

(SECTION : B)

QUESTION: 1

FUNCTION OF ANTIDIURETIC HORMONE:

Antidiuretic hormone is released from posterior lobe of pituitary gland.

Target:

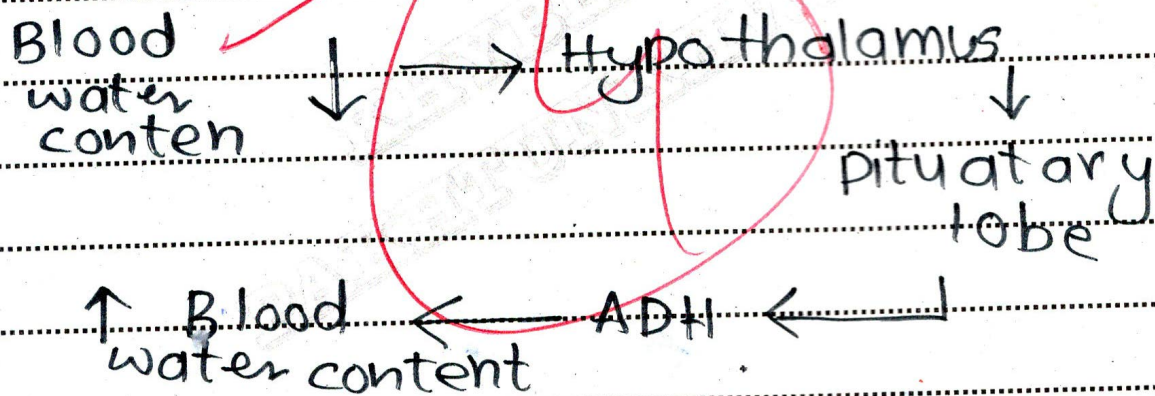
Its target is collecting tubules in kidney.

FUNCTION:

When body is deficient in water Hypothalamus detect this change and



directors posterior pituitary
to release ADH. ADH acts
on collecting tubules of
kidney and make them
permeable to water. As a
result blood water content
rises. hypothalamus detect this
change and stops ADH
production from posterior pituitary



Oxytocin:

Oxytocin is released from
posterior lobe of pituitary gland
and cause uterine contraction
and milk ejection from breast.



FUNCTION:

- It works on uterus thus stimulating uterine contraction and completes delivery of infant.
- Also in lactating females oxytocin causes let down of milk from mammary glands.
- After delivery the oxytocin release during lactation also brings uterus to its prepregnant size.



QUESTION: 2

In vitro fertilization:

In vitro fertilization is most beneficial technology used.



In vitro means "outside". As in this process sperm and egg fuses outside the body of female.

Importance :

This procedure is used if female's fallopian tube is closed.

or when man's sperm count is very low.

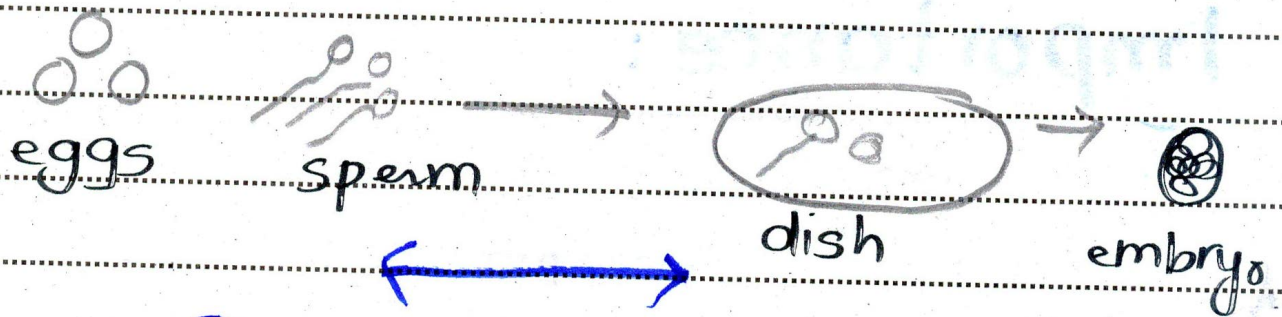
Procedure :

Female is treated with certain chemicals which stimulates several ovulation.

Female eggs are then obtained in a dish. Male sperm is also obtained.



Then in dish sperm and egg is fused. Within some days embryo is developed. Healthy embryos are then implanted in females womb.



QUESTION: 3

Mendel choose pea plant (*Pisum sativum*) for his hybridization experiment because of following reasons.

Pea plant was easy to grow.

It has short life span.

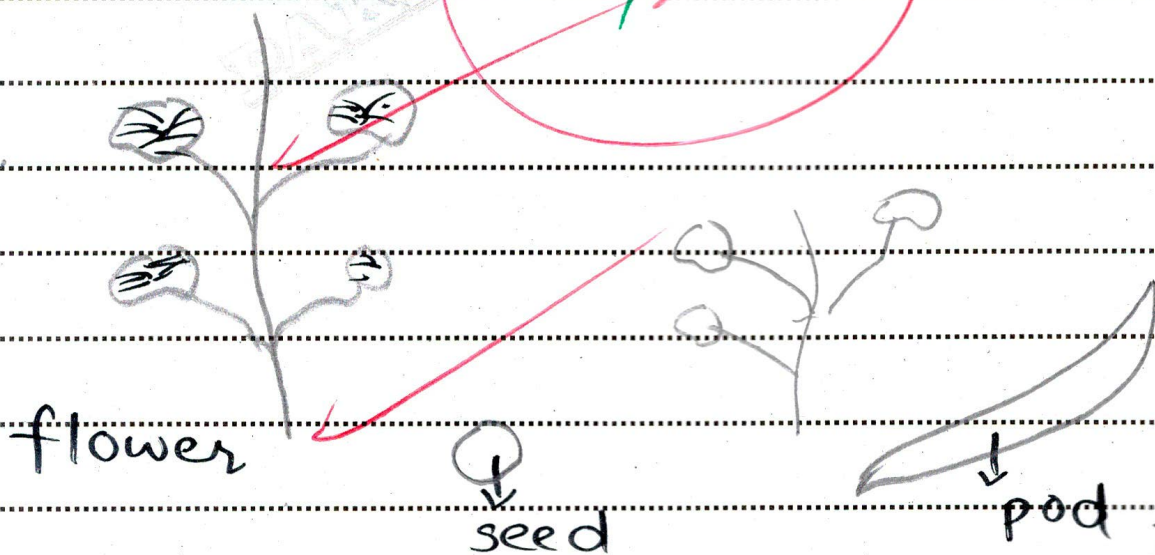
It can easily be grown



in open ground.
Self pollination occurs
in pea plant

Cross pollination was also possible.

It shows seven distinct contrasting traits like
tall verses dwarf
purple flower verses white flower.





QUESTION: 4

Semiconservative Model:

Semi conservative model was proposed by ~~Watson~~ and Crick who also determined structure of ~~DNA~~.

Explanation:

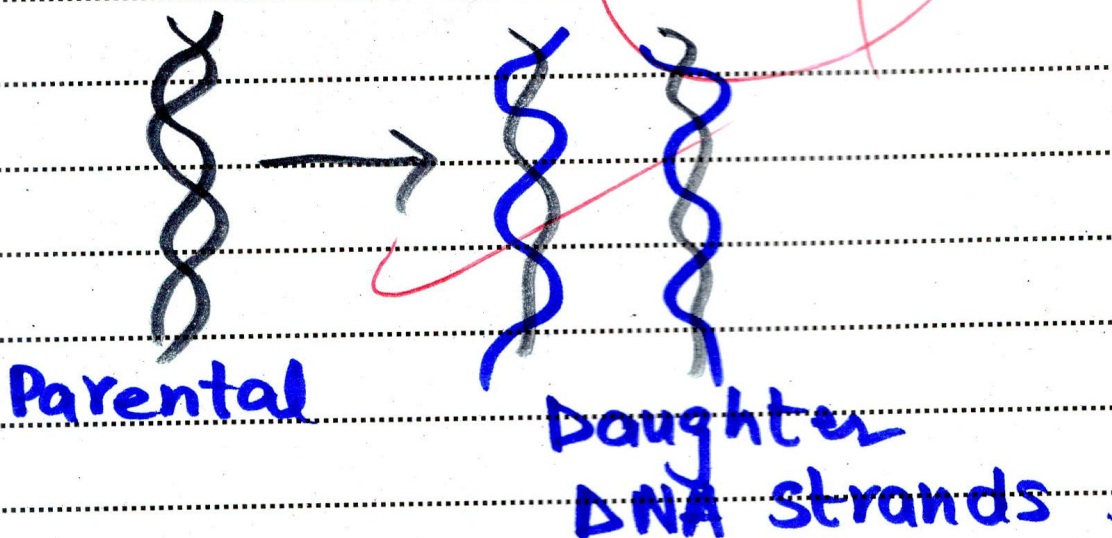
This model suggest during DNA replication the existing DNA strand (parental stand) unwind and uncoil. Also base pair bonding breaks and both strands become separated from each other. Each strand then act as template for the new strand. (daughter strand)



In this why DNA formed is hybrid DNA consisting of one parental strand and one daughter strand.

HYBRID DNA:

So parental DNA is partially conserved in new generation. However later experiment were conducted which proves that DNA replication takes through semi conservative model.





QUESTION: 6

Endosymbiosis

Endosymbiosis theory predicts that who modern day eukaryotes developed from prokaryotes.

Mitochondria :

The modern day mitochondria was originally a small prokaryote capable of carrying out cellular oxidation by using oxygen to produce useful energy.

Invasion

This organisms become part of another large cell either being a parasite or undigestible food source.



Chloroplast:

Modern day chloroplast were originally cyano bacteria capable of carrying out photosynthesis.

Invasion :

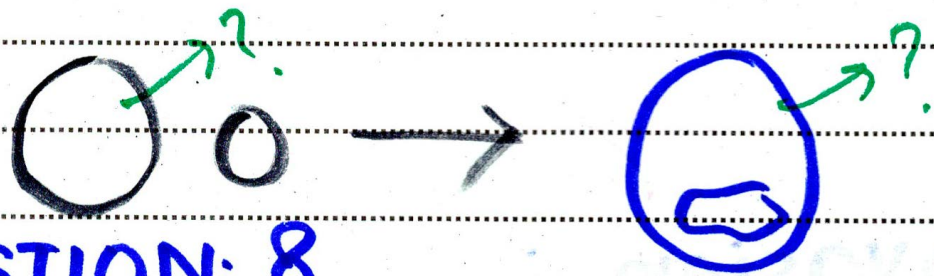
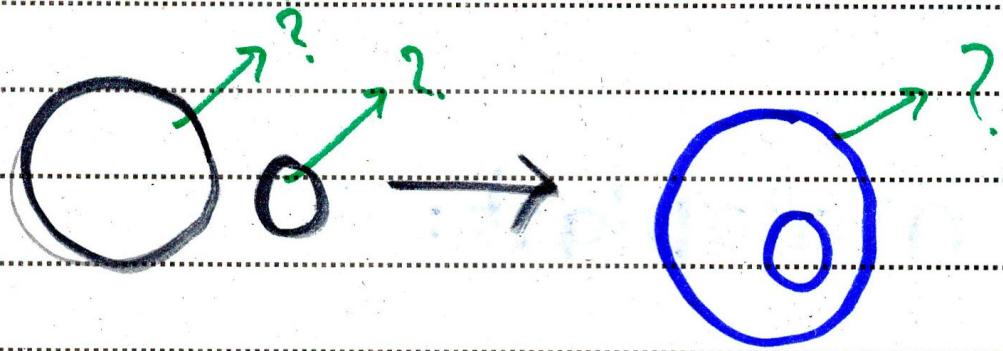
That cyano bacteria become part of big cell being as chloroplast.

Prove Of Endosymbiosis :

Research showed both chloroplast and mitro chondrial have their own DNA, genes, capable of division independently cell host cycle. And show characters more similar to prokaryotes than eukaryotes.

Dig - ?





QUESTION: 8 BIOTECHNOLOGY

Biotechnology is defined as
"use of living substances
and organic material
for welfare and advantage
of humanity"

Importance:

Biotechnology is fast growing
field of science that
has advanced human life.



By means of biotechnology genes can be synthesized artificially to produce desired product.

Conversion of milk to produce yogurt by means of fermentation in presence of yeast or bacteria.

In vitro fertilization is most important achievement of biotechnology.

It has increased growth and rapid production of various substances like plant clones, antibiotic production etc.

Alcohol can be produced by fermentation of sugar.





QUESTION: 9

Ribs :

Ribs are part of axial skeleton that form protective casing of heart and lungs.

Ribs Distribution:

Out of twelve pair of ribs 10 are called attached ribs. Out of these then 1 are true ribs while 3 are false ribs. The remaining 2 pair are floating ribs.

True Ribs

True ribs are those which attach directly to sternum. They are 7 in pairs.

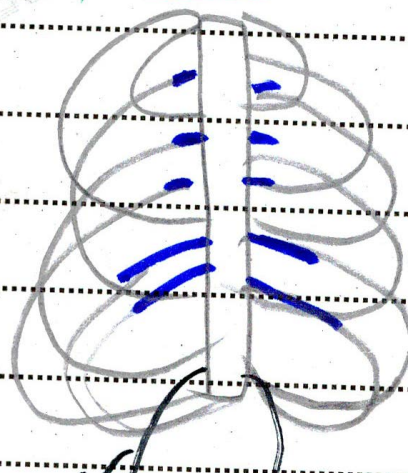


False Ribs:

Those ribs which attach indirectly to sternum through costal arch are called false ribs. They are 3 pairs in number.

Floating Ribs. (4)

Those ribs which are not attached to sternum are called floating ribs. 11th and 12th ribs are floating ribs.



floating ribs





QUESTION: 11

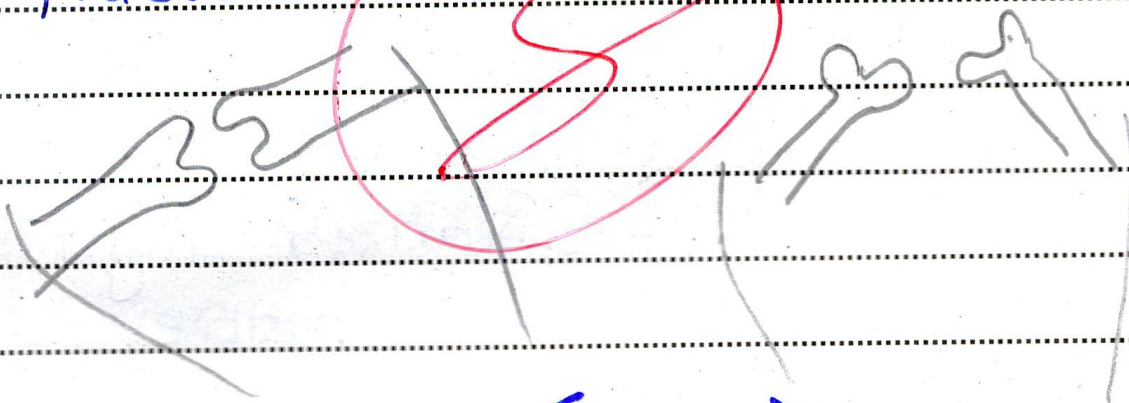
Difference Between Simple Fracture Compound Fracture.

- In simple fracture skin remains intact. In compound fracture the bone ends penetrate the skin.
- In simple fracture bones are coaxed on its position simply by physician's hand. In compound fracture bones are coaxed with surgical pins.
- Bone heals comparative rapidly. It relatively takes time to recover.



When exerting
force is low
then simple
fracture occurs.

When exerting
force is large then
compound fracture
occurs.



QUESTION: 12

RESTING POTENTIAL

When membrane
is at rest and
no impulse it
is conducting this
potential is called
resting membrane
potential.

ACTIVE MEMBRANE P

When membrane
is conducting
impulse it is
called active
membrane potential.



Its about
-70mV.

Its value change
and at spike potential
its value is 50mV

In resting membrane potential the neuron membrane is polarized. means negative inside and positive outside.

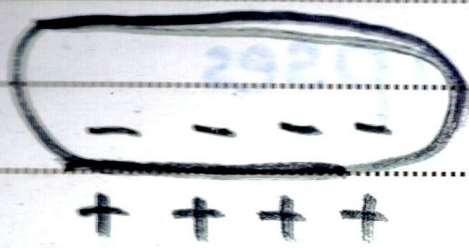
In active membrane potential neuron membrane is depolarized. negative outside positive inside.

It occurs in the absence of threshold stimulus.

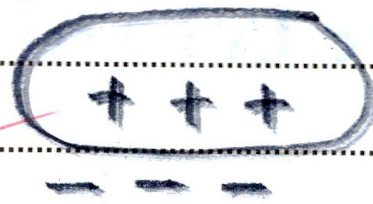
It occurs in the presence of threshold stimulus.

Na^+ and K^+ voltage regulated channels closed in resting potential

Na and K^+ voltage regulated channels open in active membrane potential.



Resting
membrane



Active
Membrane



QUESTION: 13

SYNAPSES

When neuron transmit impulse to another neuron the axon terminal of neuron and dendrite of next neuron have cytoplasmic connection rather a microscopic gap is present in between them this is called synaptic cleft and the process is synapses.

poor expression?



Electrical Synapses

- Electrical synapses is responsible for rapid impulse conduction.
- Here the gap between neurons is 0.2nm .
- Arriving nerve impulse at pre synaptic membrane sufficiently polarizes post synaptic membrane.
- It occurs only in some parts of body.

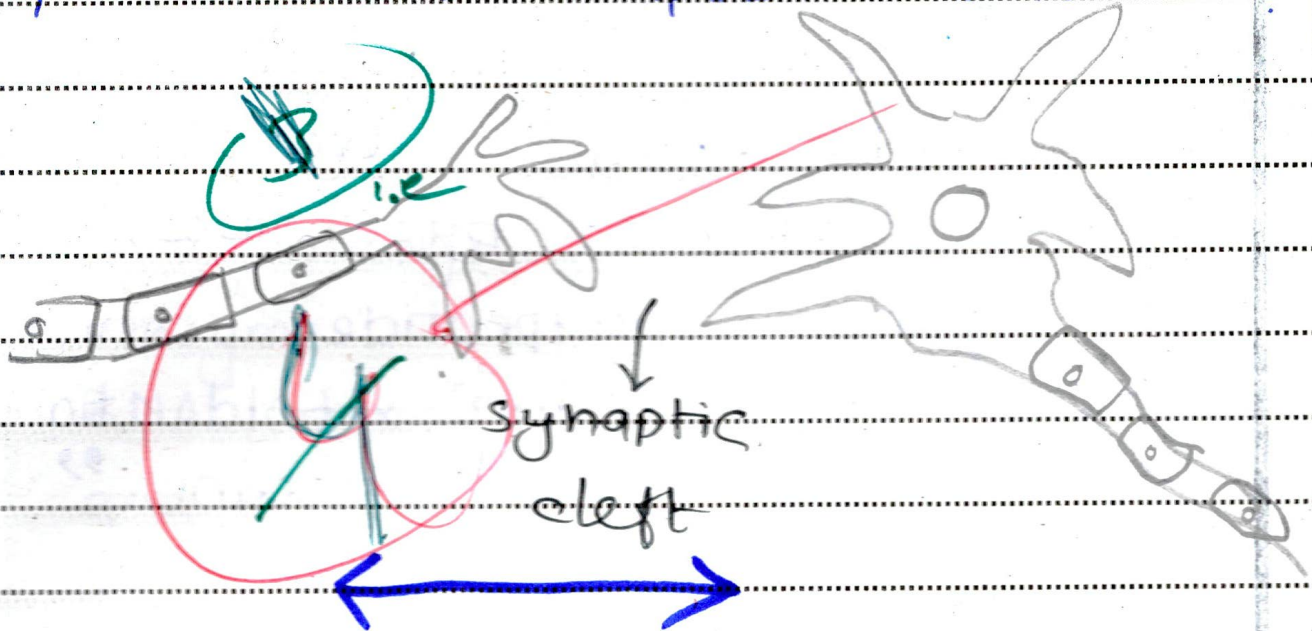
Chemical Synapses

Definition - ??

- Chemical synapses occurs over a synaptic cleft of 20nm or more.
- This type of synapsis is found in most of body.
- Chemical synapses uses neurotransmitters (chemical messengers).



for nerve impulse conduction



SECTION: C

QUESTION: 3

TRANSLATION:

Translation is second step
in protein synthesis.



Defination :

In translation the mRNA formed from transcription is decoded by ribosome to form polypeptide which then fold and refold to form an active protein.

Activation Phase :

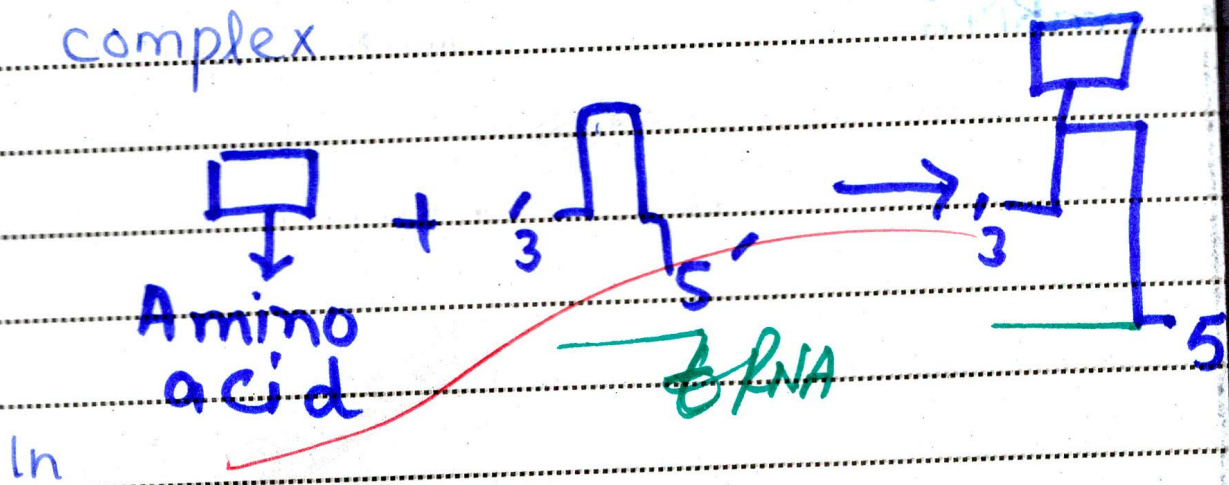
This process is initiated by activation of free amino acids dispersed in cytoplasm by specific tRNA.

During whole process of translation all amino acids that will take part in polypeptide chain are constantly activated by their anticodon carrying tRNA.



Aminocyltransfer RNA complex:

Amino acids join with tRNA by means of an enzyme called transfer RNA synthetase (an activation enzyme). As a result a complex is formed called aminocyltransfer RNA complex.



Initiation Phase:

Initiation phase is characterized by formation of initiation complex.



In this process subunits of ribosomes aminoacyl transfer RNA complex and mRNA bind together.

- First aminoacyl tRNA complex attaches with ribosomal subunit by means of an initiation factor.
- mRNA also binds with smaller subunit of ribosome by another initiation factor.
- Initiation complex is formed when small and larger subunits of ribosome also binds with each other by utilizing GTP molecule.

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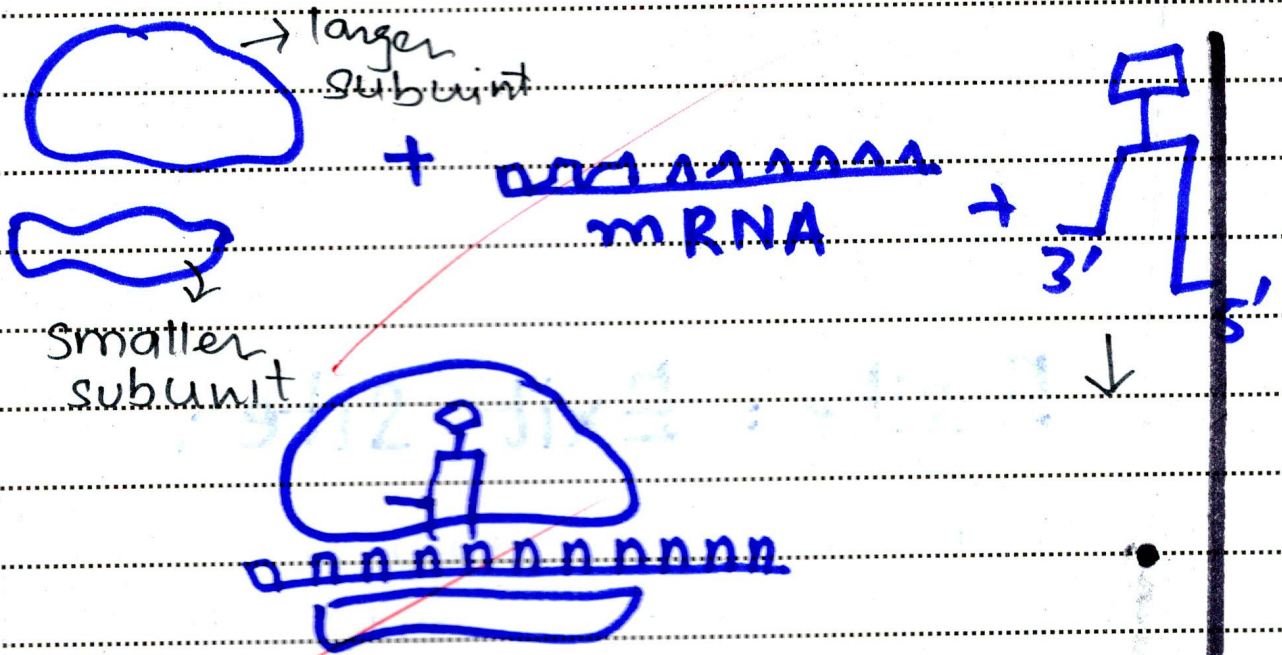
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(صرف بورڈ کے استعمال کیلئے) امیدوار یہاں کچھ نہ لکھیں



The site where first mRNA codon binds with its anticodon bearing tRNA is called A site. Here various amino acid carrying tRNA are exposed continuously.

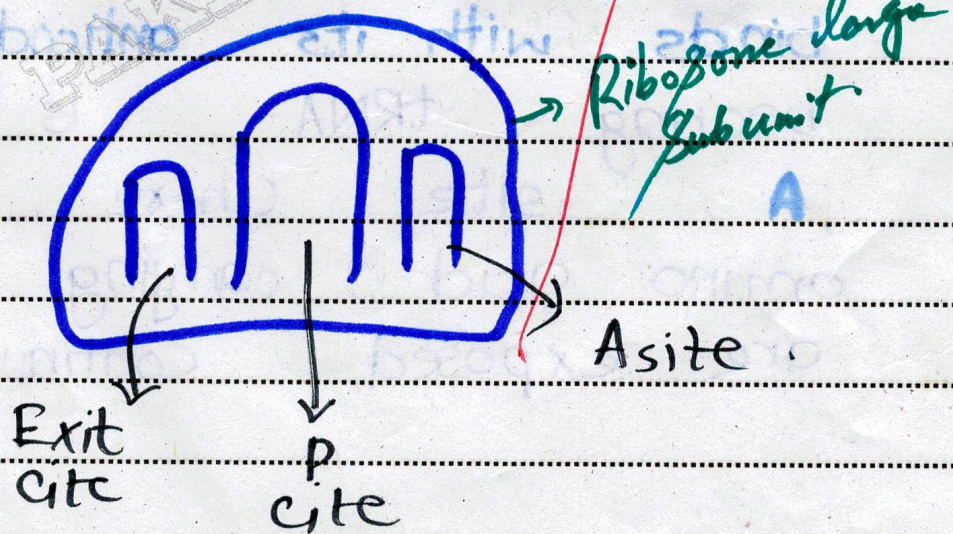


P site: Peptidal site:

There is another site called P site (peptidal site) where peptide bond will be formed between amino acids.

E site: Exit Site:

The E site is another where empty tRNA will leave the initiation complex.





~ ELONGATION PHASE:

During elongation phase, various amino acids bearing tRNA are exposed at A site P site.

The amino acid exposed at A site will have another tRNA.

The first tRNA is modified form of methionine (N-formyl methionine) which binds with anticodon on mRNA.

Aug

By the release of peptidyl enzyme from P site the amino acid is removed from P site and is attached to new amino acid at A site.

The translocation results in exposure of another amino acid at A site.

These steps repeats continuously during elongation. Polypeptide chain continue to form according to mRNA codes.

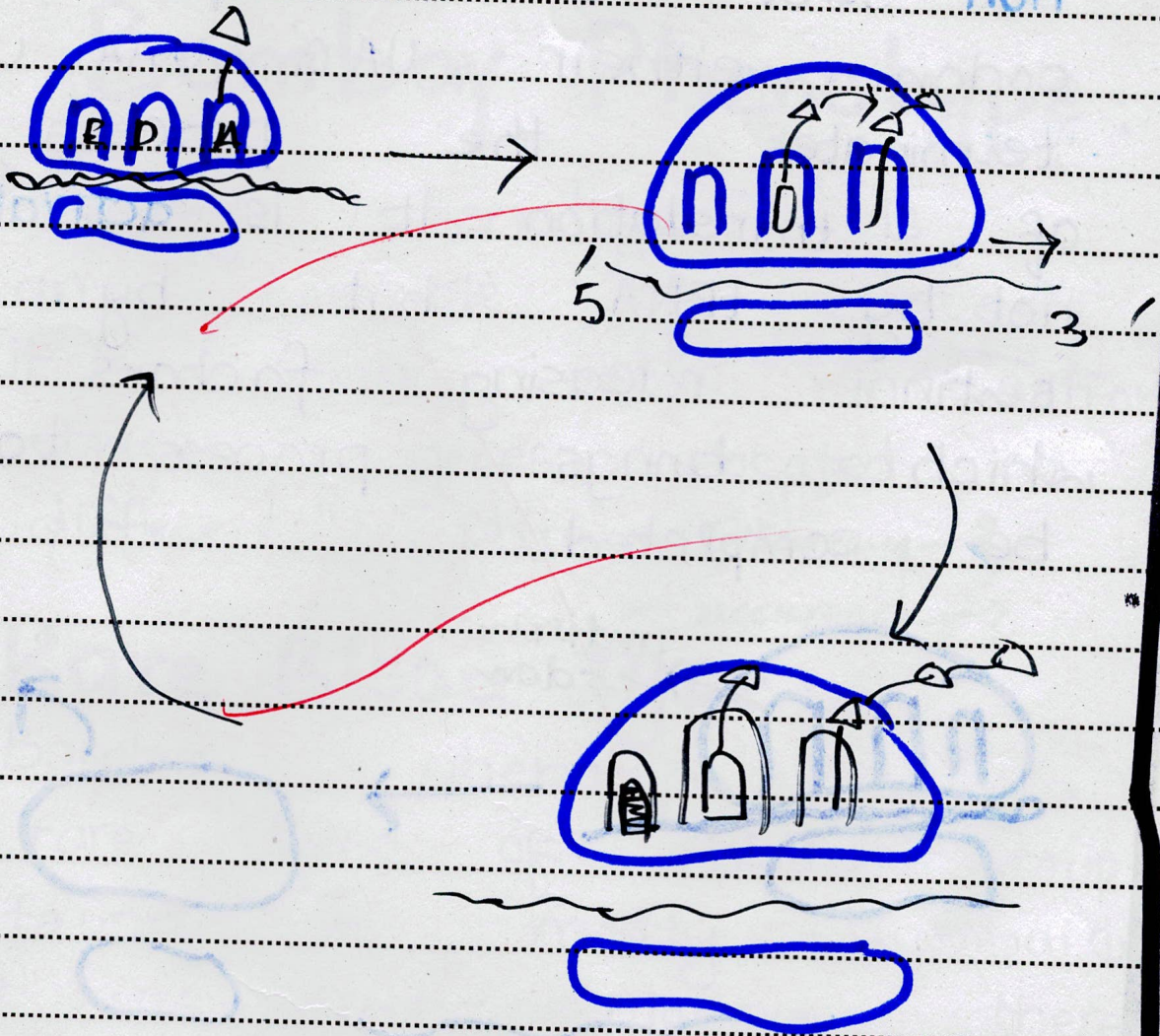
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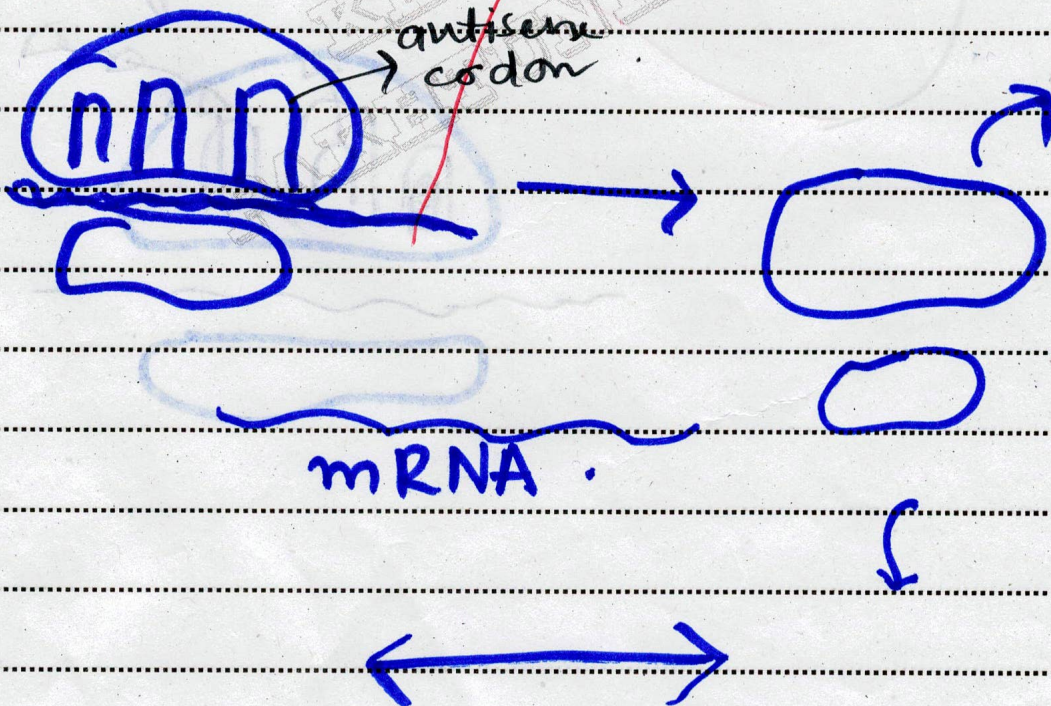
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(صرف پورڈ کے استعمال کیلئے) امیدوار یہاں کچھ نہ لکھیں





Termination phase is characterized by exposure of non sense codon (stop codon either UAG, UAA, UGA) terminates the process of translation. It is activated not by tRNA but by protein releasing factors which brings process to be completed.





QUESTION: 4

Part : a

Bombay Phenotype:

Bombay phenotype is an example of epistasis. It is a non allelic interaction between genes located at different places. → Discovery - ?
→ Occurrence - ?

Rare Blood Type:

Bombay phenotype is a rare type of blood group found in mostly Bumbai (India). It was first discovered there and is therefore named as Bombay phenotype.



Epistasis type:

It is a rare blood group type in which people are phenotypically O but genotypically may be (A, B, AB)

Importance Of H-Substance

Actually for correct expression of gene to form antigen, it also requires an substance called "H-substance"

Correct Expression:

H-substance is necessary for correct blood group expression. It has two alleles (h, H). Allele H is completely dominant over h or person

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(صرف پورڈ کے استعمال کیلئے) امیدوار یہاں کچھ نہ لکھیں

have genoty: (HH or Hh)
will produce H-substance

Chromosome No: 19:

Its gene is present on
chromosome number (19)
however it infacts activity
of blood group antigen
on chromosome number
(9).

Example:

Let for B antigen expression,
a person must have
genotype either (HH or Hh)
that produces H substance



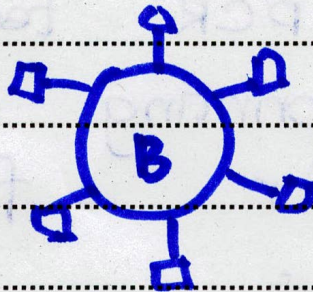
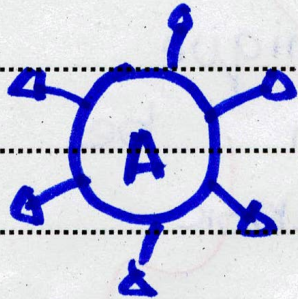
which modifies the B-gene
to become B-antigen.
The same is case for
A antigen expression.

Lacking This Antigen:

Those lacking this antigen
cannot produce H-substance
as a result no antigen
express themselves on RBCs.

Phenotypically:

As a result these people
are phenotypically O. Regardless
of gene of antigen
(A, B, AB) resides on
chromosome number 9.



if HH.

(Part A) (B) $\longleftrightarrow$ H(hh)

Polymerase chain reaction
is one of the most
important technique used
in biotechnology.

Importance of PCR:

PCR is widely used all
around the world for
DNA fingerprinting.

Through PCR technique
finger printing can be
used for forensic
purposes -

Through PCR small sized genes can be cloned easily which can be used to produce desired products like insulin etc.

It is easy to operate and working time is short. Its procedure is easy.

Genome Analysis

It is used in genome analysis to find the criminals.

Gene Formation:

It is used for differ gene or protein formation.

Thus PCR is an important technology used in biotechnology.





QUESTION: 5

AXIAL SKELETON:

Parts Of Axial Skeleton .

Axial skeleton forms the basic framework of body . However, appendicular skeleton is its extremities .

Parts Of Axial Skeleton :

Head (Skull and face)

Neck

Vertebral column

Ribs .

Sternum .

Ear ossicles .



HEAD: Head further consists of following parts.

→ Total No. of Bones = ?

Skull: Skull consists of bones of cranium and those of face & ear bones = ?

CRANIUM:

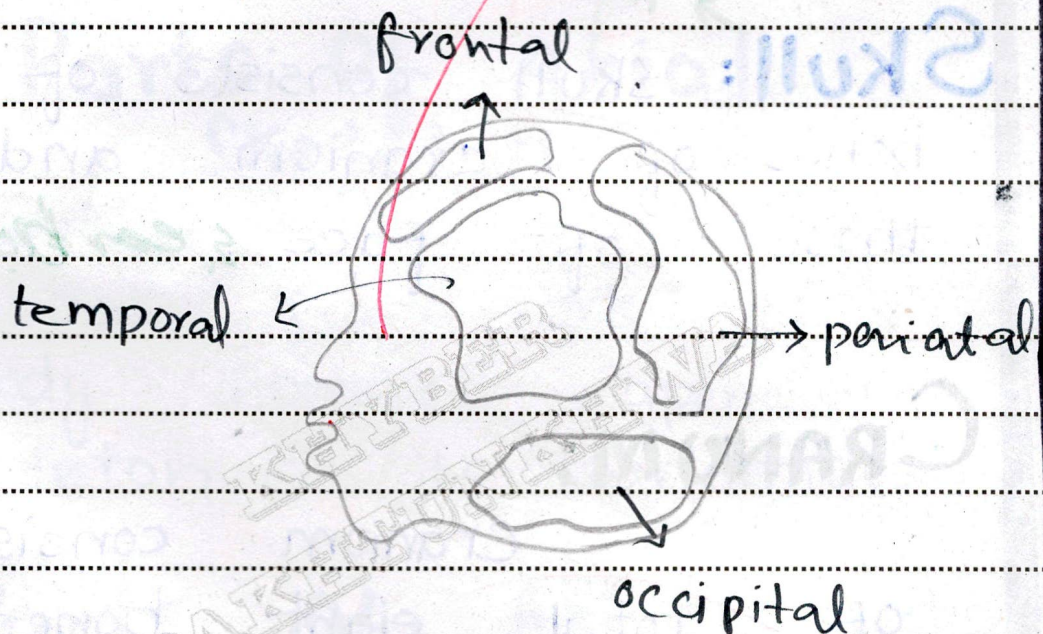
Cranium consists of total eight bones which are named according to their location.

• **Temporal bones**

These are two in number



- Pariatal: These are also two in number.
- Occipital 1 in number.
- Ethemoid 7 in number.
- Sphenoid 1 in number.



Facial Bone.

Bones of face include following bones.

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Bones of Face .

(i)

Zygomatic:

This is cheek bone and two in number.

(ii)

Lacrima:

This is found in medial wall of orbit.

(iii)

Nasal:

These are two cylindrical bones which forms bridge of nose.



(iv) Inferior nasal conchae:

These are located within nasal cavity and are two in number.

(v) Palatine:

It is located on upper part of mouth forms part of hard palate.

(vi) Vomer:

It is a single bone located in inner side of nasal septum.

(vii) Mandible:

It forms part of hard palate.

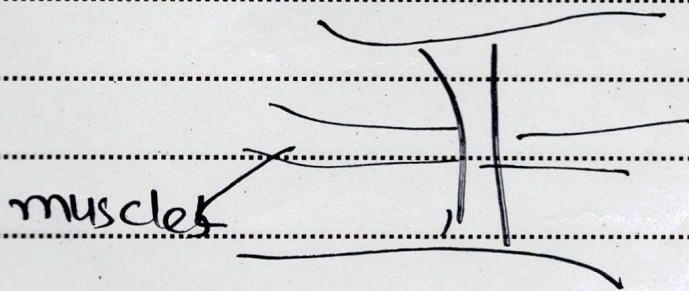


(viii) Maxilla:

It forms lower jaw bone. It is the only movable bone of body.

2) NECK REGION:

It consists of single bone called (hyoid) bone which is only bone in neck region. It is the place of attachment of skin muscles.

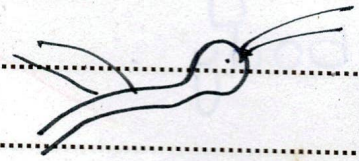




(3) Ear Oscicles:

Each ear consists of three bones. These auditory ossicles are -

- Malleus
- Incus
- Stapes



Stapes is the smallest bone of body.

(4) Sternum:

Sternum consists of a chest bone in thorax region. Ribs are attached to sternum.

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Fig. No.

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B-19

Spinal Cord Vertebrae.

Spinal cord consists
of 33 vertebrae.
They are named according
to their location.

Cervical vertebrae. It consist
of 7 cervical vertebrae.

Thoracic vertebrae. It
consists of 12 thoracic
vertebrae.

Sacral vertebrae. It consist
of 5 vertebrae.



Lumbar Vertebrae:

It consist of 5 vertebrae which are fused together.

Coccygeal Vertebrae:

It consist of 4 fused vertebrae called coccyx or tail bone. It is man's vestige of tail.

RIBS:

There are 12 pairs of ribs in thorax region. Among them 10 are attached to sternum. Out of ten, 7 are true ribs and connected to sternum while there are



False Ribs :

(3) three ribs called false ribs which are connected to sternum through costal arch.

The last two ribs are called floating ribs as they are not connected to sternum. They provide protection to kidney.

