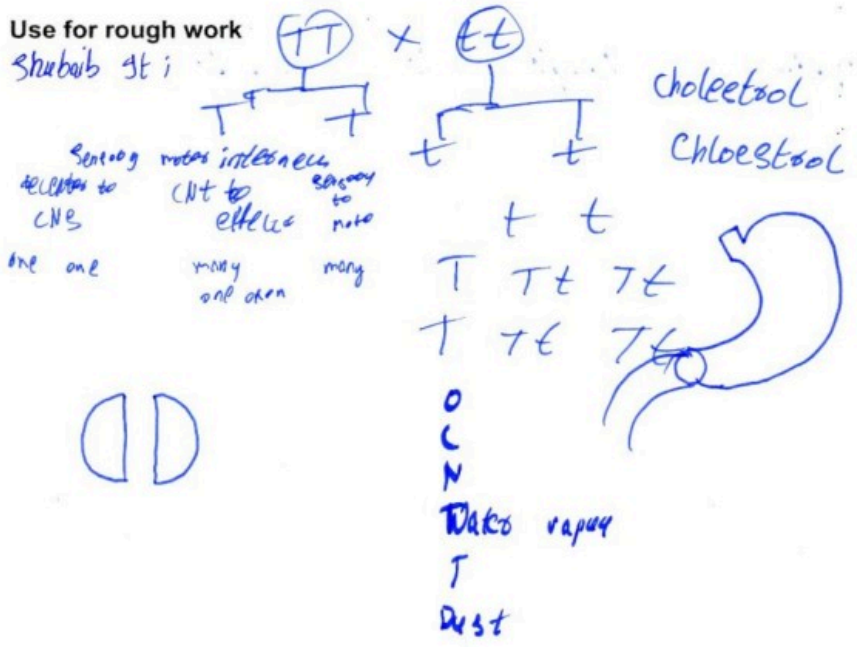
Use for rough work



Q. No. 2 Part (i) **Types of neurons:**

1) Sensory neuron 2) Motor neuron 3) Interneuron

1) Sensory neuron: It takes the nerve impulses from receptors to brain and spinal cord.
- It has one dendrite and one axon.

2) Motor neuron: It takes the nerve impulses from brain and spinal cord to effectors.
- It has many dendrites and one axon.

3) Interneuron: It is responsible for impulses to travel from sensory to motor neuron.
- It has many dendrites and axons.

Q. No. 2 Part (ii) Method: **Asexual reproduction**

Type:

Budding: In budding small outgrowth or bud is formed on the parent plant which grows and forms a complete new organism.

The bud divides by mitosis again and again, after dividing it detaches from the parent and becomes a complete new organism. It also lives independently before detaching.

e.g Hydra.

Q. No. 2 Part (iii) Trait: Tall (TT) and dwarf (tt)

Cross fertilization:

P generation TT × tt

Gametes T, T | t, t

	t	t
T	Tt	Tt
T	Tt	Tt

Genotype:

~~Phenotype~~: 100% heterozygous Tall pea plants

Phenotype: 100% Tall (dominant) pea plants.

F1 generation (Tt × Tt) → Phenotype: 3 : 1 (Dominant) (Recessive)

Genotype: 1 : 2 : 1 (Homozygous dwarf pea plant)

Homozygous Tall pea plant; Heterozygous Tall tea plant

Q. No. 2 Part (iv) **Role of liver:**

1) Liver cells manufactures 'bile'.
2) Liver stores excess quantity of glucose as 'glycogen'.
3) Liver converts glycerol and amino acids into 'glucose molecules'.
4) It 'stores' 'fat soluble vitamins' (A, D, E and K) and 'mineral ions' such as iron.
5) It 'destroys' old red blood cells.
6) Liver 'removes' amino group from amino acid. It is called deamination.

Q. No. 2 Part (v) **Treatment:**

1) Angioplasty: Angioplasty is the mechanical widening of a narrow or totally blocked coronary arteries.
2) Medical treatment includes use of 'enzyme' that dissolves blood clot.

Preventive measures:

1) Maintain healthy bodyweight
2) Avoid food rich in salts and fats
3) Stop smoking
4) Avoid stress

Q. No. 2 Part (vi) **Bronchitis:** Bronchitis is defined as the inflammation of lining of air passage ways ~~like~~ including trachea, bronchi, bronchioles.

Cause: Bronchitis can be acute or chronic. Acute bronchitis is caused by seasonal viruses like flu. Chronic bronchitis is caused by smoking and air pollution

Symptoms:

① Coughing and Breathlessness
② secretion of excess mucus

Q. No. 2 Part (vii) **Spermatogenesis:** It takes place in testes of male. Spermatogenesis is defined as the process in which 'four haploid cells' (sperm cells) are produced. It starts from puberty and remains 'continue throughout the life'. This process occurs in 'males.' In spermatogenesis, some cells in the seminiferous tubules divide by mitosis to produce diploid cells called spermatogonia. Spermatogonia divides by mitosis and produce primary spermatocyte. Then primary spermatocyte divides by meiosis I into secondary spermatocyte and it divides by Meiosis II and divides into spermatids. Spermatids are non-motile, first they become motile and then converts into sperms.

Q. No. 2 Part (viii) **Blood clotting:** Blood clotting is the process to prevent excessive bleeding from injury. Steps are:

1) Injury: Blood vessel is injured and exposes 'collagen' to activate platelets.
2) Constriction: Blood vessel 'constricts' to the injury site to reduce blood flow.
3) Platlet activation: Platlets 'release chemical signals' which stick to injury site.
4) Platlet plug formation: 'Sticky platlets' clump together to form platlet plug.
5) Release of clotting factors: Injured tissue and platlets disintegrate at the site of injury and clotting factors are released.
6) Fibrin clot formation: Fibrongin and thrombin lead to fibrin clot formation.
7) Fibrin clot: A solid mass is formed that provides physical barrier against pathogens.

Q. No. 2 Part (ix) Mean:

$$\bar{x} = \frac{\Sigma x}{n} = \frac{\text{Sum of all values}}{\text{Total no. of values}}$$

$\Sigma x = 100$, $n = 6$

putting values

$$\text{Mean} = \bar{x} = \frac{100}{6} = 16.67$$

Mean = 16.67 patients per month

Mean ≈ 17

Mode = Most repeated value in dataset

Hence, $\hat{x} = 22$ patients per month

Q. No. 2 Part (x)

Gases	Inspired air	Expired air
Oxygen	21%	16%
Carbondioxide	0.04%	4%
Nitrogen	79%	79%
Water vapours	Variable	saturated
Temperature	Variable	Body temperature
Dust	Variable	Less, if any

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

It is the movement of 'small molecules' across the ~~cell membrane of nephron~~ glomerular wall due to blood pressure.

When blood travels in glomerulus ~~small molecules like~~ blood pressure is sufficient to cause small molecules like water, salts, vitamins and wastes to move into bowman's capsule.

The fluid which separates from the blood is called glomerular filtrate. Blood proteins and red blood cells are to large to be part of this filtrate so they remain in blood.

Q. No. 3 (Page 1) **Diabetes:**

Diabetes is defined as the metabolic disorder characterized by high blood sugar levels.

Chronic disease: It is a chronic disease.

Types of diabetes:

1) **Type 1 diabetes:** (T1D)

- It is a chronic disease.
- It is an 'autoimmune disease' which kills insulin producing cells in the pancreas.
- Treatment includes daily injections of insulin.

2) **Type 2 diabetes:** (T2D)

- It is a chronic disease.
- It is caused by 'impaired insulin secretion' and forms insulin 'resistance'.

3) **Gestational diabetes:**

- It develops during pregnancy, it is usually cured after delivery.
- Medications include: healthy diet, exercise.

Q. No. 3 (Page 2)

Effects on Human body:

1) Short-term effects:

(i) Increased thirst (ii) Urination

(iii) slow healing of wounds (iv) nausea

(v) fatigue (vi) blurness of vision

2) Long-term effects:

(1) High blood pressure (2) High Lipid level

(3) High ~~cholestool~~ cholesterol level (4) Heart ~~attac~~ diseases

(4) kidney damage (5) High uric-acid level

(6) retina damage (7) High risk of Covid-19.

Q. No. 4 (Page 1) **Breathing**: Breathing is a mechanical process which involves the movement of air in and out of the lungs.

It consists of two phases: 1) Inhalation 2) Exhalation

1) **Inhalation**: When we inhale following events appear:

i) **Contraction of diaphram**: The muscles of diaphram 'contracts'. This pulls the diaphram 'downwards'.

ii) **Contraction of intercostal muscles**: The intercostal muscles contract, this pulls the ribs upwards and outwards.

iii) The lungs ~~contract~~ expands. When the volume increases pressure decreases in the lungs.

iv) Air is moved into the lungs from nose/mouth.

2) **Exhalation**: When we exhale, following events appear:

i) **Relaxation of diaphram**: The muscles of diaphram 'relaxes', this makes the diaphram become 'normal shaped / Domed shape'.

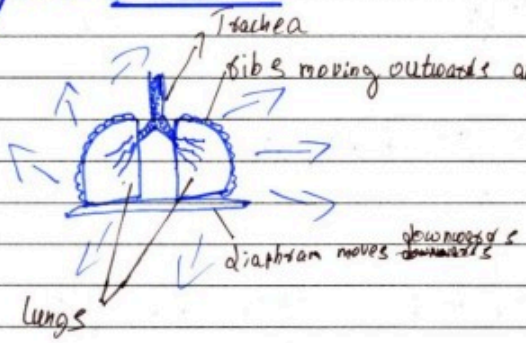
ii) **Relaxation of intercostal muscles**: The intercostal muscles relax, this

Q. No. 4 (Page 2) pulls the ribs inwards and downwards.

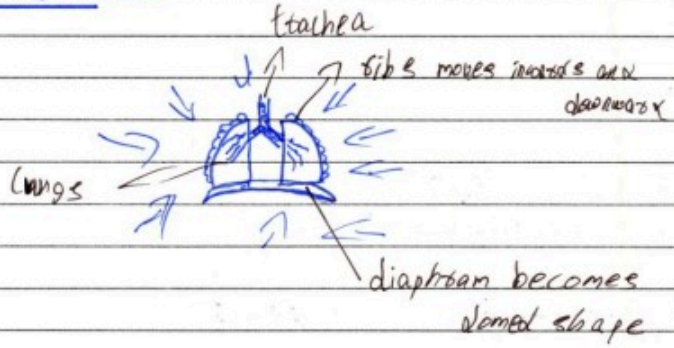
iii) The lungs ~~Expand~~ compresses. The volume decreases and pressure increases.

iv) Air is moved out of the lungs.

Diagram: Inhalation



Exhalation:



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

The stomach is the dilated part of the digestive tube.

Location:

It is roughly J-shaped and somewhat transversely placed at the left of abdomen, just beneath the diaphram.

Structure:

The stomach consists of two main openings:

i) **Cardiac opening:**

The opening between oesophagus and stomach is known as cardiac opening. It is guarded by muscles called cardiac sphincter.

- Cardiac end: The region around the cardiac opening is called cardiac end.

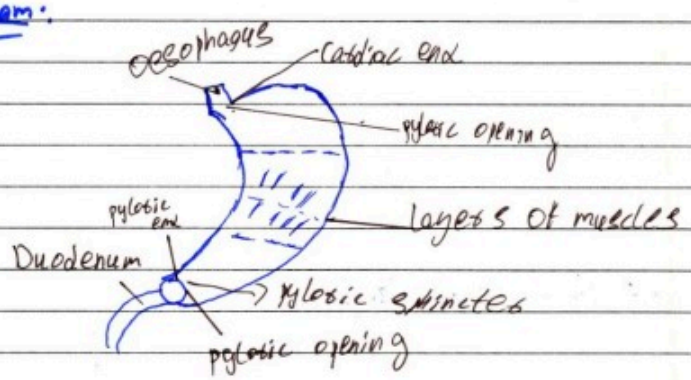
ii) **Pylorie opening:**

The opening between the stomach and duodenum is known as pylorie opening.

It is guarded by muscles called pylorie sphincter.

Q. No. 5 (Page 2) **Function:** The stomach plays an important role in digestion. Digestion in stomach leads food to become a soupy mixture called chyme. The stomach contains gastric glands which release gastric juice and gastric juice secretes HCL, pepsin and renin.

Diagram:



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

Dialysis is a process in which wastes and exces water is removed from the body. All the nitrogenous wastes are filtered or removed from the blood.

It has two types:

- **~~Renal~~ Peritoneal dialysis:**

1) In this process, dialysis fluid is added to the peritoneal cavity which is the space around the gut.
2) In it, peritonium ~~acts~~ which lines the peritoneal cavity acts as the dialysis membrane.
3) The dialysis fluid is added to abdominal cavity, and left for several hours before exchange of fluids.
4) Exchange of fluids takes place in between dialysis fluid and tissue fluid.
5) This is how peritoneal dialysis works.
6) It can be performed at home.
7) It must be done in 3-4 times in a day.

- **Haemodialysis:**

1) In this process, first a catheter is inserted into the vein of patient's arm.

Q. No. 6 (Page 2)

2. Then the blood travels through a tube into a machine called dialyzer.
3. Inside the machine, the blood is pumped onto the surface of membrane. (semi-permeable membrane)
4. It separates the blood from the dialysis fluid.
5. 'Used' is 'diffused' out of the blood into the dialysis fluid.
6. The dialysis fluid has already sugar and salts in it.
7. So, the salts and sugar in blood doesn't diffuse out.
8. Urea and wastes are excreted from the blood.
9. And the fresh blood is moved into the other vein of arm which is joined through a second cathether.
10. The used blood with wastes is directed outside of the machine and new blood enters the machine from other side.

This is how haemodialysis takes place.