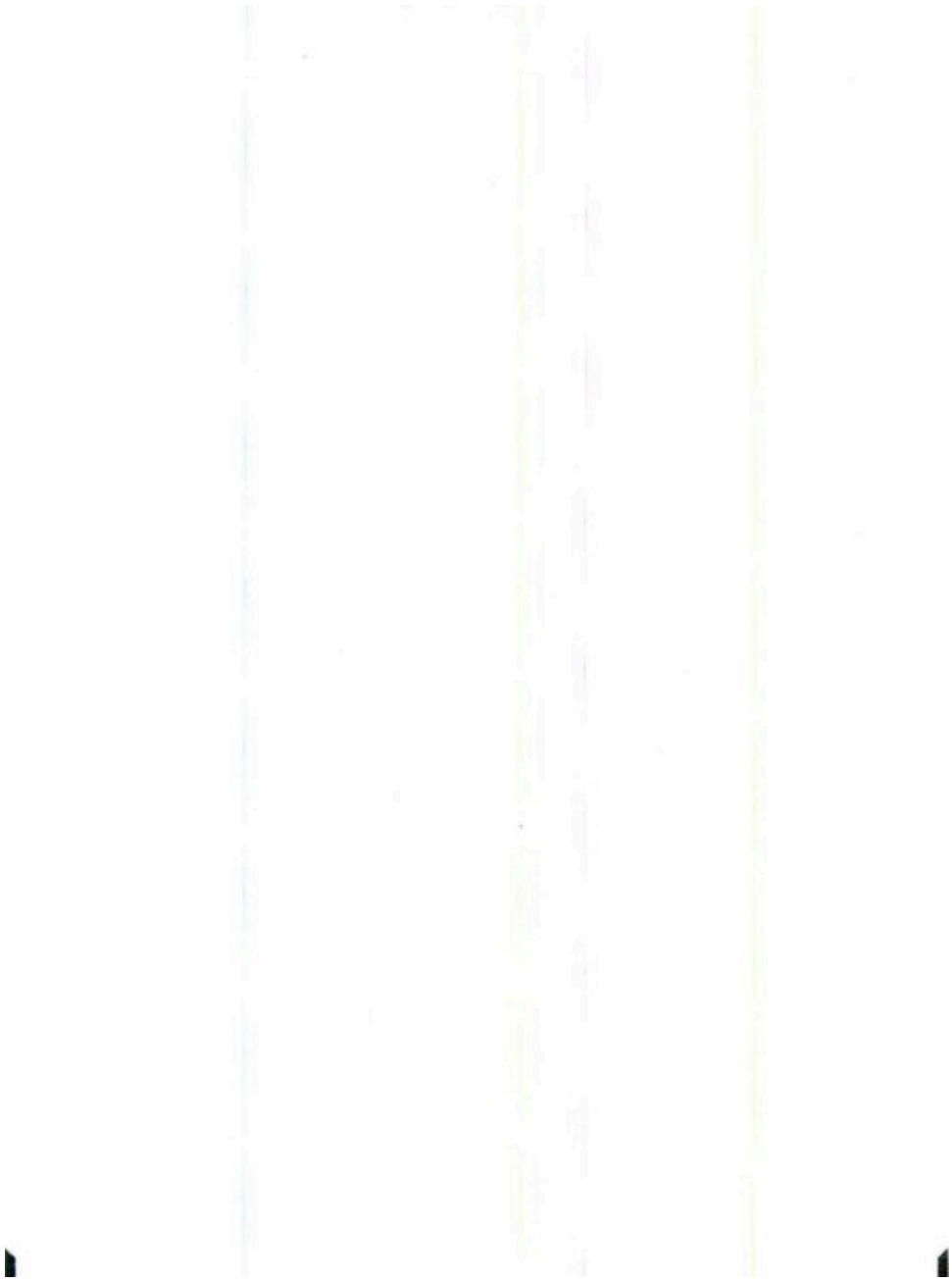
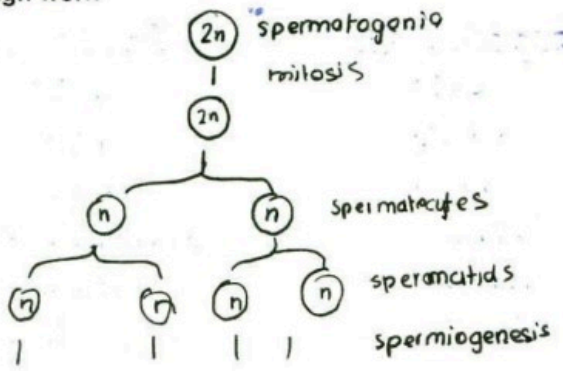




Use for rough work



Q. No. 2 Part (i) **Stimulus:**

Any change in an organism's environment is termed as stimulus.

⇒ The change can be Internal or External.

For Example:

① Hunger is an internal stimulus felt by us when the body needs nutrition. It is generated by the hypothalamus.

② Change in temperature is an external stimulus. When we touch a hot object, we feel the high temperature.

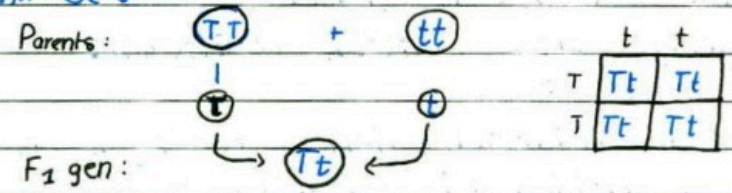
Q. No. 2 Part (ii) The method of asexual reproduction shown in the diagram is called **Budding**.

Explanation:

Budding is a form of asexual reproduction that occurs by growing an outgrowth on the parent's body. It occurs in some species like hydra as shown. The outgrowth gets nutrition from the parents body and stays attached for a while. After some time, it separates and becomes a hydra with the same genetics as the parent hydra. Essentially the hydra is a clone of its parent.

This is how budding works.

Q. No. 2 Part (iii) If a homozygous tall pea plant (TT) is crossed with a homozygous dwarf plant (tt), the resulting pea plant will be:



We can see that only one type of pea plant, a heterrozygous tall pea plant (Tt) is produced in the first filial (F_1) generation.

Phenotype ~~rat~~: All offspring are tall heterozygous pea plants as the Tall gene is dominant.

Genotype: Genotype of F_2 generation is (Tt). Heterozygous tall pea plant.

Q. No. 2 Part (iv) **Role of Liver in Digestion:**

⇒ The liver produces **bile.**

⇒ Bile is a greenish-yellowish liquid that is released into the deodenum during digestion.

⇒ The bile emulsifies fats, that is, it increases the surface area of fats for the action of lipase enzymes turning fats into drops called emulsion. This process is called **emulsification.**

⇒ Bile also contains bicarbonate ions that help neutralize the acidic chyme that enters the deodenum from stomach.

⇒ Hence, the liver plays a role in easy digestion of fats and neutralizing the acidic chyme in the deodenum during digestion.

Q. No. 2 Part (v) **Treatment of Myocardial Infarction:**

Treatment of myocardial inforction involves:

① Use of enzymes to dissolve clot that causes it.

② Coronary Bypass Surgery is done in which a blood vessel from another part of the body is grafted in the heart to improve blood flow to the heart muscles.

Preventive Measures:

① Avoid foods rich is salts and fats.

② Do exercise or walk daily.

③ Quit smoking.

Q. No. 2 Part (vi) **Bronchitis:**

It is a respiratory disease in which the air passageways including trachea, bronchus and bronchioles are narrowed. It is basically the narrowing of air passages.

Cause: It is often a result of an acute infection. Smoking also causes bronchitis.

Symptoms: The main symptom is coughing. Excess mucus is also a symptom along with breathlessness.

Q. No. 2 Part (vii) **Spermatogenesis:**

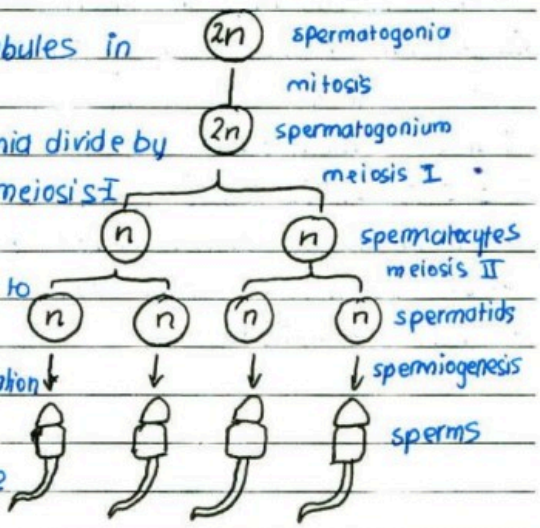
It is the process by which sperms are produced in the testes of a male.

⇒ It occurs in the seminiferous tubules in the testes of male.

⇒ Diploid cells called spermatogonia divide by mitosis. Then it is divided by meiosis-I resulting in spermatocytes.

⇒ Spermatocytes undergo meiosis-II to form spermatids.

⇒ Spermatids undergo a transformation forming a tail, acrosome and a mitrochondrial ring forming mature sperm.



Q. No. 2 Part (viii) **Blood Clotting:** Following steps are involved in blood clotting:

- **Injury:** A blood vessel is ruptured. Nearby platelets are activated.
- **Clotting:** Platelets gather around the injury site. They release signals that attract other platelets.
- **Platelet Plug Formation:** Platelets form a sticky clump at the injury sight called platelet plug.
- **Release of Clotting Factors:** The platelets and injured cells disintegrate releasing clotting factors.
- **Fibrin Clot Formation:** Reactions occur between clotting factors (e.g. fibrinogen, thrombin). This results in the formation of fibrin clot. The fibrin clot makes a **physical barrier** that prevents blood loss and stops the entry of pathogens.

Q. No. 2 Part (ix)

Major Type of Pathogens	Example Disease
① Bacteria	Typhoid, caused by bacteria Salmonella typhi.
② Virus	Covid-19 caused by virus SARS-Cov-2.
③ Protozoan	Malaria caused by plasmodium.
④ Fungi	Ringworms.

Q. No. 2 Part (x)

	Inspired Air	Expired Air
Oxygen	21%	16 %
Carbon Dioxide	0.04%	4 %
Nitrogen	79 %.	79 %.
Temperature	Variable	Around body temperature
Water Vapours	Variable	Saturated
Dust and particles	variable	Little, if any

Q. No. 2 Part (xi) **Glomerular Filtration:**

=> It is also called pressure filtration.

=> It occurs in the renal corpuscle of nephron.

=> When blood enters the glomerulus near the bowman's capsule through afferent arteriole, the blood pressure is enough such that it causes the diffusion of small molecules into the Bowman's capsule through a semi-permeable membrane.

=> These small molecules include water, glucose, urea, amino acids etc. Blood cells are too large to pass through so they remain in the blood.

=> In this way, almost all waste molecules are transferred in the nephron, by glomerular filtration.

Q. No. 3 (Page 1)

The **Pituitary Gland** is called the Master Gland.

Why?

⇒ The pituitary gland is connected with the hypothalamus, which regulates the release of hormones in the body. Hence the pituitary gland controls the functions of all the other endocrine glands.

⇒ Hence the pituitary gland controls the secretions of all the other glands.

⇒ This is why it is called the Master Gland.

Function of Pituitary Gland:

⇒ The pituitary gland is an endocrine gland.

⇒ As it is connected to the hypothalamus, it controls the secretions of all the other endocrine glands.

⇒ It also releases hormones that play a crucial role in the body.

⇒ The analysis of the parts of the pituitary gland and the hormones they release can help us understand it's functions better.

Parts of the Pituitary Gland:

The pituitary gland has two lobes: the anterior lobe and the posterior lobe. Both secrete specific hormones.

① Anterior Pituitary Gland:

The anterior pituitary gland is the larger lobe of the pituitary gland.

⇒ It secretes several hormones that help regulate the

Q. No. 3 (Page 2) functions of the body. It secretes:

① Thyroid Stimulating hormone:

It is the hormone that controls the functioning of the thyroid gland. It stimulates the thyroid gland to release thyroxine hormone.

② Growth hormone or Somatotropic Hormone:

The anterior pituitary gland releases the growth hormone responsible for the growth of humans. If the pituitary gland releases less of the growth hormone during early ages, the person becomes a pituitary dwarf. If it is released in excess, the person becomes a pituitary giant. If it continues releasing it in adulthood, the face, hands and feet of the person enlarge in a condition called acromegaly.

③ The anterior lobe also releases hormones such as FSH and LH that stimulate the gonads, the reproductive organs.

2. Posterior Pituitary Gland:

It is the smaller lobe of the pituitary gland. It releases some hormones such as:

① Oxytocin: It is responsible for causing powerful uterine contractions during child birth. It is also responsible for mother child bonding.

② Antideuretic Hormone: It is responsible for reabsorption of water from the nephrons. In old people, it is released less, resulting in large quantities of dilute urine. This condition is termed as diabetes insipidus.

In this way, the pituitary gland plays an important role in the functioning of the body.

Q. No. 4 (Page 1) **Mechanism of Breathing:**

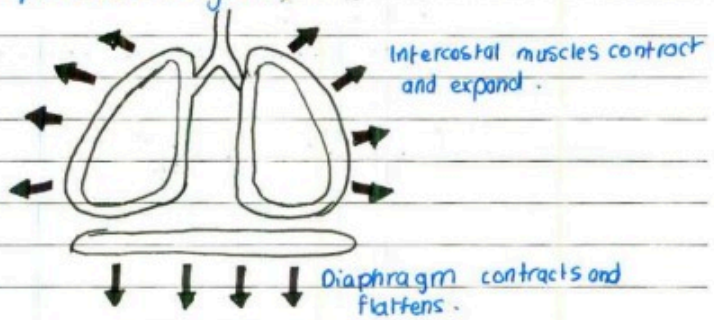
Breathing is the process of moving air in and out of the lungs. This is achieved due to pressure. Inhalation is the taking in of air and exhalation is the taking out of air from lungs.

Following is the mechanism of breathing described.

1 Inhalation:

Inhalation is the process of taking in of air by creating low pressure inside the lungs.

① The diaphragm contracts and flattens out increasing volume of lungs.
② The intercostal (rib) muscles contract and move the ribcage upwards and outwards increasing volume of lungs.
③ The increased volume of lungs results in low pressure in the lungs.
③ The air moves into the lungs as it flows towards the low pressure region.

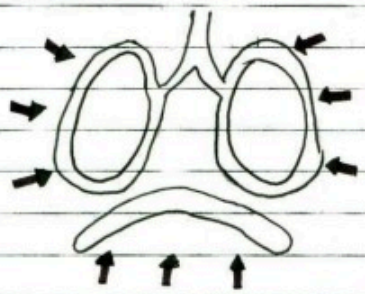


Inhalation Diagram

Q. No. 4 (Page 2) **② Exhalation:**

It is the process in which air is taken out of lungs, by creating high pressure inside the lungs

① The diaphragm muscles relax and become dome shaped again reducing volume of lungs.
② The intercostal (rib) muscles relaxes and move inwards reducing the volume of lungs.
③ This reduction in volume results in high pressure in the lungs.
④ The air moves out of the lungs due to high pressure.



Exhalation Diagram

Q. No. 5 (Page 1) **STOMACH:**

The stomach is a digestive organ in the alimentary canal.

⇒ It is a J-shaped organ and a dilated part of the alimentary canal.

⇒ It is located in the right side of the abdominal cavity just below the diaphragm.

Structure of Stomach:

⇒ The stomach is a J-shaped organ.

⇒ The end of the stomach that connects into the oesophagus is called the cardiac end.

⇒ The opening of oesophagus into the stomach is called cardiac opening.

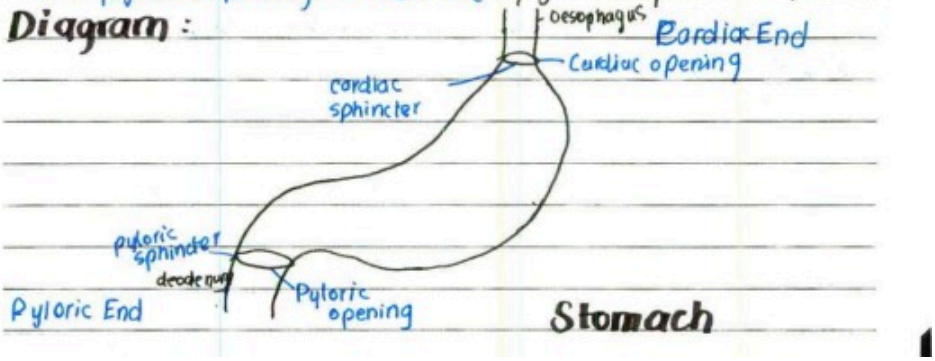
⇒ It is surrounded by a ring of muscles called the cardiac sphincter.

⇒ The other end of the stomach opens into the deodenum of the small intestine and is called the pyloric end.

⇒ The opening of stomach into the deodenum is called the pyloric opening.

⇒ There is a ring of muscles that ~~contracts~~ surrounds the pyloric opening called the pyloric sphincter.

Diagram:



Stomach

Q. No. 5 (Page 2) **Function of Stomach:**

The main function of the stomach is the digestion of food, mainly protein. Following is an overview of how the stomach functions.

⇒ On the peristaltic reflex, the cardiac sphincter relaxes and lets the food in.

⇒ The food in the stomach stimulates the release of gastric juice. The gastric juice contains:

- **Pepsin:** An enzyme that is responsible for the digestion of protein. It is released in inactive form pepsinogen.
- **Hydrochloric Acid:** It has following functions:
  ① It kills microorganisms. ② It activates pepsin
  ③ It stops action of salivary amylase.
- **Mucous:** The wall of stomach is lined with mucous which protects the stomach wall from the action of pepsin enzyme.
- **Rennin:** It is released in stomach of infants for digestion of protein.

The churning action of stomach results in formation of acidic chyme which enters the deodenum through pyloric end.

In this way the stomach functions to digest food.

Q. No. 6 (Page 1) **DIALYSIS:**

When a patient's both kidney's fail or are severely damaged, it is unable to function properly. If nothing is done about this, death is inevitable. So dialysis is the process by which urea and other waste materials are artificially filtered from the blood through different processes. In this way because of dialysis, a kidney patient can continue to live. There are two types of dialysis:

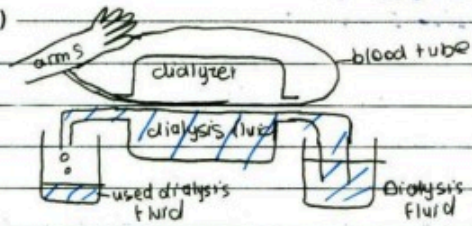
① Hemodialysis
② Peritoneal dialysis.

① Hemodialysis:

It is a process by which a patient's blood is filtered of wastes through dialysis.

=) Firstly, a catheter is ~~inserted~~ inserted into a patients vein, usually the arm.
=) The blood exits the patient's body passes through the dialyzer.
=) The dialyzer consists of dialysis fluid and blood is passed over it over a semi-permeable membrane.
=) The dialysis fluid contains sugar and salts so that essential nutrients from the blood don't leave the blood.
=) Urea diffuses through the permeable membrane into the dialysis fluid which is constantly circulated.
=) Then the blood is inserted back into another vein of the patient.
=) In this way the cycle continues the the patient's blood is filtered.

Q. No. 6 (Page 2)



Hemodialysis

=> This type of dialysis is done 2-3 times a week.

2 Peritoneal Dialysis:

=> It is another type of dialysis.

=> In this, dialysis fluid is inserted into the peritoneal cavity, a small cavity in the abdomen area.

=> The dialysis fluid is left in the cavity for 2-3 hours and then taken out.

=> In this way, wastes are extracted from the body.

=> This type of dialysis needs to be done more frequently. Around 3-4 times a day.

This is how hemodialysis and peritoneal dialysis is done to remove urea and other wastes from the body of patients who suffer from kidney failure.