



परीक्षार्थियों के लिए आवश्यक निर्देश

1. समस्त प्रश्नों का हल निर्धारित शब्द सीमा में इसी उत्तर पुस्तिका में करना है। विशेष परिस्थिति में अतिरिक्त उत्तर पुस्तिका से उत्तर पुस्तिका भरी हुई होने पर पर्यवेक्षक एवं वीक्षक की अनुशंसा पर ही उपलब्ध कराई जायेगी।
2. प्रश्न-पत्र पर निर्धारित स्थान पर अपना नामांक लिखें।
3. प्रश्न-पत्र हल करने के पश्चात् जिस पृष्ठ पर हल समाप्त होता है, उस पर अन्त में "समाप्त" लिखकर अन्त सभी रिक्त पृष्ठों को तिरछी लाईन से काटें।
4. निम्न बातों का विशेष ध्यान रखें अन्यथा अनुचित साधनों की रोकथाम अधिनियम के तहत कार्यवाही की जा सकेगी।
 - (i) उत्तर पुस्तिका के ऊपर/अन्दर तथा प्रश्नोत्तर के किसी भी भाग में चाही गई सूचना के अलावा अपना नाम, पता, फोन नम्बर अथवा पहचान की कोई अन्य प्रकार की सूचना आदि अंकित नहीं करें अन्यथा "अनुचित साधनों के प्रयोग" के अन्तर्गत कार्यवाही की जावेगी।
 - (ii) उत्तर पुस्तिका के पृष्ठों को फाड़ें नहीं। उत्तर-पुस्तिका के मुख पृष्ठ पर अंकित संख्या के अनुसार पृष्ठ होने चाहिये। परीक्षार्थी उत्तरपुस्तिका प्राप्त करते ही पृष्ठ संख्या की जांच कर लें यदि पृष्ठ कम/अधिक क्रम में नहीं हैं तो वीक्षक से तुरन्त बदलवा लें।
 - (iii) परीक्षा केन्द्रों पर पुस्तक, लेख, कागज, केलक्यूलेटर, मोबाईल, पेजर आदि किसी भी प्रकार का इलेक्ट्रॉनिक उपकरण तथा किसी भी प्रकार का हथियार आदि ले जाना निषेध है।
 - (iv) वस्त्र, स्कैल, ज्यामेट्री बॉक्स पर कुछ न लिखकर लावें। टेबुल के आस-पास कोई अवैध सामग्री नहीं लायें। चाहिये, इसकी जांच कर लें।
 - (v) अपनी उत्तर पुस्तिका/ग्राफ/मानचित्र आदि परीक्षा भवन से बाहर ले जाना दण्डनीय अपराध है, अतः परीक्षा समाप्ति पर उत्तर पुस्तिका वीक्षक को बिना सौंपे परीक्षा कक्ष नहीं छोड़ें।
5. उत्तरों को क्रमानुसार एक ही स्थान पर लिखें। प्रश्न क्रमांक भी सही अंकित करें, अन्यथा दण्ड स्वरूप परीक्षक को 1 अंक कम करने का अधिकार है। बीच में उत्तर पुस्तिका के पृष्ठ रिक्त न छोड़ें। गणित विषय के लिए रफ उत्तर पुस्तिका के अंतिम पृष्ठों पर करें तथा तिरछी रेखा से काटें।
6. जहाँ तक हो सके प्रश्न के सभी भाग के उत्तर, उत्तर पुस्तिका में एक ही स्थान पर अंकित करें।
7. भाषा विषयों को छोड़कर शेष सभी विषयों के प्रश्न-पत्र हिन्दी-अंग्रेजी दोनों भाषा में मुद्रित है। किसी भी प्रकार की त्रुटि/अन्तर/विरोधाभास होने पर हिन्दी भाषा के प्रश्न को ही सही माना जाये।



Ans) Agamospermy means without fertilisation. It is defined as the process of formation of seed without the involvement of fusion of male and female gametes.

Ans) Deficiency of element ~~Calcium~~ ^{Chlorine} in the soil which causes Dieback diseases of lemon is Chlorine. (cl)

Ans) The class of enzyme which catalyze the oxidation and reduction reactions is ~~oxidoreductase~~ ^{oxidoreductase}.
For ex- Reductase, Oxidatase \rightarrow Oxireductase.

Ans) By NAA (Naphthalin acetic acid) is used to store potato tubers. The plant hormone is Auxin.

Ans) In Recombinant DNA technology, we use polymerase chain reaction by which we make lots of copies of DNA from a single copy in very limited time.

Ans) Biogas is defined as the energy rich gas which produce by organic waste material such as cow dung etc which produce high amount of gas rich energy and gas produced is Methane which good source of fuel.



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Ans 7) Platelets and also reuptaking of RBC active cofactors which are necessarily for starting the process of blood clotting.

Ans 8) At the Blind spot, there is no rod cells & no cone cells are found.

Ans 9) Adrenaline Hormone prepares the human body to face adverse conditions.

Ans 10) In human, the first cervical vertebra called atlas.

Ans 11) Implantation is defined as the process in which the Blastomere attached with the uterine wall i.e. endometrium. This process of attachment of Blastocyst on the endometrium wall of uterus termed as Implantation.

Ans 12) The measurement of Haemoglobin present in the blood is called Haemoglobinometry and device used in this, is called Haemoglobinometer.

Ans 13) The full form of MRI is Magnetic Resonance Imaging.



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Ans 14) OR

(i) Water potential (Ψ_w) is equal to the sum of osmotic potential (Ψ_s) and Pressure potential (Ψ_p)

$$\Psi_w = \Psi_s + \Psi_p$$

(ii) Water potential (Ψ_w) = osmotic potential (Ψ_s) and water Pressure potential (Ψ_p)

$$\Psi_w = \Psi_s + \Psi_p$$

$$\Psi_w = -35 + (-5)$$

$$\Psi_w = -35 - 5 = -40$$

The water potential of solution is -40 atm

Ans 15) (i) The critical element present in soil is N (Nitrogen), K (potassium) and Phosphorous (P). For this NPK fertilizer is available which give adequate amount of this to plant.

(ii) Deficiency symptoms appear first in apical buds, elements are ^{Sulphur} Nitrogen, Boron, Fluorine, chlorine, Sodium

Ans 16) A Bacteriophage is more important vector in comparison to M13 because of the following reasons

(i) Firstly, it is EcoLi.

(ii) In this, we removed unwanted gene or



DNA by which we attach our more length of desired DNA in it.

(iii) It has ~~we~~ plaque area that makes experiment easier.

(iv) It has more no. of restriction site and have ~~remark~~ and reporter gene.

Q17) Agrobacterium mediated gene transfer:-

In this gene transfer, in Agrobacterium, there is a gene which induces tumour and is called Ti gene which is T is for tumour and i for inducing.

In this, the DNA template which is have this gene and complementary to the other template is called Ccc DNA. In this, Agrobacterium is grown with the crop in antibiotic free medium and Agrobacterium infect the crop which started at apical of crop plant, by this we get transgenic plant. This process of gene transfer is called Agrobacterium mediated gene transfer. In this Agrobacterium is mediated to crop plant which help in increase of production of yield.

Q18) Match

(A) Groundnut - ~~dry flower~~ and seed

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- [B] Coconut - Endosperm. ✓
[C] Clove - Seed dried flower bud. ✓
[D] Turmeric - dried Rhizomes. ✓

Ans) Bluegreen algae or cyanobacteria works as biofertilizer because in Bluegreen algae or cyanobacteria, there is a special cell is found which named as "Heterocyst." In this special gene "nif gene" is present which fixes the atmospheric nitrogen and help in nitrogen fixation in the soil. From the soil, plant takes Nitrogen in the form of NO_3^- and NO_2^- mainly in form of NO_3^- (Nitrate ion). By which nitrogen requirement is done to plant and also increase fertility of soil. So, this work as biofertilizer.

Ans) Two respiratory disorders are as the following:-

(i) Bronchitis :-

In this respiratory disease, the inflammation is occurred in the Bronchus which makes hard Breathing. In this disease, in lungs, fluid is filled which also due to coughing and cold.

By taking, precaution and using medicine we prevents and make body free from this.

(ii) Asthma :-



It is respiratory disease, in which some particles such as pollen grain etc. induces coughing and sneezing in the person, it due to allergic nature. The allergic substances occur continuously sneezing and coughing. Person saves themself from away from the causative agents.

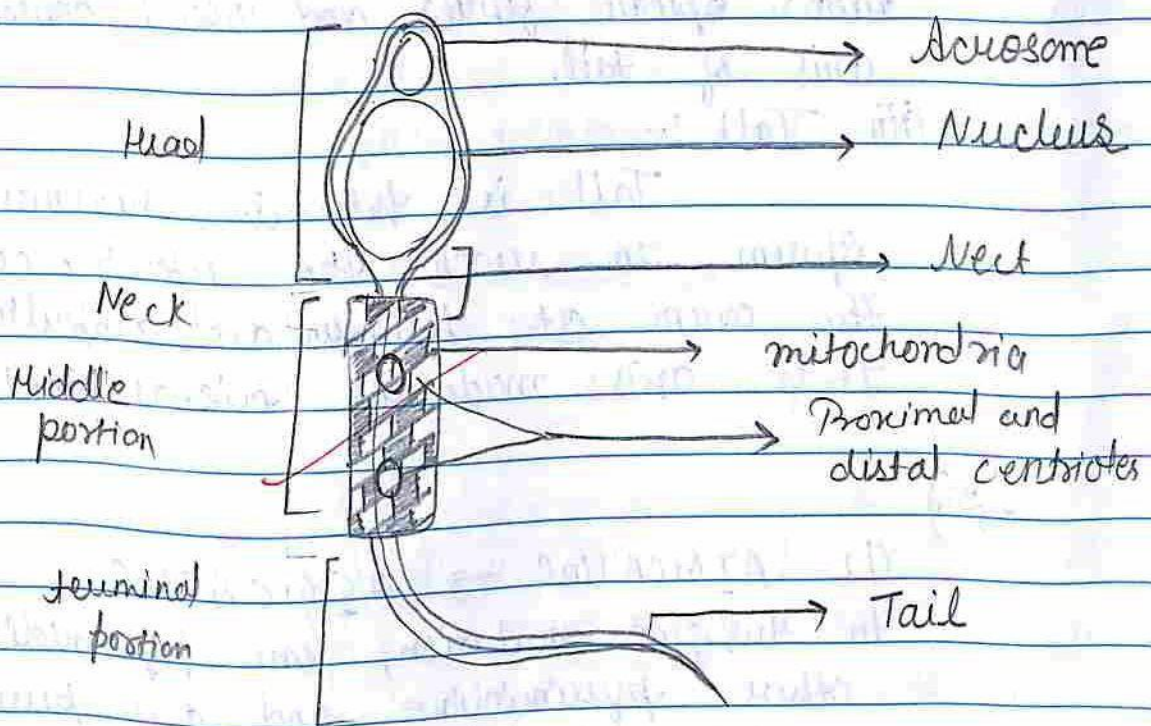
Q.21) The hormone is FSH (follicle stimulating hormone) and LH (luteinizing hormone) help in the induces the development of corpus luteum. The development of corpus luteum is from LH hormone.

The effect produced due to the damage of corpus luteum is as following:

- (1) By damaging of corpus luteum, there is decrease in estrogen and Progesterone hormone.
- (2) There is sudden fall in these two hormones, there is shed off the endometrium wall of uterus.
- (3) The endometrium shed off in the form of blood, mucus etc.
- (4) There is no environment made for the fertilisation and implantation process in uterus.



Q.99)



Human sperm

Structure of Human sperm:-

A human sperm consists of the following parts :-

(i) Head :-

Head portion, an acrosome is found which helps in penetrating the wall of ~~ovules~~ ovum or egg. In this, hyaluronidase enzyme and lysin enzyme is present help in penetrating and fertilisation process. There is an oval, nucleus in it which fuses with ovum nucleus.

(ii) Neck :-

In the neck portion, there is a mitochondrion provide energy to sperm for their movement and to survive. There are two centrioles found which



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Proximal and Distal centriole. Proximal centrioles makes spindle fibres and Distal centrioles makes axis of tail.

(iii) Tail :-

Tail is help in movement of sperm to reach the uterine cavity to the ovum at Isthmus and ampulla junction. It's axis made by distal centrioles.

Q23)

(i) $ATGCATGC \rightarrow ACGCATGC$

In this gene mutation, one pyrimidine replace other pyrimidine, and one purine is replaced by other purine.

→ This gene mutation is Translocation

(ii) $ATGCATGC \rightarrow ATGAATGC$

In this, one pyrimidine is replaced by purine and purine replaced by pyrimidine

→ In this gene mutation is Inverted

Q24)

The causative agent of Amoebic dysentery is *Entamoeba histolytica*.

Two symptoms:

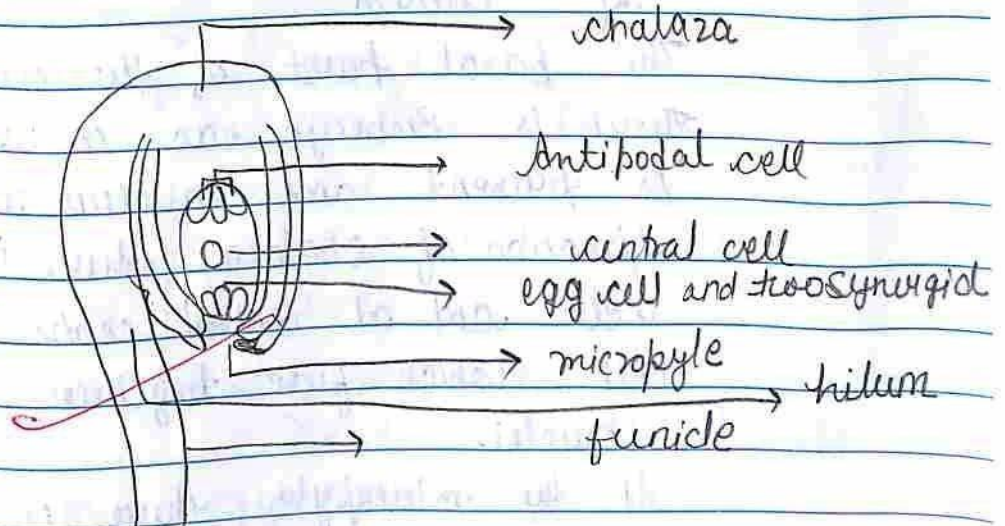
- (1) Ulcer in Stomach
- (2) Stomach pain and weakness, Vomiting etc



Two preventive measures

- (1) We should not eat stale and contaminated food. we use fresh food.
- (2) Use of ~~green~~ green vegetable more and increase liquid meal.

Ans)



Structure of Anatropous Ovule :-

In a anatropous ovule, it is complex ovule. In this, the basal cell of this ovule ~~part~~ provide nutrition to embryo sac which is called nucellus.

The ovule covered by the protective wall or membrane which is called as integuments. It may be unitemic (have one integument which surround the embryo sac.) It is may be bitemic which means two integuments covered the embryo sac. and it may be atemic i.e. there is no integuments.

There is a funnel shaped structure which called funicle. By funicle it attached with ovary.

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Hilum is place where funicle joint the ovule integuments. There is a integument which surrounds the embryo sac not completely and at this point, it is called micropyle. Micropyle is opposite direction of chalaza.

The basal part of the ovule is chalaza. There is embryo sac in which 7 cell is present and nucleus is of 8n. At the direction of chalaza, there is three antipodal cell and at central centre, there is two cell which fuse together to make polar nuclei.

At the micropyle, there is an egg cell and two synergid is present in which pollen tube enters.

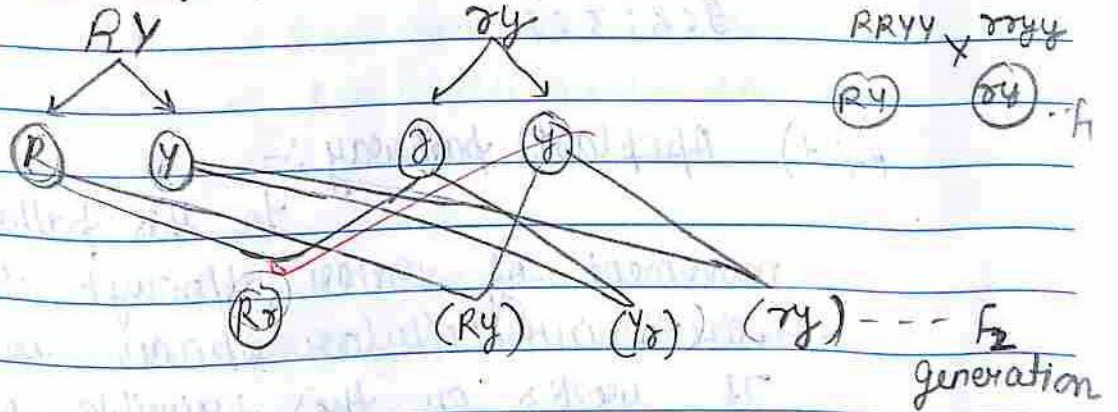
Q26) Dihybrid cross:-

In this, cross Mendel's cross with two different alleles in F₁ generation and at again cross F₁ generation on allele itself. This cross is called Dihybrid cross. In this cross, there is two different alleles so, the hybrid cross is called Dihybrid cross.

Mendel cross

Round and Green (seed)

wrinkled and Yellow / seed.



♀ \ ♂	Rr	Ry	Yr	ry
Rr	RRrr	RRYy	RrRr	Rryy
Ry	RRYr	RRyy	RrYy	Rryy
Yr	RrRr	RrYy	YYrr	Yyrr
ry	Rryy	Rryy	rrYy	rryy

In this

the genotypic ratio is 9:3:3:1
 phenotypic ratio is 1:2:2:1:2:3:1:2:1

In this, Mendel cross, round and yellow pea seed with wrinkled and yellow pea seed. This cross is called dihybrid cross. In the first cross RRYY and rryy made F₁ generation and by F₁ green



F₂ crossing itself made which is called ~~cross~~ dihybrid cross. In this genotype ratio is 9:3:3:1

Q27) Apoplast pathway :-

In this pathway, there is movement of water through the cell membrane or intercellular spaces between them. It works on the principle of diffusion through intercellular places and also osmosis through cell membrane.

It is ~~passive~~ pathway. There is no need of energy is required in it. It is a simple process occurs in plant cell. Casparian strips are also found in the endodermal cell of the roots. It has wax and suberine deposition by which it is impermeable in ~~root~~ nature towards the water molecules, so, this osmosis occurs through the cell membrane of cell and movement of water occurs. It is transverse pathway.

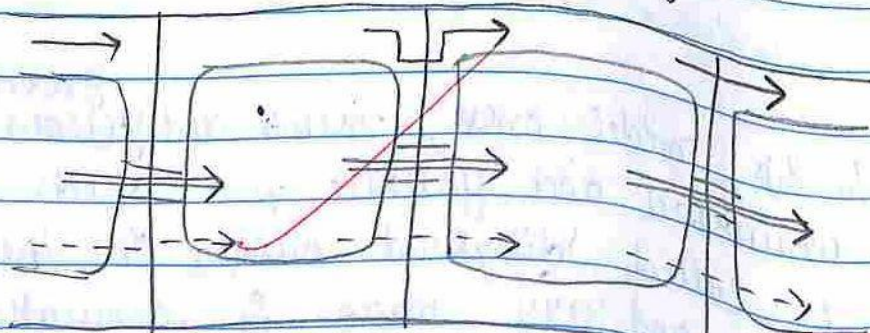


Diagram showing different pathway



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where,

→ = ~~is~~ Apoplast pathway

---→ = Symplast pathway

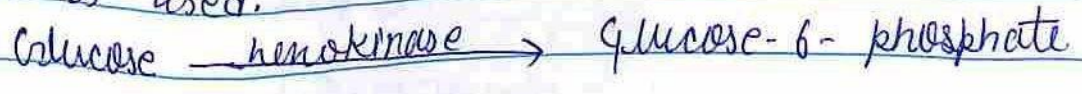
⇒ vacuolar pathway.

Ans)

(i) The site of glycolysis is cytoplasm.

(ii) The various step of phosphorylation of glucose in glycolysis are as following:-

(a) Glucose is phosphorylated. In this, Glucose is converted into Glucose-6-phosphate by the help of enzyme hexokinase. In this ATP is used.



(b) In second step, Glucose-6-phosphate is converted into fructose by the help of enzyme Fructose



(c) In third step, fructose is converted into Fructose 6-phosphate into 6 carbon Fructose 1,6-phosphate with the help phosphoribomerase enzyme.



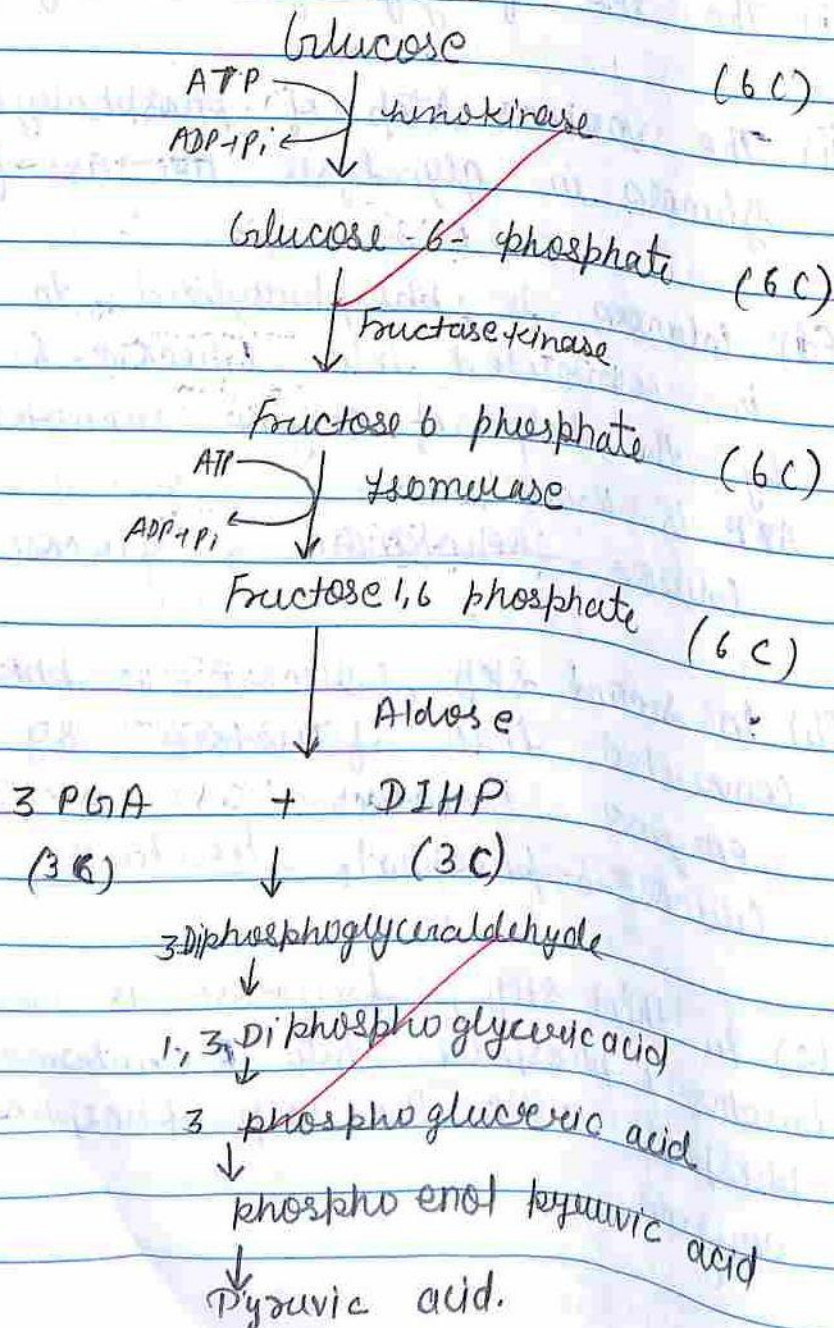
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(d) In the fourth step, Fructose 1,6 phosphate is split into 3 molecules of phosphoglyceraldes. Fructose 1-6 phosphate $\xrightarrow{\text{aldolase}}$ 3PGA + DIHP

(iii) line diagram of phosphorylation of glucose

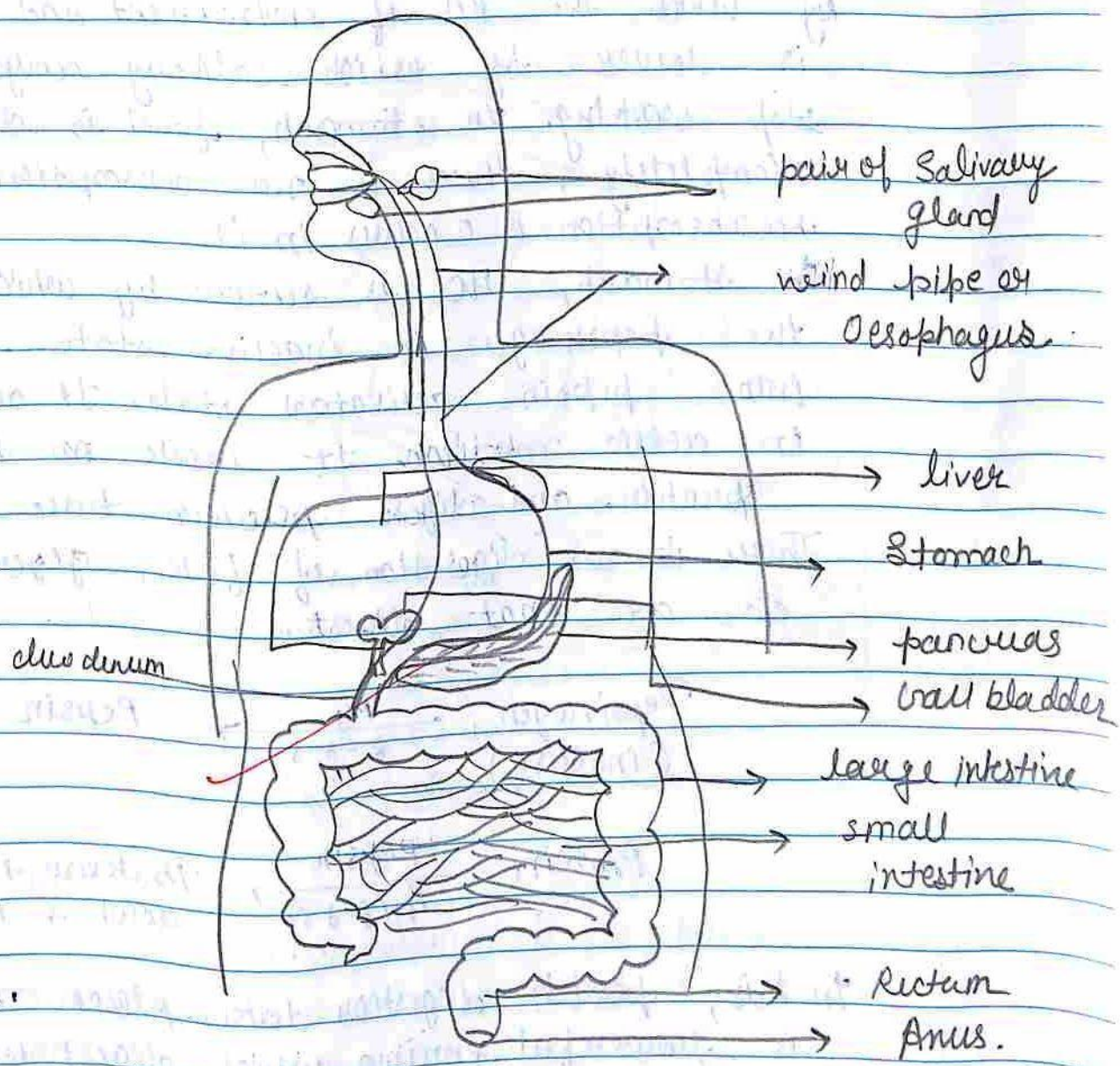




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Q29)



∴ Human digestive system ∴

Mechanism of digestion in stomach :-

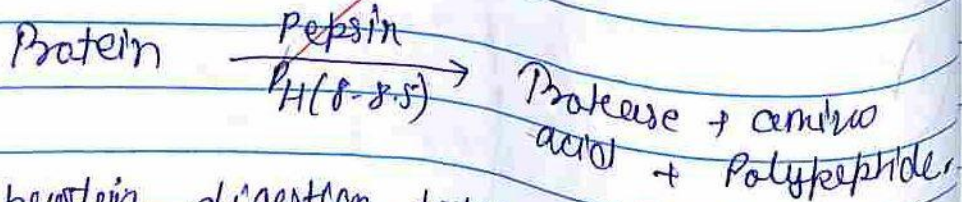
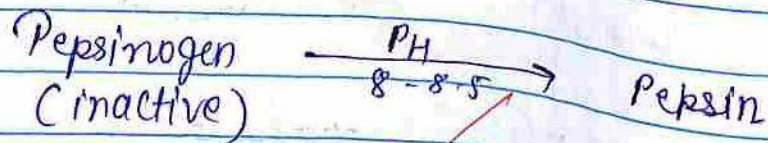
In the stomach partial digest food from mouth through oesophagus comes in stomach. The stomach wall has gastric gland and secretes gastric juices and secretes Hydrochloric acid

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by which the pH of environment and food is lower by which salivary amylase stop working. In stomach, food is digest incompletely, there is no absorption and reabsorption is occurs in it.

In stomach, HCl is secrete by which the pepsinogen in inactive state converted into pepsin activated state. It activates in acidic medium. It work on the protein. and digest protein here only. There is no digestion of fat, glycerol etc are not digest.

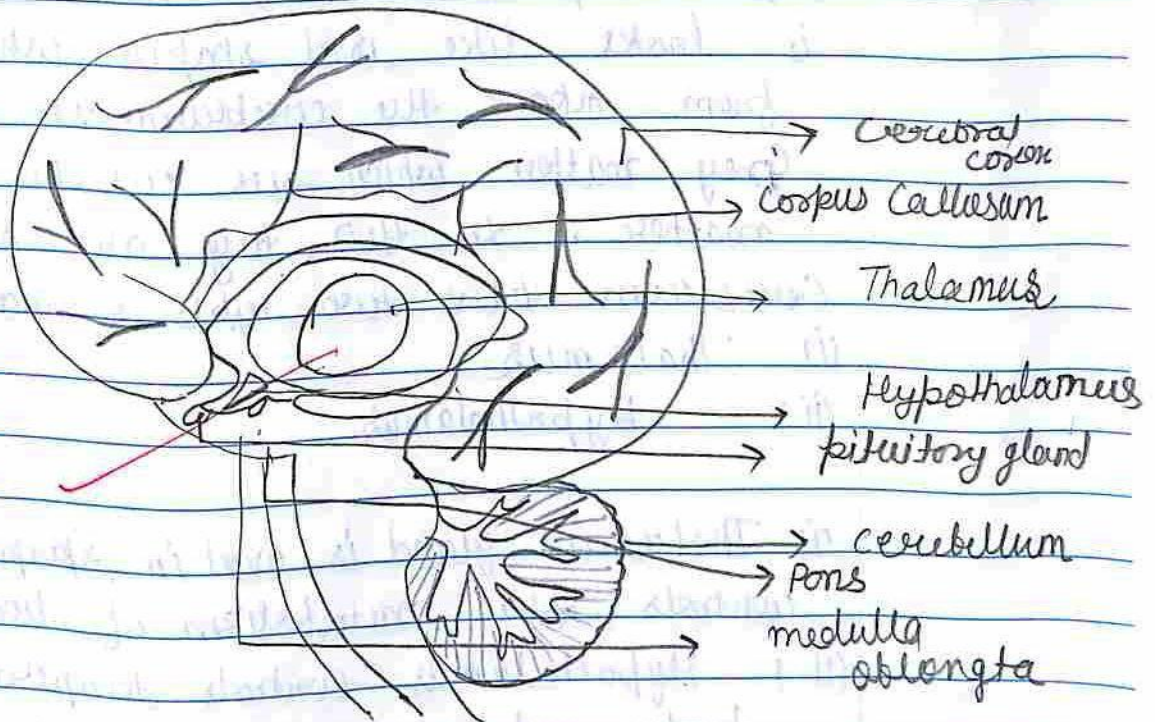


In this, protein digestion takes place. This is powerful enzyme which digest protein in very short time.

Renin is a proteolytic enzyme. which digest the milk, but it human, it is absent or is not present. This present in infants only. There is partial digestion of glucose, fatty oil, glycerol etc.

Q.30)

(i)

Human brain(ii) Cerebrum :-

Cerebrum is a biggest part. It consists of two hemispheres. The Right hemisphere and left hemisphere. The Right and left hemisphere is separated by the a membrane and these are attached by the membrane named Corpus Callosum.

The Right hemisphere of cerebrum controls the left part of the body and left Hemisphere controls the right part of the body. It is a centre of many functions.



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The cerebrum have nerve cells and many blood capillaries on its inner wall. It is looks like oval shaped when look from above the cerebrum. It have Grey matter which sees outside and white matter. In this they are sees invertebrate Cerebellum have two types of gland in

- (i) Thalamus
- (ii) Hypothalamus.

(i) Thalamus gland is oval in shaped and controls the metabolism of body.

(ii) Hypothalamus controls temperature of the body and memorizing, blood pressure etc and are present near below the Thalamus and cerebrum Callosum respectively.

(iii) Two function of cerebrum

- (i) It helps in memorizing, planning etc.
- (ii) It help sneezing, coughing and many metabolism process.

Ans 2) ~~CU~~