



NEB Grade 12 Biology Model Paper Solution

sajhanotes | March 19, 2022

Home » NEB Grade 12 Paper » NEB Grade 12 Biology Model Paper Solution

×

NEB Grade 12 Biology Model Paper Solution of New syllabus 2078.

Check out [NEB Grade 12 Biology Model Paper Solution of new curriculum/syllabus 2078](#). Download NEB grade 12/XII Biology model question [paper of new syllabus 2078](#). Also, check out our [chemistry notes here](#).

PART: I [BOTANY]

Group A (5 x 1 = 5)

Circle the correct answer from the given alternatives.

1. There are many types of chromosomal disorders in organisms, among them euploidy is very common in the population. Which one of the following conditions is true for euploidy?

a. Addition or deletion of one or more chromosome in diploid chromosome

a. Addition or deletion of one or more chromosome in diploid chromosome

b. Addition of one or more chromosome in diploid chromosome

c. Deletion of one or more chromosome in diploid chromosome

d. Addition or deletion of one set or more than one set of chromosomes in diploid chromosome.

Ans: D is the correct ans.

2. The formation of two male gametes is a peculiar feature in angiosperm. If the first male gamete is fused to oosphere, in which part does the second male gamete fuse?

a. Synergids

b. Egg cell

c. Polar nuclei

d. Antipodal cell

Ans: C is the correct ans.

3. The given vascular bundle is highly specialised by centripetal protoxylem. What is it called?

a. Exarch

b. Endarch

c. Mesarch

d. Centrarch

Ans: A is the correct ans.



4. Which of the following plants is used as bio fertilizer?

a. Ko/vox

b. Funaria

c. Azolla

d. Rhizopus

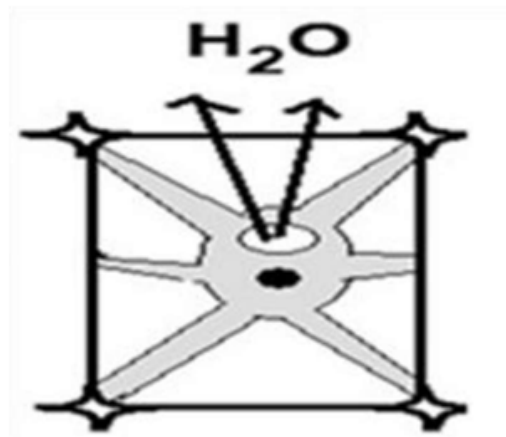
Ans: C is the correct ans.

5. When a plant cell is placed in hypertonic solution, it gets plasmolysed as shown in the diagram. Which of the following occupies the space between the cell wall and the

diagram. Which of the following occupies the space between the cell wall and the shrunken protoplast in such plasmolysed cell?

- a. Water
- b. Hypertonic solution
- c. Isotonic solution
- d. Hypotonic solution

Ans: B is the correct ans.



Group B (4 x 4 = 16)

Give short answers to the following questions.

1. The anatomical structure of the vascular plant is given. Study the given diagram and answer the following questions. (1+3=4)

- (a) Write the main characteristics of the given layer Y.
- (b) Draw the given diagram and label the tissues which is responsible for secondary growth. Elaborate the activities of this tissue up to the formation of the cambial ring.

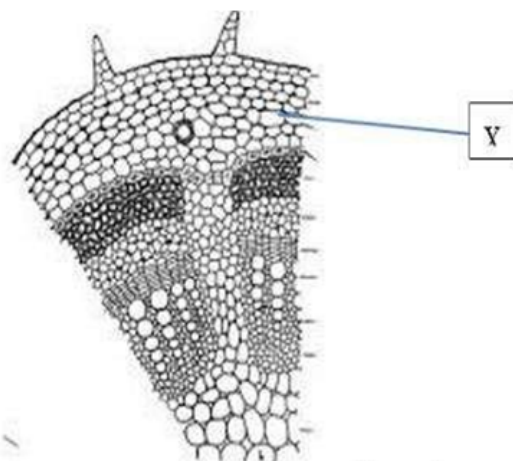
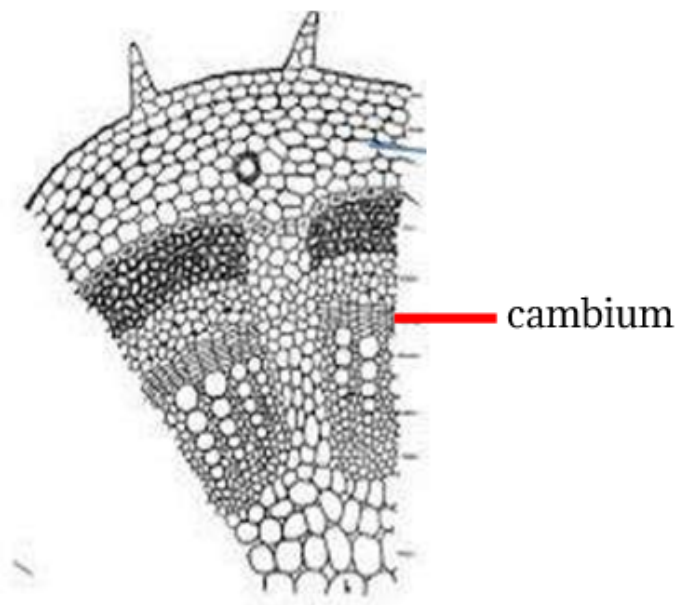


Figure -I

- a. The given layer Y is the cortex and its main functions are diffusing water, nutrients and

other substance into the inner vascular structures and storing starch.

b.



Cambium is responsible for secondary growth.

The cambium is present between the primary xylem and primary phloem which is called intrafascicular cambium. The cells of medullary rays near these intrafascicular cambia become meristematic and form interfascicular cambium. This leads to the formation of a continuous ring of cambium.

2. Write the salient features of a monocot embryo in reference to its development pattern with diagrams. (3+1=4)

Ans: Monocot embryo is a rudimentary stage of monocots that can develop into a new individual.

The salient features of a monocot embryo are as follow:

- ✓ • It is a rudimentary stage of a monocot.
- It consists of one cotyledon.
- a single monocot cotyledon occurs at the terminal position.
- plumule occurs laterally.

- Cotyledon resembles the true leaves.
- Envelope of the plumule is called coleoptile.

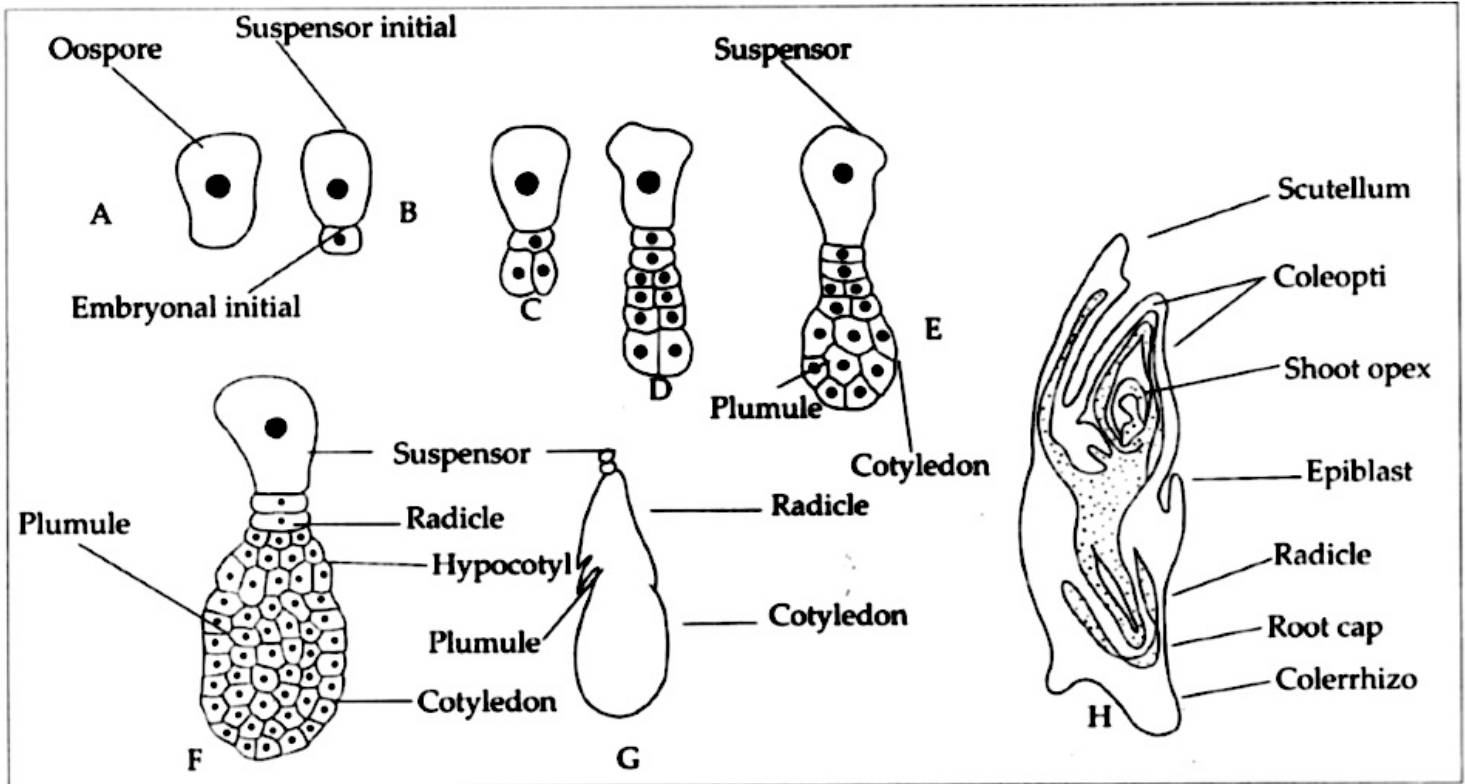


Fig. 1.13: Development of monocot embryo

Source: snapsolve.com

3. "Micropropagation is an analytical and conventional bulk breeding technique for rapid cloning of desirable stock". Justify the statement by describing it briefly with the various stages of the micropropagation technique in plants. (4)

Ans: This statement states that micropropagation helps in the propagation of a large number of plants in a short span of time. It leads to the production of healthier plantlets, which exhibit better disease-resisting powers.

The power of micropropagation can be divided into four stages:

a. Initiation stage: A piece of plant tissue (called an explant) is a. cut from the plant, b. disinfected (removal of surface contaminants), and c. placed on a medium. The objective of this stage is to achieve an aseptic culture. An aseptic culture is one without contaminating bacteria or fungi.

✓

b. Multiplication stage: A growing explant can be induced to produce vegetative shoots by including a cytokinin in the medium.

c. Rooting or preplant stage: Growing shoots can be induced to produce adventitious roots by including an auxin in the medium. Auxins are plant growth regulators that promote root formation.

d. Acclimatization: A growing, rooted shoot can be removed from tissue culture and placed in soil. When this is done, the humidity must be gradually reduced over time because tissue-cultured plants are extremely susceptible to sitting.

4. What is genetic material? Describe the structure and functions of RNA. (1+2+1=4)

Ans: The substance which stores biological information in a coded form, transfers it to the next generation and cause its expression in the offspring is called genetic material.

The structure of RNA is that it is a single-stranded biopolymer. However, the presence of self-complementary sequences in the RNA strand leads to interchain base pairing and folding of the ribonucleotide chain into complex structural forms consisting of bulges and helices. The three-dimensional structure of RNA is critical to its stability and function allowing the ribose sugar and the nitrogenous bases to be modified in numerous different ways by cellular enzymes that attach chemical groups. Ex: Methyl group to the chain.

The function of RNA is:

- mRNA (messenger): Instruction of protein
- tRNA (transfer): Carriers that match amino acids to codons during translation.
- rRNA (ribosomal): part of the ribosomes- Ribosomes are RNA plus protein.

OR

What are plant growth hormones? Write the physiological functions of auxin. Mention its shortcoming of hyper use in crops.

Ans: Plants need sunlight, water, oxygen, minerals for their growth and development. These are external factors. Apart from these, there are some intrinsic factors that regulate the growth and development of plants. These are called plant growth hormones or 'Photohormones.'

The physiological functions of auxin are as follow:

- ✓ cell elongation: Auxin elongates the cell at the region of the shoot and root tip behind the apical meristem.
- Root formation: Auxin promotes root formation in cutting ends of shoots.
- Flowering: NAA and 2,4-D are often used to induce flowering in litchi and pineapple.

- Apical dominance: It is a phenomenon by which the presence of apical bud does not allow nearby lateral buds to grow.

Its shortcoming of hyper use in crops are:

- Lateral growth of bud is suppressed.
- The growth of the root tip is retarded.
- Consequently resulting in the death of the plants.

GROUP 'C' (2 x 8 = 16)

Give long answers to the following questions.

5. One of the Mendelian inheritances states that 'The alleles of different traits can be segregated during gametogenesis and passed independently'. State and explain the essential pattern of inheritance verifying the statement with examples showing cross up to second filial generation with chart and ratio. (1+ 3+2+2= 8)

Ans: Law of segregation states that F1 hybrids are always heterozygous and when the time of gametogenesis comes, the factors of each character segregate so that each gamete receives only one factor of each character. Thus, the gametes formed are always pure. So, this law is also known as the law of purity of gametes. Example:

Monohybrid cross

P Phenotype Tall x Dwarf
 Genotype TT tt
 Homozygous dominant Homozygous recessive

F_1 Tt
 All Tall Tall is dominant to Dwarf

Self pollinated Heterozygous

F_2	Gametes	T	t
	T	TT tall	Tt tall
	t	Tt Tall	tt Dwarf

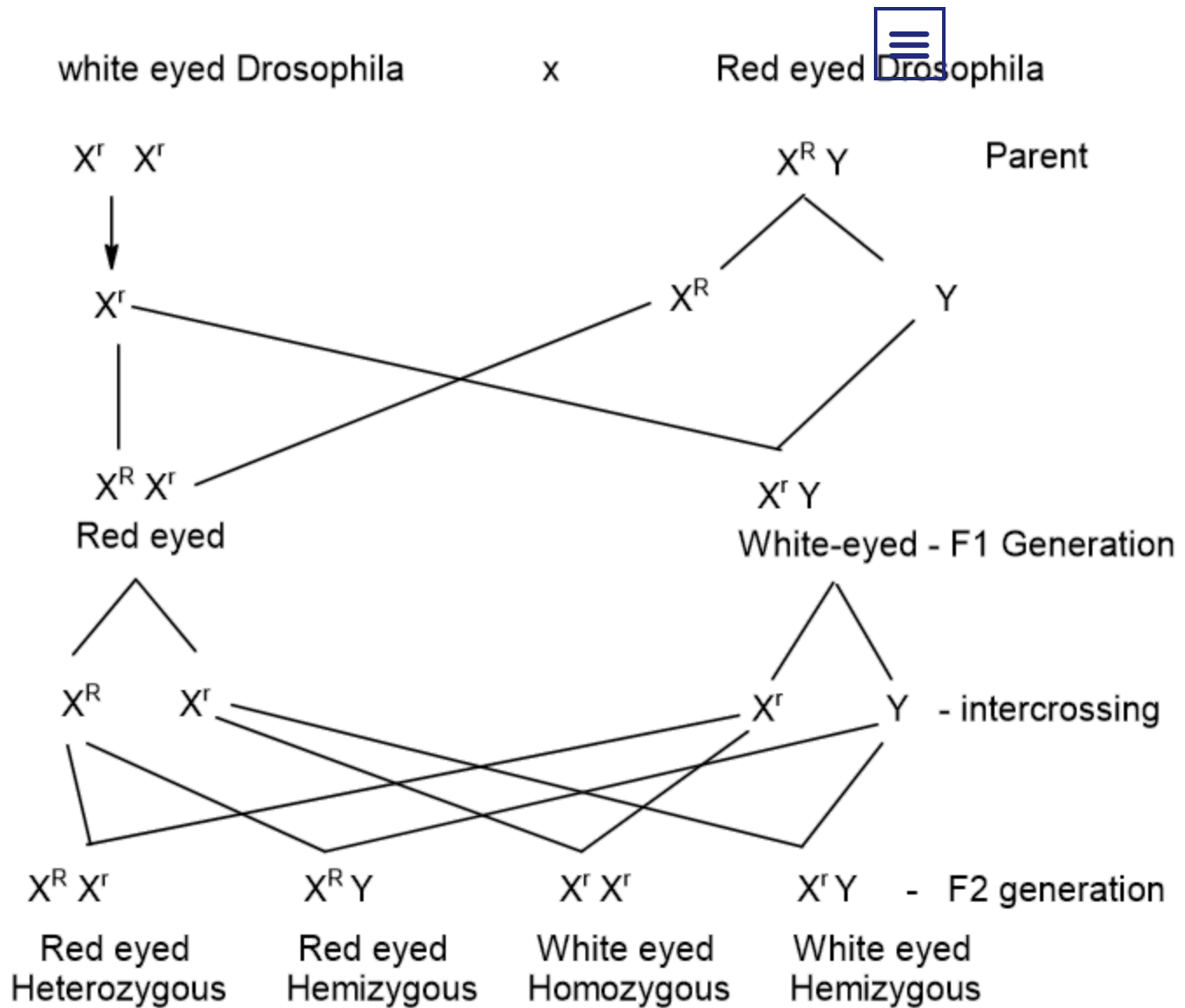
Phenotypic ratio: 3:1

Genotypic ratio: 1 : 2 : 1

OR

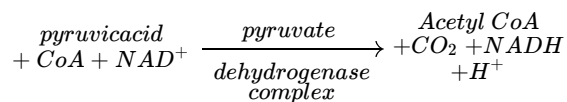
In Drosophila, an eye colour is X-linked. Explain. If white eye female Drosophila is crossed to red-eye male Drosophila, what result do you expect? Analyse briefly with the help of crosses.

Ans: When white eye female Drosophila is crossed to red-eye Male Drosophila, all Male progenies obtained were white-eyed but females were red-eyed in the F_1 generation. Again, when red-eyed female Drosophila and white-eyed male Drosophila of F_1 generation were intercrossed, it is observed that in the F_2 generation, Drosophilas obtained were in the ratio of 1 heterozygous red-eyed female, 2 homozygous white-eyed male, 1 hemizygous red-eyed male and 1 hemizygous white-eyed male i.e. 1:2:1:1



6. How are the Glycolysis and Krebs (TCA) cycles linked? Draw a detailed flow chart of the Krebs cycle? (4+ 4= 8)

Ans: Glycolysis and Krebs (TCA) cycle are catalysed by the linking reaction catalysed by pyruvate dehydrogenase complex. Pyruvic acid produced at the end of glycolysis is transported to the matrix of mitochondria where it undergoes oxidative decarboxylation to produce acetyl CoA and Acetyl Co. A enters the TCA cycle. 2 molecules of pyruvic acid produced by the breakdown of a glucose molecule in glycolysis produce 2 molecules of acetyl CoA, carbon dioxide and NADH each in this reaction.



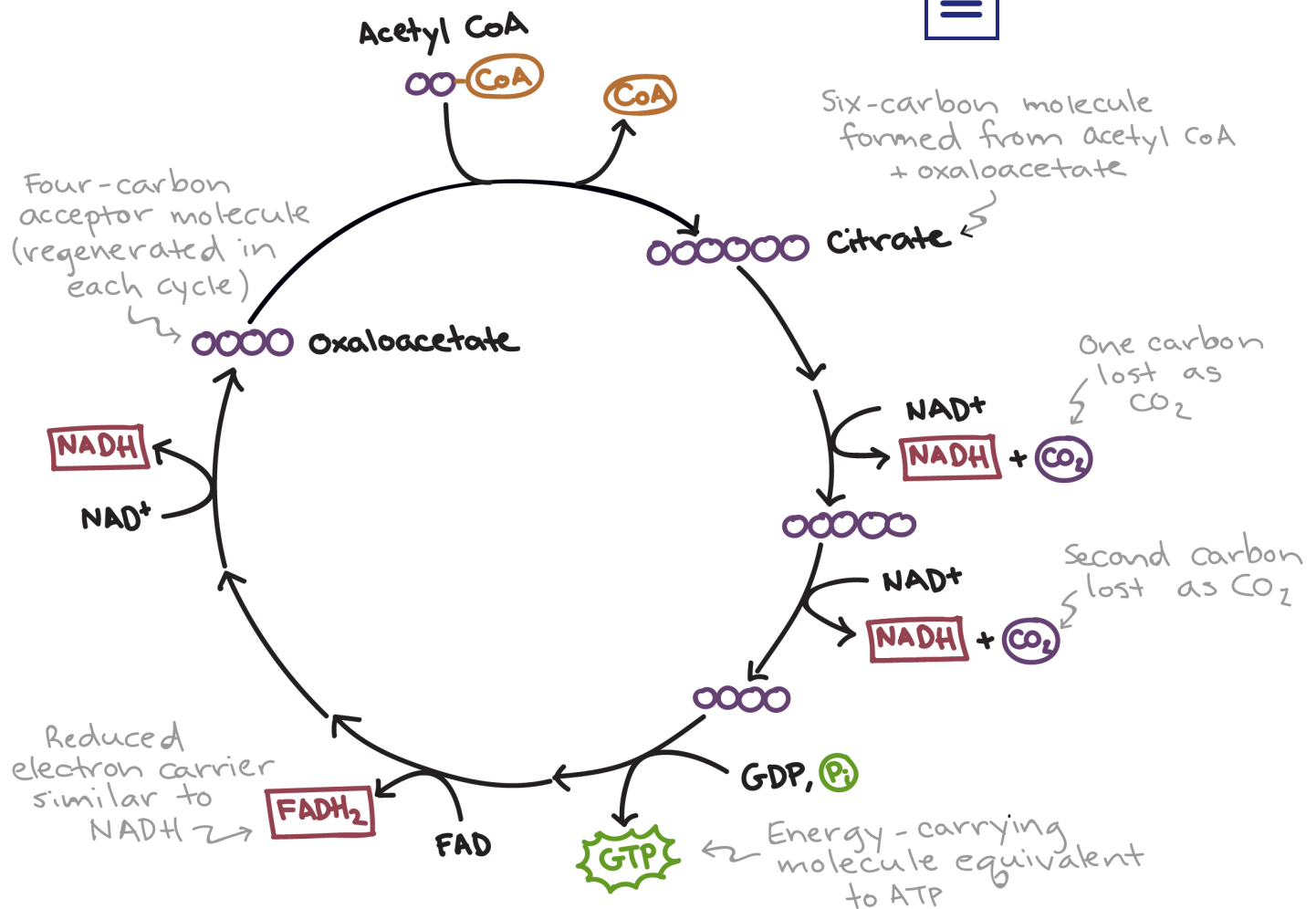


Fig: Kreb's Cycle (source: Khan Academy)

PART: II [Zoology]

Group 'A' (6 x 1 = 6)

Circle the correct answer from the given alternatives.

1. The parasympathetic nervous system releases a hormone acetylcholine. Which one of the following is activated by this hormone?

- a. Regulate the involuntary response
- b. Decrease the rate of heart beat
- c. Increase blood pressure
- d. Increase myocardial contractility.

Ans: B is the correct ans.

2. After the release of mature ovum from the ovary, the Graffian follicle changes into corpus luteum which is the source of female sex hormones. In the woman, what would be the condition of corpus luteum in absence of pregnancy?

condition of corpus luteum in absence of pregnancy:



- a. Secretes FSH and LH continuously
- b. Secretes oxytocin and relaxin
- c. Automatically degenerates after sometime
- d. Remains intact and active.

Ans: C is the correct ans.

3. Which of the following statement is more appropriate for early an amniocentesis test?

- a. It takes place between 15 and 20 weeks of pregnancy
- b. It may cause fetal injury and lethality
- c. It helps to detect fetal complications
- d. It may cause infertility.

Ans: A is the correct ans.

4. What are the main processes involved in gastrulation of a frog?

- a. Epiboly, involution, cleavage
- b. Epiboly, invagination, Involution
- c. Involution, epiboly, invagination
- d. Involution, invagination, cleavage.

Ans: B is the correct ans.

5. Blood cells are formed in the bone marrow. What is the process of formation of blood called?

- a. Haemopoiesis
- b. Haemolysis
- c. Lymphopoiesis
- d. Erythroblastosis.

Ans: A is the correct ans.



6. A person suddenly falls down and becomes unconscious. A doctor checked and said that it is due to inadequate blood supply to the brain. What would be the type of disorder?

- a. Asthma

b. Syncope

c. Heart attack

d. Oedema.

Ans: B is the correct ans.



Group 'B' (4 x 4 = 16)

Give short answers to the following questions.

1. Compare and contrast areolar tissue and adipose tissue. 2+2=4

Ans: The differences between areolar and adipose tissue are:

Areolar Tissue	Adipose Tissue
1. Consists of different types of cells such as fibroblasts, mast cells, macrophages and plasma cells.	1. Consists of a similar type of cell called adipocytes.
2. Made up of gelatinous matrix containing cells and irregularly arranged fibres.	2. Cells are filled with fat globules situated in a large central vacuole of a cell
3. Fills the space inside the organs and supports the internal organ.	3. Acts as fat reservoir and insulator of heat.
4. Helps in the repair of tissues.	4. Acts as a cushion and provides protection to the internal organs.
5. Loose connective tissue	5. Fatty connective tissue

2. Describe the process of fertilization of an egg with reference a frog. 4

Ans: The process of fusion of haploid male and female gametes to form diploid zygotes is called fertilization. In frogs, fertilization is external and takes place in water.





Fig: Fertilized egg

The female frog lays eggs in the form of secondary oocytes. During fertilization, many sperms enter into a single egg. After contact between sperm and egg, the acrosome of sperm breaks and lysin comes out. It helps to dissolve the egg membrane. A cone of reception appears in the animal hemisphere region of the egg. It receives single sperm. Sperm enters into the egg without its tail as the tail breaks. After this vitelline membrane changes into a fertilization membrane. It prevents the entry of other sperms. Thus, fertilization is monospermy. After this, the Meiosis-II division occurs in egg forming ovum nucleus and a polar body. Now, fusion takes place between the ovum nucleus and sperm nucleus forming a diploid zygote nucleus. There are 26 chromosomes in the zygote nucleus.

The side opposite to the sperm entry, a crescent-like structure appears just above the equator. It represents the future dorsal lip of the blastopore. After the formation of the zygote, cleavage starts.

OR

Describe the various steps applied in poultry farming. 4

Ans: The various steps applied in poultry farming are as follows:

1. Construction of poultry house: The ground of the shelter house should be dry with sandy floor with good amount of lime stones pebbles etc. The marshy, dirty and drained grounds are fatal to animals.
2. Selection of breeds: Selection of good breeds are essential such as best egg layers are Langshan, Sussex etc. Similarly, Ancona, Minorca are best egg layers for meat.

Langshan, Sussex etc. Similarly, Anova, Minorca are best egg layers for meat production. Cross breeds plymouth rock and white leghorn are best.

3. Food and feeding: The quality and quantity of balanced food materials are the backbone of chickens. The oats, peas, grams and beans are the food for fowls.

The diet recommended by indian veterinary research is given below:

Maize Meal	20 parts
Ground oat	20 parts
Wheat bran	40 parts
Earthnut meal	20 parts
Common salt	1 part

4. Breeding in fowls: For successful poultry farming, systematic breeding of fowls must be practiced. The largest and healthy fowls should be selected for breeding purpose and should be separated from weak, sick, stunt fowls.

3. Study the given diagram and answer the following questions. 1+3=4

(a) Label A and B.

(b) Write any three differences between A and B.





A: A = Sinuauricular node (SA)

B=Auricoventricular node(AV)

B: Any three differences between A and B are:

Sinuauricular node	Auricoventricular node
It is present at the entrance of the superior venacava in the right atrium.	It is present close to the inter-atrial septum near the right AV aperture.
It spreads the impulse to both the atria	It spreads impulses to the ventricles
It doesn't pick up the impulse from anywhere, it itself initiates the cardiac impulse.	It picks up the impulse generated by the SA node



4. Overpopulation is a major issue in the development of the nation. Highlight the socio-economic problems caused by overpopulation and mention how to solve such problems.

2+2=4

Ans: As overpopulation is the major issue in the development of the nation, it causes many problems to socio-economic which are given below:



1. Overpopulation creates problems of unemployment because manpower increases with the increase in population. It is not possible to provide job to all the people because government has limited resources and means.
2. Overpopulation also adversely affects the availability of health services and facilities.

These problems can be solved by the following ways:

1. Health and services should be increased in the proportion to growing population.
2. Expansion of employment exchanges and more assistance to self employed people

Group 'C' (2 x 8 = 16)

5. Mention the causative agent, mode of transmission, symptoms and control measures of tuberculosis in the community. (1+2+3+ 2 =8)

Ans: The causative agent of tuberculosis is a bacteria called mycobacterium tuberculosis.

The mode of transmissions are as follow:

1. In direct transmission, an infectious agent is transferred from a reservoir to a susceptible host by direct contact or droplet spread.
2. Vectors such as mosquitoes, flies and ticks may carry an infectious agent through purely mechanical means or may support growth or changes in the agent.
3. Self swallowing of the infected sputum is an open case of pulmonary tuberculosis which may also cause the infection.
4. Ingestion of the bovine tubercle bacilli from the mil of diseased cows may also infect healthy people.

The symptoms of tuberculosis are:



1. Chest pain
2. Persistent coughing for more than 2 weeks.
3. Mid fever(especially temperature rises in the evening)
4. Sweating at night
5. Loss of appetite and weight
6. Anorexia(tendency of vomiting)

The controlling measures of tuberculosis are:

1. Improvement of housing, nutrition and personal hygiene.
2. BCG vaccination
3. Proper sanitation(health education)
4. Covering the mouth and nose when coughing or sneezing reduces the spread of TB bacteria.

6. Draw a labelled diagram of the alimentary canal of a human being. Explain the mechanism of the digestion of foods that a person undertakes. What would happen in the digestion when the pancreas is removed? (3+4+1)

Ans:





Fig: Human alimentary canal

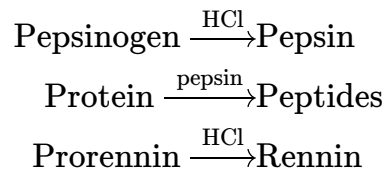
The mechanism of the digestion of foods that a person undertakes are:

i) Digestion in the buccal cavity (mouth): In the buccal cavity, mastication of food takes place. After that, food is mixed with saliva. Saliva contains salivary amylase(ptyalin) and lingual lipase enzymes.

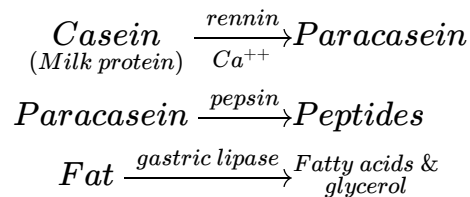
Now, the bolus conducts the oesophagus and reaches the stomach.



ii) Digestion in the stomach: When food reaches the stomach, it is mixed with gastric juice which contains HCL, pepsinogen, prorennin and gastric lipase. HCL makes food acidic. It kills harmful germs of food. It converts inactive pepsinogen into active pepsin.

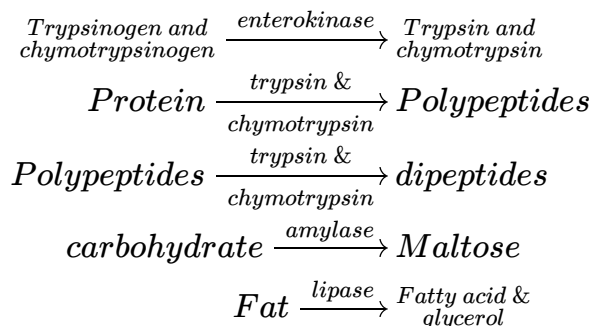


Rennin converts milk protein casein into paracasein in presence of calcium.

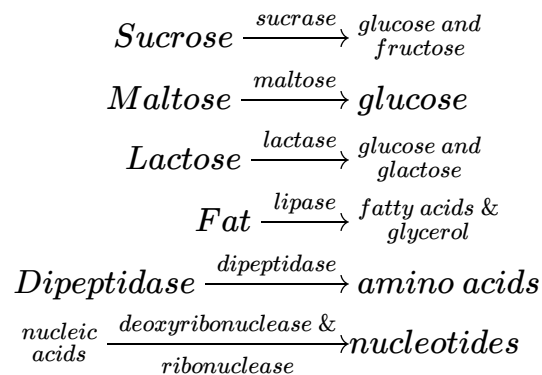


Now, chyme passes towards the duodenum.

In the duodenum, food mixes with bile and pancreatic juice. Bile neutralizes the acidic chyme. It also kills harmful germs and helps in the emulsification of fat. Pancreatic juice contains trypsinogen, chymotrypsinogen, amylase and lipase.



The small intestine produces intestinal juice which contains sucrose, maltase, lactase, dipeptidase, lipase, deoxyribonuclease and sucrase converts sucrose into glucose and fructose



In digestion, when the pancreas is removed then there will be a lack of digestive enzymes produced by the pancreas which lead to weight loss and diarrhoea.

OR

Draw a labelled drawing of the respiratory system of a human being. Why and how oxygen and carbon dioxide are exchanged rapidly in the lungs? What would happen if a person moves to a high altitude? Write your views on how to solve it. (2 +4+ 1+1 =8)

Ans:

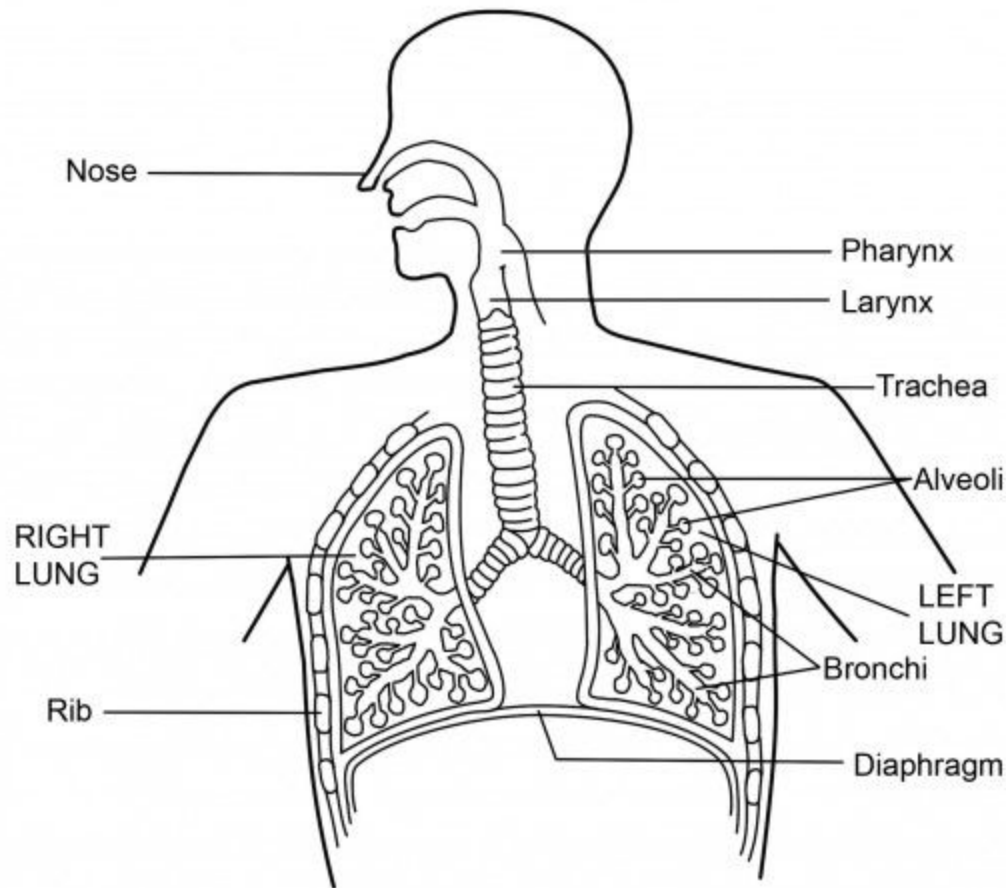


Fig: Human respiratory system

Oxygen and carbon dioxide are exchanged rapidly in the lungs because the air in the lungs has a higher concentration of oxygen than that of oxygen-depleted blood and a lower concentration of carbon dioxide. The concentration gradient allows for gas exchange during respiration.

Oxygen and carbon dioxide are respiratory gases. Exchange of O_2 and CO_2 takes place in the alveoli of the lungs. There is a network of blood capillaries outside the alveoli. The alveolar wall and capillary wall fuse with each other forming a thin respiratory membrane. The exchange of gases takes place through this membrane. During respiration, partial pressure of oxygen (PO_2) is higher in alveoli than capillary blood, but the partial pressure of CO_2 (PCO_2) is higher in blood than in alveoli. Due to this pressure gradient, O_2 diffuses in the blood from alveoli and CO_2 diffuses in alveoli from blood.



in a couple of days or get worse, get to a lower elevation as quickly as possible. Don't exert yourself.



Sharing Is Caring ❤️



Related Posts

- [NEB Grade 12 English Model Question Paper](#)
- [NEB Grade 12 Physics Model Question Paper](#)
- [NEB Grade 12 Chemistry Model Question Paper](#)
- [NEB Grade 12 Biology Model Question Paper](#)
- [NEB Grade 12 Computer Science Model Question Paper](#)
- [NEB Grade 12 Chemistry Model Paper Solution](#)
- [NEB Grade 12 Math Model Paper Solution](#)



Bipin Khatri

(Bipo)

Class 12 complete notes and paper collection.

Folders

Name ↑



Biology



chemistry



English



maths



Nepali



Physics



Drive

Feedbacks:

admin@bipinkhatri.com.np | bipinkhatri.ram@gmail.com

Contact:



@im.bipo



www.bipinkhatri.com.np



@im.bipo