Biology

MODEL QUESTIONS

Grade: 12 F.M.: 75

Attempt all questions

1

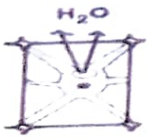
Part: I [Botany]

Group 'A'

Circle the correct answer from the given alternatives. [5×1=5]

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.
   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 chromosomes.
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
3. The given vascular bundle is highly specialised by centripetal protoxylem. What is it called?
   a. Exarch b. Endarch
   c. Mesarch d. Centrach
4. Which of the following plants is used as bio fertilizer?

   a. Volvox b. *Funaria*
   c. Azolla d. Rhizopus
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 shrunken protoplast in such plasmolysed cell?



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

Group 'B'

Give short answers to the following questions. [4×4=16]

1. The anatomical structure of vascular plant is given. Study the given diagram and answer the following questions. [1+3]

   a. Write the main characteristics for 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 cambial ring.
2. Write the salient features of a monocot embryo in reference to its development pattern with diagrams. [3+1]
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 micropropagation technique in plants. [4]
4. What is genetic material? Describe the structure and functions of RNA. [1+2+1]
   OR
   What are plant growth hormones? Write the physiological functions of auxin. Mention its shortcoming of hyper use in crops.

Group 'C'

Give long answers to the following questions. [2×8=16]

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

Part: II [Zoology]

Group 'A'

Circle the correct answer from the given alternatives. [6×1=6]

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
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?
   a. Secretes FSH and LH continuously
   b. Secretes oxytocin and relaxin
   c. Automatically degenerates after sometimes
   d. Remains intact and active
3. Which of the following statement is more appropriate for early an amniocentesis test?
   a. It take place between 15th and 20th weeks of pregnancy

b. It may cause fetal injury and lethality
c. It helps to detect fetal complications
d. It may cause infertility

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

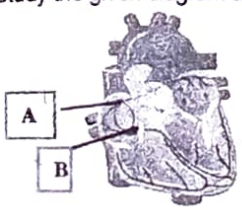
5. Blood cells are formed in the bone marrow. What is the process of formation of blood called?
   a. Haemopoiesis b. Haemolysis
   c. Lymphopoiesis d. Erythroblastosis

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

Group 'B'

Give short answers to the following questions. [4×4=16]

1. Compare and contrast areolar tissue and adipose tissue.[2+2]
2. Describe the process of fertilization of an egg with reference a frog. [4]
   OR
   Describe the various steps applied in poultry farming. [4]
3. Study the given diagram and answer the following questions.[1+3]



   a. Label A and B.
   b. Write any three differences between A and B.
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]

Group 'C'

Give long answers to the following questions. [2×8=16]

5. Mention the causative agent, mode of transmission, symptoms and control measures of tuberculosis in the community. [1+2+3+2]
6. Draw a labelled diagram of the alimentary canal of a human being. Explain the mechanism of the digestion of foods that a person under takes. What would happen in digestion when the pancreas is removed? [3+4+1]
   OR
   Draw a labelled drawing of 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 high altitude? Write your views on how to solve it. [2+4+1+1]

2

Part: I [Botany]

Group 'A'

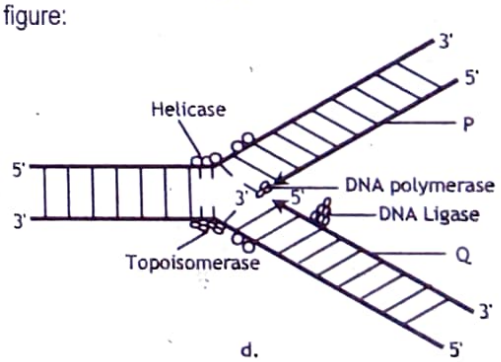
Circle the correct answer from the given alternatives. [5×1=5]

1. Xylem in root is
   a. centripetal b. centrifugal or centrifugal
   c. centrifugal d. centripetal and centrifugal
2. When the cell is fully turgid, its
   a. DPD=OP b. DPD=0
   c. WP=TP d. OP=0
3. In Blackman's law of limiting factors, the rate of photosynthesis continuous to increase with the successive increase in the amount of
   a. CO_2, light and temperature
   b. temperature, light and CO_2
   c. light, temperature and CO_2
   d. light, CO_2 and temperature
4. Which of the following step is common between aerobic and anaerobic respiration?
   a. TCA /Krebs cycle b. ETS
   c. EMP cycle/Glycolysis d. Photoxidation
5. RNA differs in DNA in nature of
   a. Sugar and purines b. sugar and pyrimidines
   c. Purines and phosphates d. sugar and phosphate

Group 'B'

Give short answers to the following questions. [4×4=16]

1. Define collenchyma. Point out the function of collenchyma.[1+3]
2. Answer the following questions on the basis of the given figure:



d.

   a. Which template strand forms leading and laggin strand? [1]
   b. Identify P and Q. [1]
   c. What is RNA primar? [1]
   d. What is the role of DNA polymerase? [1]
3. Explain the process of grafting with its importance. [3+1]
4. Explain the role/application of genetic engineering in the field of agriculture. [4]
   OR
   Explain the application of biotechnology in agricultural sciences. [4]

Group 'C'

Give long answers to the following questions. [2×8=16]

5. What is glycolysis? Explain with the help of required reactions. Trace its end products in both aerobic and anaerobic respiration. [1+3+2+2]

OR

Define photosynthesis and describe the experiment to demonstrate that CO_2 is necessary for photosynthesis (Moll's apparatus). [1+7]

6. What is DNA and describe the process of DNA replication found in semi-conservative method with neat and clean diagrams. [1+7]

Part: II [Zoology]

Group 'A'

Circle the correct answer from the given alternatives. **[6×1=6]**

1. 'Reticulin fibres' are associated with
   a. retina b. reticulocytes
   c. phagocytosis d. all of the above
2. Bicuspid valve (or mitral valve) in mammalian heart is located at the opening of:
   a. Lt. auriculo-ventricular b. Rt. auriculo-ventricular
   c. Lt. ventriculo-auricular d. Rt. ventriculo-auricular
3. Kidney stones are:
   a. Crystals of silica
   b. Crystals of sodium chloride
   c. Crystals of calcium oxalate
   d. Crystals of sodium bicarbonate
4. Two systems having opposite actions on the same organs are
   a. Exocrine and Endocrine systems
   b. Muscular and Nervous systems
   c. Nervous and Endocrine systems
   d. Sympathetic and Parasympathetic nervous system
5. The function of sertoti cells
   a. Produce spermatocytes
   b. secrete harmone
   c. nourish spermatozoa
   d. lubricating cells
6. Which of the following drugs is specifically used in ascariasis?
   a. metronidazole b. zidovudine
   c. piperazine d. niclosamide

Group 'B'

Give short answers to the following questions. **[4×4=16]**

1. What is Haversian canal system? Describe in brief with a diagram. [1+3]
2. Describe spermatogenesis in frog in brief. [4]
   OR
   What is pisci culture? Give a brief account on fish farming. [1+3]
3. What is drug abuse? Discuss on types of drugs, causes, effects and control of drug addiction. [1+3]
4. What is digestion? Describe physiology of digestion of protein. [1+3]

Group 'C'

Give long answers to the following questions. **[2×8=16]**

5. Describe structure and working mechanism of human eye in detail. [3+5]
6. Give the causative agent, symptoms and control measures of cholera. [2+3+3]
   OR
   Describe the structure and functions of various types of proper connective tissues. [3+5]

3

Part: I [Botany]

Group 'A'

Circle the correct answer from the given alternatives. **[5×1=5]**

1. The age of a tree can be determined by
   a. counting the number of branches
   b. measuring the diameter of stem
   c. counting the number of annual rings
   d. the study of roots
2. Accumulation of K^+ ions in guard cell leads to
   a. increased turgidity b. close stomata
   c. exosmosis of water d. increase water potential
3. The empirical formula/structure for chlorophyll a is
   a. $C_{35}H_{72}O_5N_4Mg$ b. $C_{65}H_{70}O_6N_4Mg$
   c. $C_{55}H_{72}O_5N_4Mg$ d. $C_{45}H_{70}O_6N_4Mg$
4. Glycolysis is found in cytoplasm of all types of aerobic/anaerobic cells. In this process, glucose is converted into a 3C-compound, which is
   a. citric acid b. pyruvic acid
   c. acetyle CoA d. PEP
5. A hybrid tall plant produces both tall and dwarf plants on self pollination. This proves
   a. principle of dominance
   b. law of segregation
   c. law of independent assortment
   d. all of these

Group 'B'

Give short answers to the following questions. **[4×4=16]**

1. Name two elements of pholen bundle. Structure and function of pholem tissue. [1+3]
2. What is the basis of Mendelian genetics? Explain the law of segregation of characters. [1+3]
3. Write short note on different steps of double fertilization with necessary diagram. [4]
4. Explain different types of sterilization techniques used in tissue culture. [4]
   OR
   Describe in brief about movement of variation. [4]

Group 'C'

Give long answers to the following questions. **[2×8=16]**

5. What is transpiration? Mention its types. Point out its advantages and disadvantages. [1+1+3+3]
   OR
   What is photosynthesis? Describe the necessity of CO_2 for photosynthesis. [1+7]
6. What is sex-linked inheritance? Explain it with reference to eye colour of Drosophilla. (Fruit fly). [1+7]

Part: II [Zoology]

Group 'A'

Circle the correct answer from the given alternatives. **[6×1=6]**

1. Mast cell in the connective tissue resembles in function with a type of leucocytes, that is
   a. basophils b. monocytes
   c. plasma cells d. sertoli cells
2. Name of cells that produce male sex harmone testosterone is
   a. Interstitial cells b. Leydigs' cells
   c. Sertoli' cells d. Both a and b

3. Endocrinology denotes the study of:
   a. endocrine organs and glands
   b. proteins and digestive enzymes
   c. internal environment
   d. reproductive glands only
4. Nerves whenever receive stimulus, suddenly shows exitability character as a result impulse flows ahead with the exchange of the ions. The saltatory movement of ions occurs in-
   a. medullated nerve fibre
   b. non-medullated nerve fibre
   c. muscles fibres
   d. dendrons of neurons
5. The function of rennin is:
   a. Degradation of angiotensinogen
   b. Stimulation of corpus luteum
   c. To reduce blood pressure
   d. Vasodilatation
6. The incorrect statement about AIDS is:
   a. Person appears well till 2 yearsw of infection
   b. risk of transmission from mother to foetus is about 30%
   c. virus affects CD_4 cells
   d. confirmatory test is usually the western blot test

Group 'B'

Give short answers to the following questions. **[4×4=16]**

1. Draw a labelled diagram of spermatogoon of frog. Describe structure in brief. [2+2]
2. Describe menstrual cycle in brief. [4]
   OR
   What is vaccination? Describe various types of vaccines. [1+3]
3. What are the fundamental characters of nervous tissue? Describe the structure of a neuron. [1+3]
4. What is uremia? Describe causes, effects and major symptoms. [1+3]

Group 'C'

Give long answers to the following questions. **[2×8=16]**

5. Describe structure and function of various digestive glands associated with the digestive system of man. [4+4]
6. What is AIDS? Write what you know about AIDs. [1+7]
   OR
   What is population explosion? Discuss causes, impacts and control strategies of human population growth. [1+7]

4

Part: I [Botany]

Group 'A'

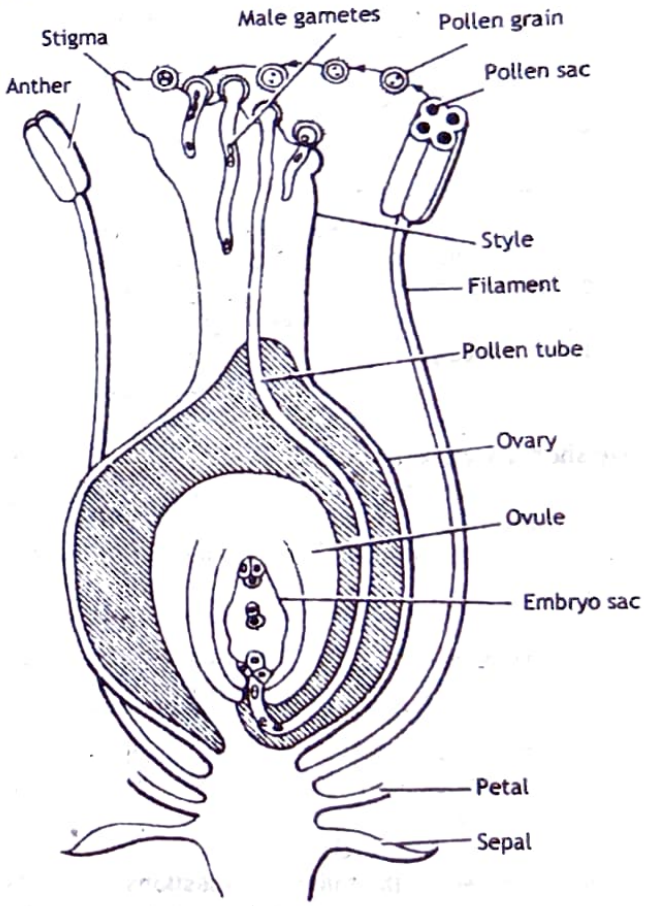
Circle the correct answer from the given alternatives. **[5×1=5]**

1. Function of sclerenchyma is to
   a. give mechanical support
   b. prepare food
   c. help in respiration
   d. help in transpiration
2. The hormone that controls the outflow of potassium from guard cell is
   a. ABA
   b. IAA
   c. gibberellins
   d. NAA
3. Richmond-Lang's effect is controlled by
   a. cytokinin
   b. auxin
   c. GA
   d. ABA
4. Photochrome is found in
   a. angiosperms
   b. gymnosperms
   c. pteridophytes
   d. all
5. The most studied material in genetics is
   a. *Drosophila*
   b. *Neurospora*
   c. Maize
   d. Wheat

Group 'B'

Give short answers to the following questions. **[4×4=16]**

1. Define phloem. Differentiate between xyleon and phloem. [1+3]
2. What is criss-cross patterns of inheritance? Point out its significance. [1+3]
3. Answer the following questions on the basis of the given figure:



   a. What is double fertilization? [1]
   b. Define porogamy and mesogamy. [1]
   c. Given two significance of double fertilization. [1]
4. Discuss in brief about the methods of plant tissue culture. [4]
   OR
   Define senescence and explain its significance. [1+3]

Group 'C'

Give long answers to the following questions. **[2×8=16]**

5. What is respiration? Describe the various steps involved in Kreb's cycle. [1+7]
   OR
   What is photosynthesis? Describe various factors that affect photosynthesis. [1+7]
6. Define genetic material and describe the process involved in semi-consequative method of DNA replication with neat and clean diagram. [1+7]

Part: II [Zoology]

Group 'A'

Circle the correct answer from the given alternatives. [6×1=6]

1. A part of our body where the axons may be more than a meter in length is
   a. Spinal cord b. Cranial nerves
   c. Some spinal nerves d. Autonomic nervous system
2. Eustachian tube connects
   a. middle ear and pharynx
   b. internal ear and pharynx
   c. middle ear and internal ear
   d. external ear and middle ear
3. In children sometimes testes jerk out of the scrotum during accident. This is mainly due to absent of-
   a. Spermatic code b. Gubernaculum
   c. Muscular tissue d. Epididymis
4. Endocrinology denotes the study of:
   a. endocrine organs and glands
   b. proteins and digestive enzymes
   c. internal environment
   d. reproductive glands only
5. Scala typani is connected with scala vestibuli by
   a. Eustachian canal b. Scala media
   c. Helicotrema d. Fenestra rotunda.
6. Which fishes are not exotic species?
   a. Indian carps b. Common carps
   c. Tilapia d. Rainbow trout

Group 'B'

ve short answers to the following questions. [4×4=16]

Draw a labelled diagram of unfertilized egg of frog. Describe structure in brief. [2+2]

What is a brain stem? Describe different parts of brain stem in brief. [1+3]

OR

What is pisci culture? Give a brief account on fish farming. [1+3]

Describe structure, location and functions of various types of simple epithetical tissues. [1+1+2]

What is the early warning or signs of lung disease? Which respiratory diseases are more concerned with elderly and infants? Explain. [1+3]

Group 'C'

ve long answers to the following questions. [2×8=16]

Give a detail account on cultivable fishes, types of ponds, breeding technology and advantages of fish farming in the context of Nepal. [1+2+5]

Give the account on the structure and working mechanism of human heart. [3+5]

OR

Describe structure and function of different types of skeleton issues. [3+5]

5

Part: I [Botany]

Group 'A'

the correct answer from the given alternatives. [5×1=5]

ll type in xylem transporting sap inside the plant
helical tracheids and vessels
pitted tracheids and wood parenchyma
c. fusiform tracheids and vessels
d. annular tracheids and wood parenchyma

2. Ganong's Potometer is used to measure
   a. growth rate b. photosynthetic rate
   c. respiratory rate d. transpiration rate
3. The carbon dioxide acceptor in C_3-plants is
   a. phosphoenol-pyruvate (PEP)
   b. Ribulose 1, 5 diphosphate (RuBP)
   c. Phosphoglyceric acid (PGA.
   d. Ribulose monophosphate (RuMP)
4. Glycolysis is a process in which glucose is degraded into:
   a. two carbon sugar in the absence of oxygen
   b. three carbon sugar in the absence of oxygen
   c. three carbon sugar in the presence of oxygen
   d. four carbon sugar in he presence of oxygen
5. Turner's syndrome is represented by
   a. XYY b. X0
   c. XXX d. XXY

Group 'B'

Give short answers to the following questions. [4×4=16]

1. Mention the function of parenchyma. What are the roles of meristem? Explain. [1+3]
2. What is allopolyploidy? Explain it with suitable example. [1+3]
3. Embryogeny is a process of development of embryo from zygote.
   a. What is the nature of zygote and endosperm? [1]
   b. What is the role of haustorial cell? [1]
   c. Give two differences between monocot and dicot embryo development. [2]
4. What is selection? Describe different types of selection. [1+3]
   OR
   What is allopolyploidy? Explain it with suitable example. [1+3]

Group 'C'

Give long answers to the following questions. [2×8=16]

5. Define photosynthesis and describe any experiment regarding the photosynthesis studied by you. [1+7]
   OR
   Describe the different types of plant growth movement. [8]
6. What is DNA? Describe the process of semi conservative method of DNA replication with good diagrams. [1+7]

Part: II [Zoology]

Group 'A'

Circle the correct answer from the given alternatives. [6×1=6]

1. The cells commonly found in loose connective tissue are
   a. Fibrocytes and histocytes
   b. Fibroblasts, histocytes, mast cells, plasma cells and wanderinhg leucocytes
   c. Mast cells and amoebocytes
   d. Fibers and wandering leucocytes
2. The human heart has no Sinus venosus. It appears that it has been absorbed in the wall of
   a. Right auricle b. left auricle
   c. Both a & b d. Right ventricle
3. Human sperm is divisible into head, body and tail regions. In which part of the sperm enzyme haluronidase is synthesized-
   a. head of the sperm
   b. in the Golgi bodies of acrosome
   c. in the Lysosome of acrosome
   d. in the main body and tail regions

4. Neurohypophysis is
   a. anterior pituitary b. posterior pituitary
   c. intermediated pituitary d. Lateral pituitary
5. Human brain is divisible into fore, mid and hind brains. Which one of the following is not a part of fore brain?
   a. Telencephalon b. Rhinencephalon
   c. Diencephalon d. Rhombencephalon
6. Transplantation of tissues or organs within the same individual is called
   a. autograft b. isograft
   c. allograft d. xenograft

Group 'B'

Give short answers to the following questions. **[4×4=16]**

1. Narrate the process of fertilization in frog. Also mention the effects of fertilization in egg. [2+2]
2. Describe mechanism of breathing with diagrams. [2+2]
   OR
   What is amniocentesis? How is it performed? Describe advantages and disadvantages. [1+1+2]
3. Mention the general characteristics of connective tissues. Describe areolar tissue with a diagram. [1+3]
4. Differentiate between 'J' shaped and 'S' shaped population growth curves. [4]

Group 'C'

Give long answers to the following questions. **[2×8=16]**

5. Describe male reproductive system in human with labelled diagrams. [3+5]
6. What is organ transplantation? Describe various types of transplantation. Also, mention advantages and risks of transplantation. [1+2+5]
   OR
   Describe the structure and function of three types of muscular tissues. [3+5]

6

Part: I [Botany]

Group 'A'

Circle the correct answer from the given alternatives. **[5×1=5]**

1. Cambium helps in
   a. growth of plant b. secondary growth
   c. reproduction d. seed formation
2. Loss of water in the form of vapour from the living tissues of aerial parts of plant is termed as
   a. evaporation b. transpiration
   c. wilting d. dehydration
3. Moll's half leaf experiment can prove
   a. water is required for photosynthesis
   b. water, oxygen and CO_2 are required for photosynthesis
   c. CO_2 are required for photosynthesis
   d. O_2 are required for photosynthesis
4. Where does glycolysis and TCA (Krebs) cycle occur in cell?
   a. glycolysis in cytosol and TCA cycle in stroma of chloroplast.
   b. glycolysis in cytosol and TCA cycle in matrix of mitochondrion
   c. glycolysis in matrix of mitochondrion and TCA cycle on inner membrane of mitochondria
   d. glycolysis in cytoplasm and TCA cycle in oxysomes of mitochondrion
5. 'Gametes are never hybrid' is the concept of
   a. law of dominance
   b. law of segregation
   c. law of independent assortment
   d. all of these

Group 'B'

Give short answers to the following questions. **[4×4=16]**

1. Write short note on structure and function of collenchyma. [2+2]
2. What is criss-cross patterns of inheritance? Point out its significance. [1+3]
3. What is vegetative reproduction? Point out the advantages and disadvantages of vegetative reproduction. [1+3]
4. How can you justify "bacteria and cyanobacteria act as a biofertilizers". [4]
   OR
   Describe the development of monocot embryo. [4]

Group 'C'

Give long answers to the following questions. **[2×8=16]**

5. Describe the light dependent steps of photosynthesis. How are they linked to the dark reaction ? Discuss. [2+2+4]
   OR
6. Plant growth harmones control different physiological activities at a site remote from its place of production. [2]
   a. Name two plant growth promotors.
   b. Identify the plant growth harmones that helps in . . . [6]
      i. apical dominance.
      ii. bolting in rosette plants.
      iii. delay of senescence
      iv. breaking of dormancy.
      v. delayed ripening
      vi. nodule formation.

Part: II [Zoology]

Group 'A'

Circle the correct answer from the given alternatives. **[6×1=6]**

1. Which of the following epithelium is not designated on the basis of cell shape and cell layering?
   a. Simple squamous epithelium
   b. Transitional epithelium
   c. Pseudo-stratified epithelium
   d. Endothelium
2. Emulsification of fat is done by
   a. Na_2CO_3 and $NaHCO_3$ of bile
   b. Sodium taurocholate and sodium glycocholate of bile
   c. Bilirubin and biliverdin
   d. Pancreatic juice
3. No. of spermatozoa produced at the end of spermatogenesis
   a. 4 b. 2
   c. 8 d. none
4. What is the site of metabolic hormone?
   a. Pituitory gland b. Thyroid gland
   c. Pancreas d. Adrenal glands
5. The resting potential of the membrance of a nerve fibre:
   a. 50 to 70 mv b. –100 to – 110 mv
   c. 50 to 100 mv d. –20 to 30 mv
6. The very common air born disease is-
   a. typhoid b. AIDS
   c. cancer d. tuberculosis

Group 'B'

Give short answers to the following questions. **[4×4=16]**

1. Describe the process of cleavage upto the formation of morula stage with necessary diagrams. [2+2]
2. What is a hepatic portal system? Describe with diagram. [1+3]

   OR

   How can IFV technology (test tube baby) be a boon for child intended sterile parents? Describe its procedure in brief. [1+3]
3. How do you differentiate compact bone from spongy bone? Describe structure of a compact bone with a diagram. [1+3]
4. Name any three bacterial diseases of man and mention how these are combated. [1+3]

Group 'C'

Give long answers to the following questions. **[2×8=16]**

5. Give an account of structure and function of a nephron in human being. [4+4]
6. Give a detailed account of causative agent, symptoms and control measures of candidiasis. [8]

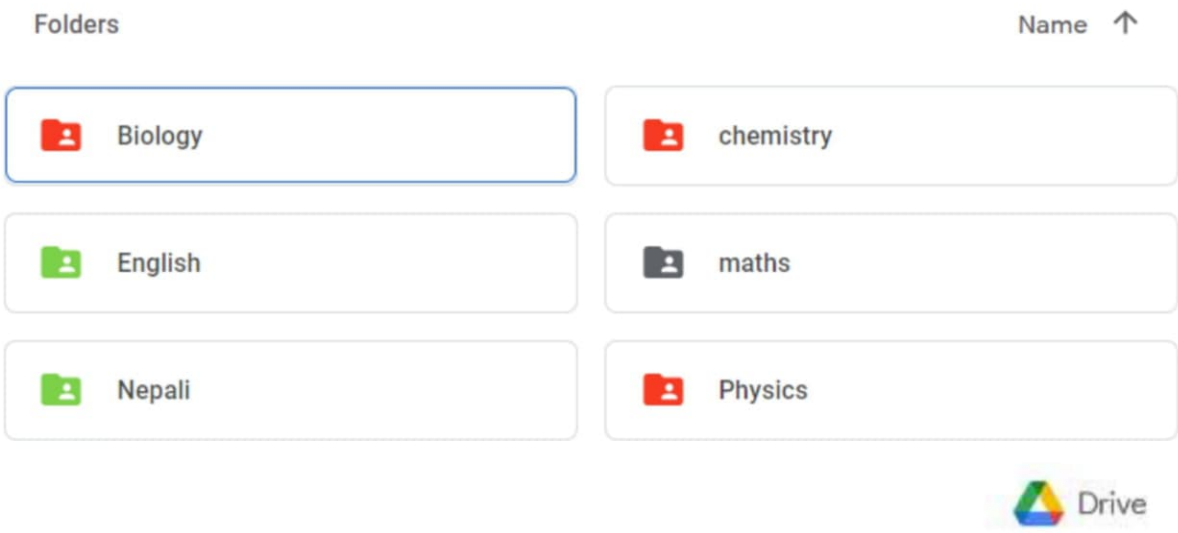
   OR

   Differentiate between spermatogenesis and oogenesis. Describe the process of gametogenesis in frog in detail. [3+5]

Bipin Khatri

(Bipo)

Class 12 complete notes and paper collection.



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