

SECTION B

QUESTION 2

ANSWER THE QUESTIONS

ANSWERS

ANTI DIURETIC HORMONE

Anti Diuretic Hormone is a hormone which is secreted by the posterior pituitary gland.

TARGET ::

Target of the Anti Diuretic Hormone is the kidney.

Function :: (Absorption of water) ::

Function of the Anti Diuretic Hormone is that it act upon the renal tubules of kidney for reabsorption of water. It also act upon the collecting duct so that it become permeable to the water and then water is reabsorbed here and water level is maintained in the body.

Secretion of ADH:

It is secreted by the posterior pituitary gland in response to deficiency of water when it is detected by hypothalamus.

OXYTOCIN:

Oxytocin is also secreted by the posterior pituitary gland.

TARGET:

Target of the oxytocin is uterus and mammary gland.

FUNCTION:

Uterus:

It act upon the uterus during the childbirth and it do continuous contraction for the expulsion of the infant from the mother's womb. It do contractions in the uterus.

Mammary gland:

It also act upon the mammary gland for the ejection of milk from the mammary gland when the mechanoreceptors in the mammary gland are stimulated.

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INVITRO FERTILIZATION:

Invitro fertilization is the fertilization outside of the body.

EXPLANATION:

Invitro fertilization is the fertilization done outside of the body. It is the fertilization done outside the body and then zygote is transferred to mother.

FACTORS CAUSING IVF:

FALLOPIAN TUBE BLOCKED:

Factor of IVF is that when the fallopian tube of the mother is blocked so we do invitro fertilization and then transfer zygote to mother again.

MECHANISM:

We know it is a fertilization done outside the body.

⇒ Take sperms.

We take sperms from the male.

⇒ Take Eggs:

We increase egg formation by certain hormones and then take out these eggs from the female.

⇒ Place in A Dish:

Both egg and sperm are placed in a dish where the sperm fertilizes the egg.

⇒ Fertilized zygote:

The fertilized zygote is transferred back to the mother for the development of embryo.

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MENDEL CHOOSE PEA PLANT:

Mendel choose the pea plant for his experiments.

REASONS:

EASY TO GROW:

Mendel choosed the pea plant for his experiment because it was easy to grow in the soil. There was no such difficulties in growing the pea plant. It was so simple to grow the pea plant in a soil unlike other plants.

SHORT LIFE CYCLE:

The pea plants have a short life cycle. The pea plants don't take much time for maturation or to become an adult plant to show different characteristics. It had a short life cycle, it grows and develops in a short tenure of time.

SELF POLLINATION:

Mendel used pea plants. They can do the self pollination. They were able to pollinate with its own flowers. They can pollinate with their own flowers.

CROSS POLLINATION:

The pea plants were able to do the cross pollination.

They can do the pollination with the flowers of other plants.

DISTINCT CHARACTERS:

They were having distinct characters like seed shape, seed colour etc.

SEVEN DIFFERENT CHARACTERS:

The pea plants were having seven distinct characters which created benefit for the Mendel.



SEMI CONSERVATIVE MODEL:

In the semi conservative model, the parent DNA is conserved in two daughter strands.

Proposed: +

It was proposed by Watson and Crick

EXPLANATION:

PARENT DNA IS CONSERVED IN BOTH NEW STRANDS.

In the semi conservative model the parent DNA is conserved in the new daughter strands which are formed.

FORMS HYBRID DNA:

When the new daughter DNA are formed they are called the hybrid DNA because it consists of one new strand and one template strand of the parent.

MECHANISM

In this model, the DNA molecule become unzipped, the base pairs are broken.

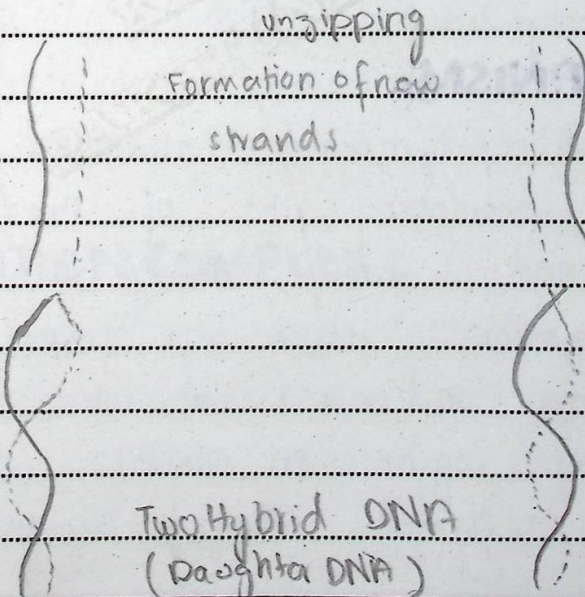
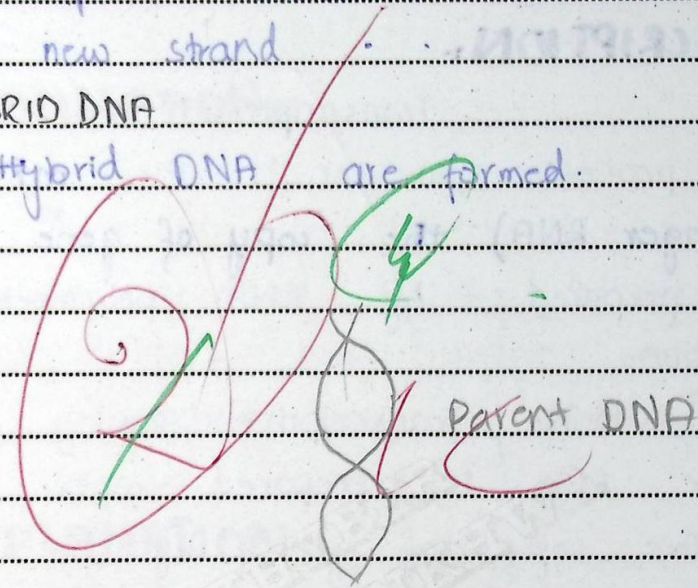
TWO TEMPLATE STRANDS:

Two template strands for formed NEW STRAND.

Each template strand creates the other new strand.

HYBRID DNA

Two Hybrid DNA are formed.



— α V β —

TRANSCRIPTION:-

Transcription is the process in which the mRNA (messenger RNA) the copy of gene is prepared by RNA polymerase.

⇒ Explanation:

In the transcription, the messenger RNA is prepared which is the copy of gene by RNA polymerase.

MECHANISM:-

The RNA polymerase attached to the promoter site of the gene and start doing the polymerization which is copy of gene and end at the terminator region in which cap hairpin is formed followed by AU Tail.

IN EUKARYOTES:-

It take place in the nucleus of eukaryotes.

TRANSLATION:-

" In the Translation, the messenger RNA is decoded by the ribosome and it form the amino acid sequence of polypeptide chain of protein."

EXPLANATION:-

In this process, the mRNA that was produced in transcription is decoded by ribosome to form amino acid sequence.

INITIATION COMPLEX:-

It consist of the initiation complex. Initiation complex consist of ribosomal units, mRNA and first aminoacyl tRNA complex.

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ENDOSYMBIOTIC THEORY OF EVOLUTION.

Endosymbiotic theory led to the evolution of eukaryotes.

ENDOSYMBIOSIS:

→ *Discovering* → ?
 " In endosymbiosis, the larger prokaryotic cell is attacked by the smaller prokaryotic cell. "

INVASION OF TWO CELLS:

It is the invasion of two prokaryotic cells.

MECHANISM:

When the larger prokaryotic cell is attacked by smaller prokaryotic cell it remains engulfed

in the larger prokaryotic cell and there it acts as a parasite or indigestible source.

Transformation into Organelle:

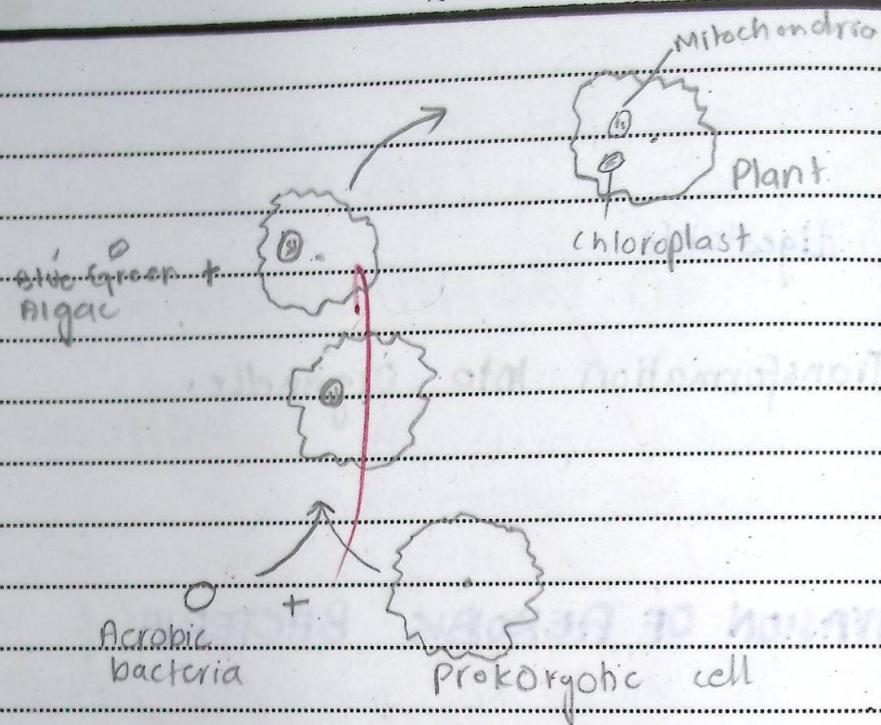
The smaller prokaryotic cell is transformed into organelle.

INVASION OF AEROBIC BACTERIA.

When the prokaryotic cell is invaded by aerobic bacteria which uses oxygen for cellular respiration, the aerobic bacteria become engulfed and transformed into mitochondria.

INVASION OF PHOTOSYNTHETIC BACTERIA:

When the cell is invaded by photosynthetic bacteria like Blue green Algae so it is transformed into chloroplast.



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RIBCAGE :-

Our ribcage protects the heart and other organs.

Total Ribs :-

It consist of 12 pair of ribs.

TRUE RIBS :-

7 seven pair of ribs are directly attached to the sternum and are known as True Ribs. They are directly attached to sternum on the front side.

FALSE RIBS :-

3 (Three) pair of ribs are indirectly attached to sternum on the front side.

Coastal Arch :-

They are not directly attached but they are attached by coastal Arch.

FLOATING RIBS :-

Two pair of ribs are not attached to sternum and they are floating that's why they are called Floating Ribs.

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SYNAPSE:

Synapse is the gap between the preaxon terminal and dendrite of post neuron.

Explanation:

Most of the active potential is not transmitted via impulse but the information is transmitted through the gap between preaxon terminal and dendrite of post neuron.

Synaptic Cleft:

The gap between the axon of preneuron and dendrite of post neuron.

ELECTRICAL SYNAPSE:

Synaptic Cleft:

Synaptic cleft is 0.3 nm

Explanation: In the electrical synapses, the synaptic cleft is small, so most of the active potential arriving at pre neuron is directly transmitted to the next neuron.

Active Potential Directly Transmitted:

In the electrical synapse, the active potential is directly transmitted to other neuron.

CHEMICAL SYNAPSE:

Synaptic Cleft: 20nm

Explanation:

In chemical synapse, the synaptic cleft is comparatively larger so the active potential arriving at pre neuron is not directly transmitted to the post neuron.

ACTIVE POTENTIAL NOT TRANSMITTED.

Active Potential is not directly transmitted but the information is transmitted through chemical messengers.

CHEMICAL MESSENGERS:

Hormones and neurotransmitter act as chemical messengers.

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SIMPLE FRACTURE:

In the simple fracture, the bone is broken but the skin is intact.

COMPOUND FRACTURE:

In compound fracture, the bone is broken and broken bone invades the skin.

SIMPLE FRACTURE

Def

Bone is broken but the skin is intact.

Skin

Skin is intact.

Bone

Bone is broken.

Penetration

It does not penetrate skin.

Recovery

Quick Recovery.

COMPOUND FRACTURE:

Bone is broken but skin is not intact.

Skin is damaged and create a wound.

Bone is broken.

Broken bone penetrates the skin.

late Recovery.

— ~~od X~~ —

RESTING MEMBRANE POTENTIAL:

In the resting membrane potential, the impulse is not transmitted.

ACTIVE MEMBRANE POTENTIAL:

In active membrane potential, the impulse is transmitted.

Resting Membrane Potential

Impulse is not transmitted

Transfer of Impulse

Neuron does not transmit impulse
charge on outside
Outside of membrane
is positive

charge on inside

Inside of membrane is
negative

Polarization State

Polarized State

Active Membrane Potential.

Impulse is transmitted.

Neuron transmit the impulse

Outside of membrane is
negative

Inside of membrane
is positive.

Depolarized state.

Membrane Potential

Membrane Potential

is -70 MV

Membrane Potential

is 50 mV

Influx of Na^+ ions

No influx of Na^+ ions

Influx of Na^+ ions

Na^+ Voltage gates

closing of Na^+ Voltage gates

opening of Na^+ Voltage gates

Leakage of K^+ ions

Leakage of K^+ ions

No leakage of K^+ ions

SECTION C.

ANSWER 1:

AXIAL SKELETON:

Axial skeleton consist of the skull, ear, neck, vertebral column, ribcage.

SKULL:-

Skull is the most important part of the body. It consists of brain which is protected by cranium.

Skull consists of the
Cranium (8 Bones)
Face (14 Bones)

Cranium :-

Cranium protects the brain. It consists of paired and unpaired bones.

PAIR BONES:-

Parietal and Temporal

Unpaired :-

Frontal, Occipital, sphenoid, ethmoid.

FACIAL BONES:- (14 Bones)

It consists of 14 Bones.

Pair Bones:-

- ⇒ Palatine Bone
- ⇒ Maxilla Bone
- ⇒ Lacrimal Bone
- ⇒ Nasal Bone
- ⇒ Inferior Nasal Conchae
- ⇒ Zygomatic

Unpaired Bone

- ⇒ Vomer
- ⇒ Mandible

EAR:-

There are two ears in the body.

Each ear consists of

- ⇒ Malleus
- ⇒ Incus
- ⇒ Stapes

NECK

Neck consists of

- ⇒ Hyoid Bone

It is present at cervical vertebrae

VERTEBRAL COLUMN

Vertebral column is running posterior of the body. It gives support to body. It protects the spinal cord.

It consists of 33 vertebrae

- 7 cervical vertebrae
- 12 thoracic vertebrae
- 5 lumbar vertebrae
- 5 sacral vertebrae
- 4 coccyx or tail bone

RIBS

Our body consists of the ribcage. It is attached to each vertebrae of thoracic and on front attached to sternum.

Total Ribs:

It consists of 12 pair of ribs.

True Ribs:

7 pair of ribs are directly attached to sternum and are called True Ribs.

False Ribs:

3 pair are indirectly attached to sternum by costal arch and are called False Ribs.

Floating Ribs:

2 pair of ribs are not attached to sternum and known as floating ribs.

STERNUM:

Our body consists of one sternum bone in the chest cavity.

ANSWER #2:

→ TRANSLATION :

It is a process in which mRNA (messenger RNA) is decoded by the ribosomes to produce specific amino acid sequence of polypeptide.

• In Eukaryotes :

In eukaryotes it occurs at the endoplasmic reticulum.

• Explanation :

In this process, the mRNA previously produced in transcription which is the copy of gene is decoded by the ribosomes to produce amino acid sequence.

It occurs in three steps

- ⇒ Activation of Amino Acids.
- ⇒ Formation of Initiation complex
- ⇒ Polypeptide Elongation

ACTIVATION OF AMINO ACIDS :

When the mRNA is exposed, then the specific tRNA molecules get activated and they attach themselves with the specific amino acid required in the process.

tRNA molecule attaches to the specific amino acid and form the

“aminocyl tRNA complex”.

It is catalyzed by **† Aminocyl tRNA Synthase**.

★ FORMATION OF INITIATION COMPLEX :

Initiation complex is formed by the combination of ribosomal units, mRNA and the first aminocyl tRNA complex.

→ FIRST STEP ::

First the tRNA molecule which is attached to the chemically modified methionine attaches to the smaller ribosomal unit by initiation factor.

→ SECOND STEP ::

In the next step, the mRNA attach to the ribosomal unit which is smaller by another initiation factor.

→ A SITE ::

Aminoacyl site is the site where mRNA is exposed and aminoacyl tRNA complex is attached.

→ P SITE ::

P site (Peptidyl) is the site where the first aminoacyl t-RNA complex is attached to smaller ribosomal unit.

→ E SITE ::

E site (Exit) is the site where the empty tRNA is released.

POLYPEPTIDE ELONGATION.

→ FIRST STEP ::

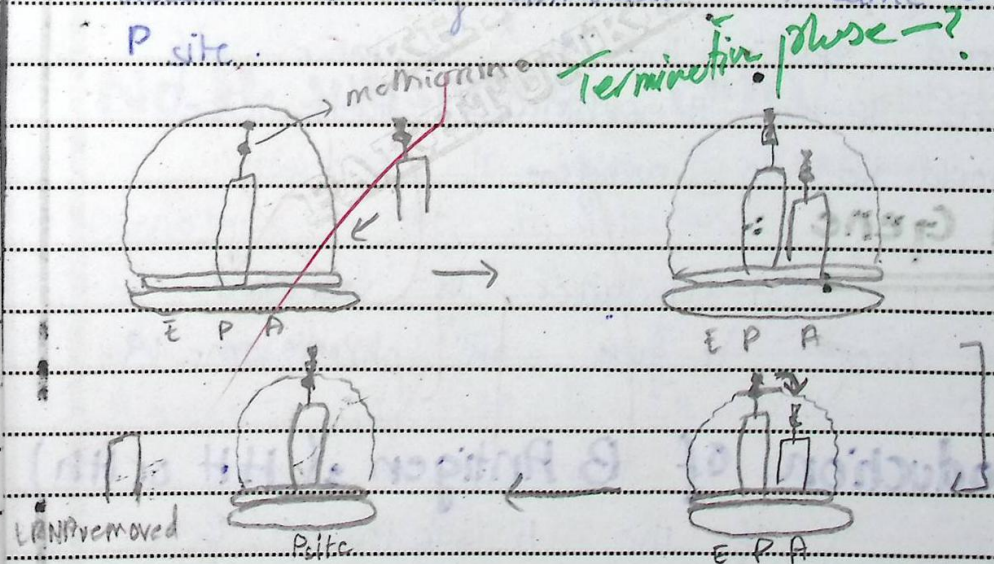
When the mRNA is exposed at A site, the specific tRNA attached to amino acid is attached to the A site.

→ SECOND STEP ::

Peptidyl transferase transfer the amino acid at P site to the A site.

→ Third step:

When mRNA is moved forward, the empty tRNA molecule at P site is removed from E site and tRNA molecule containing amino acid come to P site.



ANSWER 3BOMBAY PHENOTYPE:

It is the type of epistasis in which the blood is phenotypically O but genotypically like A, AB, B.

ANTIGEN DEPEND UPON H SUBSTANCE.

We know antigen production depend upon the H substance. If there is no H substance then there would be no antigens.

H Gene :

H substance is secreted by the H gene on chromosome 19.

Production of B Antigen: (HH or Hh)

If the H substance is present then the allele B will convert to B enzyme and act on the

H substance and will make it the B Antigen.

Production of A Antigen: (HH or Hh)

If H substance is present, then the allele A will convert to A enzyme and act on the H substance to produce A Antigen.

No H substance (hh): Bombay Phenotype.

However in case of Bombay Phenotype, the H substance is not secreted by H gene because alleles are recessive (hh) and Allele A and B cannot act on the H substance to make it Antigen. because there is no H substance.

Antigen cannot be produced without H substance.



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Applications of PCR:-

Applications of Polymerase Chain Reaction

Identification Of Microbes:-

Used for Identification of Microbes.

DETECT SERIOUS ILLNESS:-

It is used to detect serious illness.

WIDE USE IN INDUSTRY:-

Wide use in industry.

FINGERPRINTING:-

DETECTION OF DISEASES: (HIV)

Detection of HIV

which is a virus.

DETECTION OF MUTATION:-

DNA TEST:-