



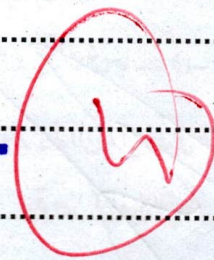
" SUBJECTIVE PART "

" SECTION - B "

QUESTION No. 02 :-

- : Part (i) : -

a) Vasopressin or ADH



Origin

Vasopressin or Antidiuretic Hormone is secreted from the posterior lobe of pituitary gland.



Function

(water retention)

ADH is secreted when the water level in our body is low. Basically ADH makes the collecting ducts more permeable to water. Hence, water is reabsorbed, making the urine concentrated. When the water level is high ADH secretion is inhibited.

b) Oxytocin

Origin

Oxytocin is secreted by the posterior pituitary gland.

Function

Oxytocin controls the

uterine contractions during child-birth and also plays a role in milk production from the breasts.

— : Part (ii) : —

Invitro Fertilization

→ introduction : —

Invitro Fertilization is an artificial method of conceiving a baby.

It is a method used for people who are unlucky in conceiving a baby.

→ working : —



In the process of invitro fertilization a doctor gives medicine to the female that increases her egg count. Then the egg and the sperm from the male are fertilized in the laboratory and a zygote is produced which is relocated inside the female's uterus. Around 90 % of the times, the female is successful in getting pregnant. This is why invitro fertilization is the best method for artificially conceiving a baby.

Importance of IVF = ?

— : Part (iii) : —

Gregor Medal

→ introduction :-

Gregor Mendel was an Austrian monk who is also known as "Father of Genetics" due to his famous garden pea plant experiments.

→ advantages of pea plant :-

Q. Mendel chose to study garden pea plant due to the following reasons.

- It was ~~easy~~ to grow, i.e., it could be grown in garden pots.
- It could grow easily within 6 months.
- It had ~~seven~~ distinct traits that could be studied easily.
- It had the ability to self-fertilize.
- It could undergo cross-pollination.



- : Part (iv) :-

Semi-conservative Model

→ introduction :-

This model was proposed by watson and crick and is thought to be the most accurate model for DNA replication.

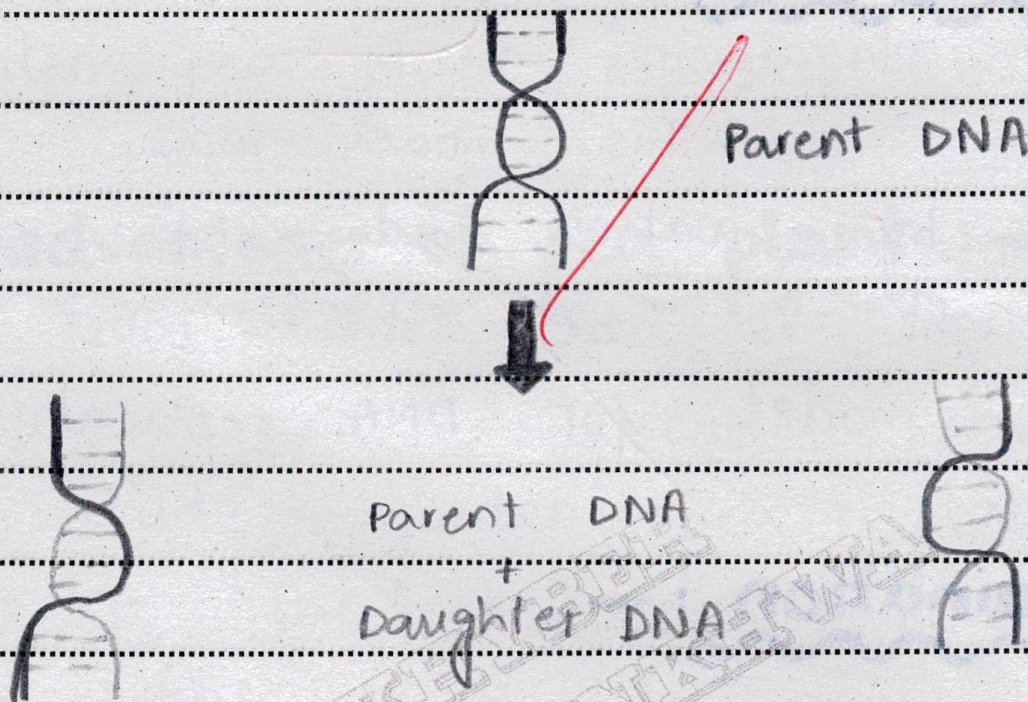
→ explanation :-

This model proposes that a parent DNA, when undergoes DNA replication it becomes unwind & a new daughter & strand is attached to the parent DNA strand in this way the parent DNA is partially conserved in the

next generation.

→ illustration :-

↓ semi-conservative Model



- : Part (vii) :-

Deforestation

→ definition :-

The process of removal of forests is called deforestation.

→ impact on environment :-

Deforestation has many adverse affects on the environment. some of which are given below.

• Habitat loss

Deforestation causes habitat loss for the animals whose natural habitat is the forest.

• Soil erosion

Deforestation is a party to soil erosion.

• Flooding

Deforestation causes more

Flooding in areas near to water bodies.

- **CO₂ surge**

Deforestation causes global rise in CO₂ concentration.

- **GreenHouse Effect**

Deforestation has a great role in increasing green house effect.

— : Part (viii) :—

Biotechnology

→ definition :—

Biotechnology is the branch of science that deals with use of micro-



organisms and the deliberate manipulation of their DNA for the welfare of human beings.

→ importance :-

Biotechnology has immense importance in every day life. A few examples are given below that signify the importance of biotechnology in everyday life.

E.g

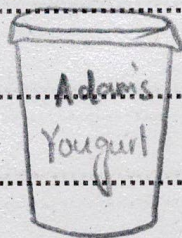
1) Production of Dairy Products

Biotechnology has enabled us to produce a variety of dairy products such as yougurt, butter, etc. By the action of some bacteria.

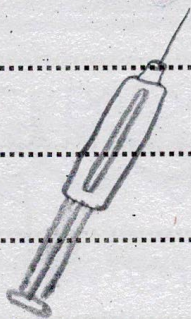
2) Insulin Production

Biotechnology has enabled us to produce artificial insulin. This is very helpful for people suffering from diabetes mellitus. This artificial insulin is produced from ~~E. coli~~.

→ illustration



Butter ↑



Insulin
shot





- : Part (ix) :-

Ribs

→ introduction :-

Ribs are a part of skeletal system found in the thoracic cavity. Its main function is the protection of lungs and heart.

• No. of bones

It has a total of 12 pairs of bones.

→ True Ribs :-

↳ definition :-

True Ribs are

those ribs that are directly connected to the sternum.

↳ No. of bones :-

There are 7 pairs of true ribs that are connected to the sternum.

→ False Ribs :-

↳ definition :-

False Ribs are those ribs that are indirectly connected to the sternum.

↳ No. of bones :-

There are 3 pairs of false ribs. These

ribs are not connected to the sternum directly rather they are connected to the true ribs.

→ Floating Ribs :-

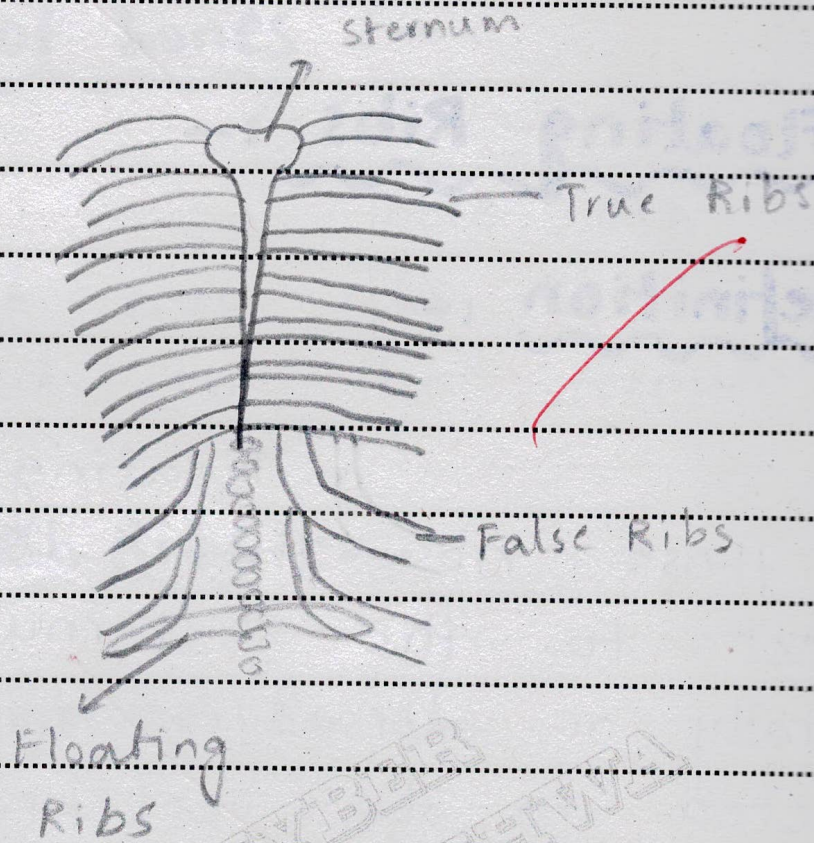
↳ definition :-

Floating Ribs are those ribs that do not connect to the sternum ventrally or dorsally. They are connected to the vertebral column.

No. of bones :-

There are two pairs of floating ribs in the human body.

→ illustration



— : Part (x) : —

Skin

→ introduction :—

Blubber? Memoreceptors?
 Pale? " "
 Vasoconstrict
 Vaso dilator
 Mamm?



The outer epidermis of human body is known as skin.

It is the first line of protection of humans against pathogens. Beside its other functions, it can act as a thermoregulatory organ.

→ role in thermoregulation

Skin has a great role in thermoregulation and can be considered as a thermoregulatory organ. Skin has different adaptations to hot and cold ~~outer~~ environment. For instance when the internal body becomes heated, sweating occurs which causes cooling. Similarly, the hair follicles in the skin stand upright in



response to cold temperature.

— : Part (xi) : —

Simple Fracture

- 1) The skin remains intact in this type of fracture.
- 2) The structures surrounding the bone are relatively less damage.
- 3) A cast is used to reduce simple fracture.
- 4) The average healing period depends upon the bone but intermediate bones take around 6 weeks to heal.



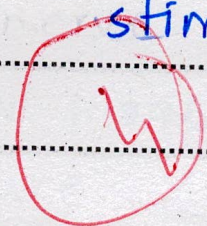
Compound Fracture

- 1) The skin does not remain intact in this type of fracture.
- 2) The structures surrounding the bone are very damaged.
- 3) surgery may be needed, or rod or wires are used to reduce the fracture.
- 4) The healing period is greater in this type of fracture.



- : Part (xii) :-

Resting Membrane Potential

- 1) occurs when no stimulus is present. 
- 2) It has a voltage of -70 mV.
- 3) concentration of Na^+ ions is greater outside the membrane.
- 4) concentration of K^+ ions is greater inside the membrane.
- 5) outside membrane is relatively positive
- 6) inside membrane is relatively



negative.

Action Membrane Potential

- 1) occurs when stimulus is present.
- 2) It has a voltage of 50 mV.
- 3) concentration of Na^+ ions is greater inside the membrane.
- 4) concentration of K^+ ions is greater outside the membrane.
- 5) outside membrane is relatively negative.
- 6) Inside membrane is relatively positive.

SECTION - C

Question No. 05 :-

Axial skeleton

↳ definition :-

Axial skeleton is the type of skeletal system which forms the axis of the body.

↳ explanation :-

Axial skeleton consists of those parts that form the axis of the skeletal system many structures arise from the axial



skeleton.

• Composition

Axial skeleton
is basically composed of cranial bones, Facial bones, Hyoid bone, Sternum, Ribs and Vertebrae.

• Total Bones

The total number of bones in the axial skeleton are 126.

→ Cranial Bones

There are 8 bones in the cranium. Namely :-

- 1) Frontal
- 2) occipital



- 3) Sphenoid
- 4) Ethmoid
- 5) Parietal (2)
- 6) Temporal (2)

→ Facial Bones

There are 14 facial bones. Namely :-

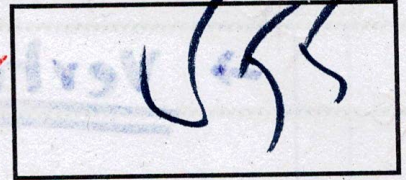
- 1) Vomer
- 2) Maxilla (2)
- 3) Mandible
- 4) Nasal conchae (2)
- 5) Inferior nasal conchae (2)
- 6) Palatine (2)
- 7) Zygomatic (2)
- 8) Lacrimal (2)

→ Ear Bones

There are 3 ear



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bones, malleus, incus, stapes.

→ Neck bone

one hyoid bone is present.

→ Sternum

one chest bone called sternum is present.

→ Ribs

There are 12 pairs of ribs. 7 pairs of ribs are true, 3 false and 2 floating ribs.



→ Vertebrae

There are 33 vertebrae constituting the vertebral column. 7 in the cranial region, 12 thoracic, 5 lumbar, 5 pelvic, 4 fused bones in the sacral and coccyx region.

Question No. 06

a) Insight Learning

↳ definition :-

The type of behaviour that chooses reason over trial-and-error



↳ explanation

A scientist by the name of Kohler conducted an experiment to explain insight learning in chimpanzees. He suspended some snacks at the top of a room full of chimpanzees. He put a stick and some boxes in that room. The ~~more~~ chimpanzees first tried to knock out the snacks but later they learned to stack the boxes to reach the snacks. This proved that insight learning enables one to use his wisdom.

b) Transport of CO_2

CO_2 can be ~~kind~~ transported from ~~the~~ various body tissues to the lungs in 3

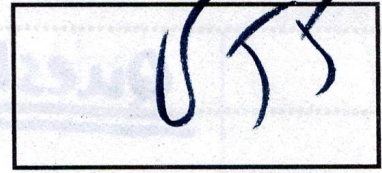


forms.

- As Bicarbonate ions
- [Through the Plasma]
- [Attached to haemoglobin]

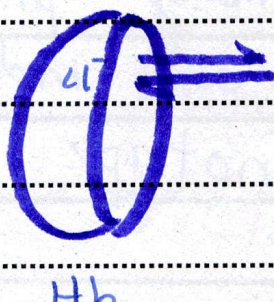
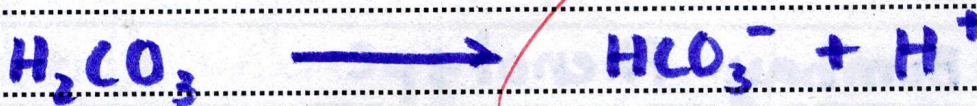
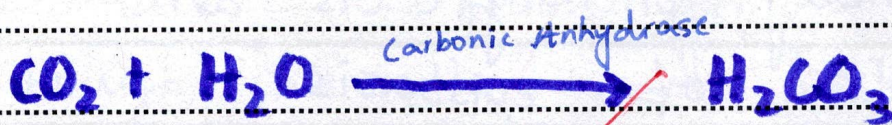
→ As Bicarbonate Ion

The concentration of CO_2 in tissues is greater than the blood. Hence the CO_2 is actively transported to the haemoglobin. Here it reacts with H_2O to form bicarbonate ions. The acidity is buffered by the chloride ions. This phenomenon is called Hamburger's phenomenon. CO_2 travels like this 70% of the times. The CO_2 when reacts with H_2O forms carbonic acid which later on forms bicarbonate ions. When bicarbonate ions are produced the release



H^+ ions also happens. The acidity produced by H^+ ions is buffered by haemoglobin. The HCO_3^- leave Hb which is equalized by the addition Cl^- ion in Hb. This is called chloride shift or Hamburger's phenomenon.

The reactions occur in the following ways.



The exact opposite of these reactions occur when CO_2 is delivered to lungs and O_2 is picked up.

Question 04

(a)

Bombay Phenotype

→ Epistasis

Epistasis is the interaction of genes of different loci on different chromosomes.

→ Bombay phenotype is an example of epistasis.

→ Bombay Phenotype

Bombay phenotype is basically when an individual has a certain genotype but

$$4 \times 4 = 16$$

4



displays a completely opposite phenotype.

→ explanation

Bombay phenotype was first expressed in the ABO blood group. Basically the H substance plays the main role in Bombay phenotype. It interacts chromosome A and B on chromosome 19. This causes the person or an individual have Bombay phenotype to have O blood group phenotype. Although he has an AB blood group genotype. This is a very rare form of epistasis.

What Gene of
Genetic of H-Gene)
Genotype?



(b)

PCR

(4)

Abbreviation
Reaction

Polynuclease Chain

use

This is a machine use to replicate DNA and produce millions of its copies.

Applications

1) DNA Replication

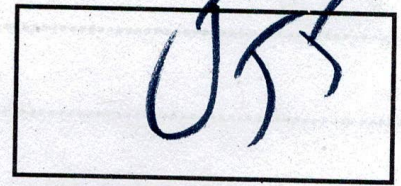
PCR can be used to replicate DNA and makes thousands of millions of its copies.

2) Fingerprinting

PCR can be used to detect fingerprint of criminals by the process of DNA replication.



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3) Study of Pathogens

PCR can be used to study structures and affects of various pathogens

4) Safeguarding Isolated DNA

PCR can be used to preserve and make many copies of that required isolated DNA

5) Study of Faulty Gene

PCR can be used to study faulty genes by isolating that DNA.