid at β-6 chain of Hb.

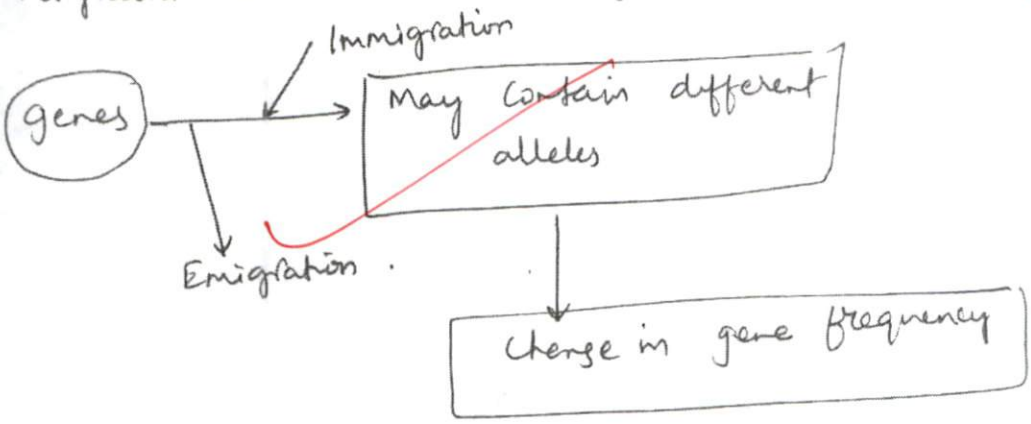
Remarks

- This causes variation by selecting the favourable genes
- But, in africa; Heterozygotes are selected as they are resistant to falciparum malaria along with sickcell trait in Hb.

Role of migration in variation →

Relevant in the context of question

- Migration consists of Immigration, Emigration.



eg: Amish population migrated from germany to Pennsylvania had inbreeding depression & produces deleterious effects.

Thus, these help in further evolutionary studies...

9/20

You need to Explain founders effect & Bottleneck effect as well.

Remarks

Conclusion can be improved

195/250

Remarks