

This question paper contains 4 printed pages.

Your Roll No.

Sl. No. of Ques. Paper : 124

I

Unique Paper Code : 32231102

Name of Paper : Perspectives in Ecology

Name of Course : B.Sc. (Hons.) Zoology

Semester : I

Duration : 3 hours

Maximum Marks : 75

***(Write your Roll No. on the top immediately
on receipt of this question paper.)***

***Attempt five questions in all.
Question No. 1 is compulsor***

(a) Define the following:

- (i) Life table**
- (ii) Fecundity**
- (iii) Oligotrophic lake**
- (iv) Species diversity.**

4

(b) Distinguish between the following:

- (i) Autogenic and Allogenic succession**
- (ii) Unitary and Modular population**
- (iii) Grazing and Detritus food chain**
- (iv) Neritic and Benthic zone.**

6

(c) State whether true or false. Also correct the false statements:

- (i) Flow of energy in an ecosystem is bidirectional.
- (ii) Type I functional response of predator can stabilize prey population density.
- (iii) The upper asymptote is also known as the carrying capacity of a population in a sigmoid growth curve.
- (iv) Competition, parasitism and predation are examples of density-independent factors of population regulation. 4

(d) Match the following: 5

- | | |
|------------------------------------|-----------------------|
| 1. Competitive exclusion principle | (a) Ernst Haeckel |
| 2. Law of minimum | (b) Charles Darwin |
| 3. Ecology | (c) A.G. Tansley |
| 4. Ecological pyramid | (d) Justus von Liebig |
| 5. Polyclimax theory | (e) Charles Elton |
| | (f) Georgy Gause |

(e) Fill in the blanks:

- (i) is also known as the tension zone or the zone of stress.
- (ii) The area actually inhabited by the tigers in whole of Jim Corbett National Park would be termed as its density.

(iii) Permanently frozen deeper soil in tundra is called as

(iv) Assimilation efficiency in carnivores is than in herbivores. 4

(f) Illustrate the following with the help of diagrams (no description required):

(i) Universal energy flow model

(ii) Dispersion patterns. 4

(a) Explain the exponential and logistic growth forms of population with the help of suitable diagrams and equations.

(b) Write a note on density dependent factors with suitable examples. 7,5

(a) Define biogeochemical cycle. Explain nitrogen cycle emphasizing on the role of microorganisms in it.

(b) Explain Shelford's law of tolerance with suitable examples. 7,5

(a) Define ecological succession. Explain the various theories of climax in succession.

(b) Differentiate between ecosystem and biome. Explain the components of an ecosystem with any one ecosystem as an example. 5,7

5. (a) Describe Lotka-Volterra model for predation with the help of diagrams and equations.
- (b) Differentiate between r- and k-selected species. 8,4
6. Write short notes on any *three* of the following:
- (a) Vertical stratification in a temperate lake
- (b) Edge effect
- (c) Temperature as a limiting factor
- (d) Lindeman's efficiency
- (e) Population interactions. 4,4,4

is question paper contains 4 printed pages.]

Your Roll No.....

No. of Question Paper : 923

I

Question Paper Code : 32235908

Name of the Paper : Insect Vector and Diseases

Name of the Course : Zoology : Generic Elective for Honours

Semester : I

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

Write your Roll No. on the top immediately on receipt of this question paper.

Attempt **five** questions in all including Question No. 1, which is compulsory.

(a) Define the following : (5)

(i) Reservoir host

(ii) Zoonosis

(iii) Moulting

(iv) Instar

(v) Fecundity

P.T.O.

(b) Distinguish between the following :

- (i) Endemic typhus and epidemic typhus
- (ii) Physical and biological vector
- (iii) Primary and secondary host
- (iv) Clavate and pectinate antenna
- (v) Adult of rat flea and dog flea

(c) Match the following :

- (i) Housefly (a) Hymenoptera
- (ii) Bedbug (b) Jumping legs
- (iii) Rat flea (c) Piercing and sucking type mouthparts
- (iv) Wasp (d) Organ of Berlese

(d) Name the vector associated with following disease

- (i) Myiasis
- (ii) Trench fever
- (iii) Chagas disease
- (iv) Dengue fever
- (v) Visceral leishmaniasis

(e) Expand the following :

(4)

(i) WHO

(ii) JH

(iii) NICD

(iv) NMEP

(f) State whether the following statements are true or false :

(4)

(i) Bed bug transmits kala azar causing pathogen.

(ii) Both male and female fleas suck the blood.

(iii) Aristate type of antenna is found in housefly.

(iv) Elytra are found in beetles.

(a) Describe the biology of culex mosquitoes. Add a note on elephantiasis.

(8)

(b) Write the characteristic features of order hemiptera and siphunculata (Anoplura).

(4)

Describe the biology, medical importance and control of *Xenopsylla cheopis*.

(12)

4. (a) Write the distinguished features of *Musca domestica*. Describe its life cycle, and control measures.
- (b) Explain the different type of antennae with suitable examples.
5. (a) Discuss in detail the life cycle, medical importance and control measures of *Cimex lectularius*.
- (b) Draw well labelled diagram of mouthparts of mosquito. Add a note on its feeding mechanism.
6. (a) Give brief account of any three sand fly-borne diseases.
- (b) Describe the measures to control all the three medically important lice.
7. Write short notes on any **three** of the following: (4)
- (i) Dengue
 - (ii) Typhus fever
 - (iii) Chagas disease
 - (iv) General features of insects

(1) 39 copies

This question paper contains 4 printed pages.

Your Roll No.

Sl. No. of Ques. Paper : 125

I

Unique Paper Code : 32231301

Name of Paper : Diversity of Chordates

Name of Course : B.Sc. (Hons.) Zoology

Semester : III

Duration : 3 hours

Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

*Attempt five questions in all, including Question No. 1
which is compulsory. All the parts of a question must be
attempted together. Draw neat and labelled
diagrams, wherever necessary.*

1. (a) Fill in the blanks:

(i) are called the tail feathers in birds.

(ii) The term 'Realm' was coined by

(iii) is a lizard with bifid tongue.

(iv) Limbless amphibians belong to the order

(v) marsupial is present in North America.

(vi) *Ornithorhynchus* and *Echidna* belong to subclass

6

P. T. O.

(b) Give the exact location of the following:

- (i) Endostyle
- (ii) Hatschek's pit
- (iii) Jacobson's organ
- (iv) Rhamphotheca
- (v) Carapace.

5

(c) Give the function of the following:

- (i) Preen gland
- (ii) Operculum
- (iii) Chloride cells
- (iv) Lateral line.

4

(d) Differentiate between the following:

- (i) Archaeornithes and Neornithes
- (ii) Cycloid and Ctenoid scale
- (iii) Urochordata and Cephalochordata
- (iv) Proteroglyphous and Opisthoglyphous.

6

(e) State True or False:

- (i) Tornaria larva belongs to *Balanoglossus*.
- (ii) One pair of temporal fossae is present in anapsids.
- (iii) Kiwi is restricted to the forests of New Zealand only.
- (iv) Cyclostomes are jawed vertebrates.
- (v) Devonian is the age of reptiles.

10. Pheasant belongs to the order Galliformes. 6
11. Give an account of larval forms in protochordates with example.
12. All vertebrates are chordates but not all chordates are vertebrates. Justify. Also enlist any four characteristic features of vertebrates. 8,4
13. Discuss origin and ancestry of Amphibia.
14. Describe the biting mechanism of a poisonous snake. 6,6
15. Explain the mode of osmoregulation in teleosts.
16. What is adaptive radiation? Explain with reference to locomotory appendages in mammals. 6,6
17. Discuss parental care in fishes.
18. Enumerate the general characters of Prototherians. 8,4
19. Give an account of migration in birds. 12
20. Write short notes on any three of the following:
- (a) Catadromous migration

P. T. O.

- (b) Continental Drift Theory
- (c) *Sphenodon*
- (d) Retrogressive metamorphosis.

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This question paper contains 4 printed pages.

Your Roll No.

Sl. No. of Ques. Paper : 126 **I**
Unique Paper Code : 32231302
**Name of Paper : Physiology: Controlling and
Coordinating Systems**
Name of Course : B.Sc. (Hons.) Zoology
Semester : III
Duration : 3 hours
Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt five questions in all. Question No. 1 is compulsory. Make well labelled diagrams wherever necessary.

(a) Define the following:

- (i) Permissive effect
- (ii) Osteon
- (iii) Synapse
- (iv) Latent period.

1×4=4

(b) Differentiate between the following:

- (i) Tight and gap junction
- (ii) Rods and cones
- (iii) Bone and cartilage
- (iv) Isotonic and isometric contraction
- (v) IPSP and EPSP

P. T. O.

(vi) Chemical synapse and electrical synapse. 2×6=12

(c) Fill in the blanks:

(i) is an enzyme that phosphorylates other cellular proteins.

(ii) binds to Ca^{2+} enabling even more Ca^{2+} to be sequestered as stored within the sarcoplasmic reticulum.

(iii) The period of time when secondary sexual characteristics begin to develop and the potential for sexual reproduction is reached is called The first occurrence of menstruation is called, and the permanent cessation of menstruation is called

(iv) is the hormone secreted by zona glomerulosa of adrenal cortex.

(v) is the process by which graded potentials are added together.

(vi) The of endometrium lines the uterine cavity and sloughs off during menstruation.

(vii) is the structural unit of a compact bone.

(viii) A is a bundle of axon located in the central nervous system. 1/2×10=

(d) Expand the following abbreviations:

- (i) RMP
- (ii) ICSH
- (iii) PNS
- (iv) FOG
- (v) SON
- (vi) AChE

$1/2 \times 6 = 3$

(e) Give exact location and function of the following:

- (i) Cremaster muscle
- (ii) Amacrine cell
- (iii) Sertoli cells
- (iv) Chief cells
- (v) Volkmann's canal
- (vi) Muscle spindle.

$1/2 \times 6 = 3$

(a) Discuss the mode of action of water and lipid soluble hormones with suitable diagram. 7

(b) Delineate the steps in the synthesis and secretion of thyroid hormones. 5

(a) Discuss briefly the events involved in excitation-contraction coupling cycle. 8

(b) How does sarcomere length influence the maximum tension that is possible during muscle contraction? 4

P. T. O.

4. (a) Explain the generation and propagation of action potential in continuous and saltatory conduction with suitable diagram. 85L
- (b) Discuss the factors affecting the speed of propagation. 4
5. (a) Outline the major events of each phase of uterine cycle and correlate them with the events of the ovarian cycle. 9
- (b) Add a note on the role of blood testis barrier. 3
6. (a) How do hair cells in cochlea and vestibular apparatus transduce mechanical vibrations into electrical signals? 5
- (b) Describe the location, structure and function of different types of connective tissue. 7
7. Write short notes on any *three* :
- (a) Ultrastructure of skeletal muscle
- (b) Histology of adrenal gland
- (c) Rhodopsin-retinal visual cycle with suitable diagram
- (d) Hormonal control of testicular function. 4x

This question paper contains 4 printed pages.

Your Roll No. _____

Sl. No. of Ques. Paper : 127 I
Unique Paper Code : 32231303
Name of Paper : Fundamentals of Biochemistry
Name of Course : B.Sc. (Hons.) Zoology
Semester : III
Duration : 3 hours
Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt five questions in all. Question No. 1 is compulsory. Make well labelled diagrams wherever necessary.

- (a) Define the following:
- (i) Molecular chaperones
 - (ii) Epimers
 - (iii) Zwitter ions
 - (iv) Holoenzyme
 - (v) Plasmalogens. 5
- (b) Give the structural formulae for the following:
- (i) Isoleucine
 - (ii) Haworth projection formula for α -D-Glucose
 - (iii) Pyrimidine
 - (iv) Arachidonic acid. 4

P. T. O.

- (c) Differentiate between the following:
- (i) Oxidoreductase and Transferase
 - (ii) *t*-RNA and *m*-RNA
 - (iii) Amylose and Amylopectin
 - (iv) Cysteine and Cystine
 - (v) Triglycerides and Phospholipids.
- (d) Fill in the blanks:
- (i) bonds are not broken on denaturation.
 - (ii) DNA exhibits upon annealing.
 - (iii) Competitive inhibitor K_m value of enzyme.
 - (iv) Interconversion of α and β forms of mono saccharides is called
 - (v) Lock and Key theory was given by
- (e) Give reasons for the following:
- (a) Saturated fatty acids are waxy solids while unsaturated fatty acids of same chain length are oily liquids.
 - (ii) Sucrose does not give a positive reaction with Benedict's solution.
 - (iii) Regulatory enzymes show sigmoid saturation curve.
2. (a) Give the structure and function of any two storage polysaccharides and two structural polysaccharides.

(b) Write a note on isomerism in carbohydrates. 8,4

(a) Derive an equation for determining relation of K_m with substrate concentration and rate of reaction.

(b) Discuss the factors governing rate of an enzyme catalyzed reaction. 8,4

(a) Discuss the salient features of Watson and Crick model of DNA.

(b) Describe briefly the different types of DNA. 6,6

(a) Discuss the different levels of protein organization with suitable diagrams.

(b) Explain the physiological importance of amino acids.

9,3

(a) Explain the structural and functional features of phospholipids.

(b) How are triacylglycerols formed? What are the advantages of using them as stored fuels? 6,6

Write short notes on any *three* of the following:

(a) Lineweaver Burke plot

(b) Cot curves

P. T. O.

(c) Sphingolipids

(d) Glycoconjugates.

4,4,4

[This question paper contains 4 printed pages]

Your Roll No. :

Sl. No. of Q. Paper : **343** **I**

Unique Paper Code : 42167902

Name of the Course : **B.Sc.(Prog.) Life Sciences**
DSE-1A

Name of the Paper : Cell and Molecular
Biology

Semester : V

Time : 3 Hours **Maximum Marks : 75**

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
 - (b) Attempt any **five** questions in all. Question **NO.1** is compulsory.
 - (c) All questions carry equal marks. Answer all parts of a question together.
1. (a) Define the following (any **ten**) : 10
- (i) Central dogma
 - (ii) Genetic code

P.T.O.

- (iii) Aquaporin
- (iv) Transcription
- (v) Nucleotide
- (vi) Okazaki fragments
- (vii) Intron
- (viii) Diplotene
- (ix) Idiogram
- (x) Ribozymes
- (xi) Refractive index
- (xii) Inducible operon

(b) Expand the following terms (any **five**) :

- (i) ORF
- (ii) NPC
- (iii) PCR
- (iv) FISH
- (v) STEM
- (vi) ATP

2. Write short notes on (Any **three** with suitable diagram) : $5 \times 3 = 15$

- (i) Nucleosome
- (ii) Function of Golgi complex
- (iii) t - RNA
- (iv) Synaptonemal complex
- (v) Karyotype

3. Differentiate the following (any **five**). Draw the diagram wherever is required : $3 \times 5 = 15$

- (i) Mitosis and meiosis
- (ii) Heterochromatin and euchromatin
- (iii) Mitochondrial DNA and chloroplast DNA
- (iv) Prokaryote and Eukaryote
- (v) TEM and SEM
- (vi) Primary and secondary cell wall
- (vii) Leading and lagging strand

4. (a) Discuss transcription in Prokaryotes. 8
- (b) Discuss the membrane proteins and their functions. 7
5. (a) Explain the structure of lysosome, its function and disease associated with it. 7
- (b) Briefly discuss gene expression in Eukaryotes. 8
6. (a) Explain the Transformation experiment with diagram. 8
- (b) Draw the structure of Lampbrush Chromosome. 3
- (c) Draw the structure of Mitochondria and mention its function. 4
7. (a) Describe the Operon Model with the help of diagrams. 5
- (b) What are the differences between light and electron microscopy? 5
- (c) Differentiate between active and passive transport. 5

This question paper contains 3 printed pages.

Your Roll No.

Sl. No. of Ques. Paper : 1056 IC
Unique Paper Code : 32235906
Name of Paper : Food, Nutrition & Health
Name of Course : Zoology : G.E.
Semester : III
Duration : 3 hours
Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt five questions in all.

Question No. 1 is compulsory.

1. (a) Fill in the blanks :
- (i) Thick, yellowish, *VISCOUS* liquid secreted by mother soon after delivery is called
 - (ii) A triglyceride has and
 - (iii) The full form of RDA is
 - (iv) Tissues that store fats are called
 - (v) The major compound present in vitamin E is
..... 5

(b) Define the following terms :

- (i) Xerophthalmia
- (ii) Antioxidants
- (iii) Neurocysticercosis

P.T.O.

(iv) Amoebiasis

(v) Prophylaxis.

(c) State whether the following statements are True or False and justify :

(i) Alanine is a sulphur containing amino acid.

(ii) Blood pressure is reduced when dietary lipids are reduced.

(iii) Rice is the richest source of Beta carotene.

(iv) Glycogen is an unbranched polysaccharide molecule.

(v) Carbohydrate present in milk is known as lactose.

(vi) Typhoid fever is spread by mosquito bite.

(d) Choose the correct answer :

(i) Deficiency / Excess of carbohydrates results in ketosis.

(ii) Olive oil is a good example of MUFA / PUFA.

(iii) Pernicious anaemia is caused by deficiency of iron / Vitamin B₁₂.

(iv) Malaria is spread by mosquito bite / contaminated water.

(v) The most abundant mineral in the body is Calcium / Phosphorus.

(vi) Cholera/Obesity is a lifestyle disease.

2. Write about mode of transmission, causative agent, sources of infection, symptoms and prevention of any two viral infections studied by you.

3. Describe the life cycle, pathogenesis of *Ascaris lumbricoides*. Add a note on prophylaxis and treatment of its infection in man.

Write a note on Iodine deficiency. Explain the functions and regulation of the thyroid gland. Discuss the key points of the National Iodine Deficiency Disorders Control Program. 12

Discuss the social health problems, their causes and prevention through dietary and life style modifications, especially among the youth. 12

Give an account of the varied functions of protein in the human body. What are the rich dietary sources of proteins? Discuss Protein Energy Malnutrition giving the deficiency diseases. 12

Write short notes on any *three* of the following :

- (i) Causes and symptoms of AIDS
- (ii) Diabetes mellitus
- (iii) Food spoilage
- (iv) Purification methods of drinking water
- (v) Balanced diet.

4,4,4

[This question paper contains 4 printed pages]

Your Roll No. :

Sl. No. of Q. Paper : **204** **I**

Unique Paper Code : 42231102

Name of the Course : **B.Sc.(Prog.)**

Name of the Paper : Animal Diversity

Semester : I

Time : 3 Hours **Maximum Marks : 75**

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) There are **two** sections, **Section-A** and **Section-B** to be answered on separate answer-sheets.
- (c) Answer **three** questions from each section, including Question No. 1 which is compulsory.
- (d) Draw labelled diagrams wherever necessary.

P.T.O.

Section - A
NONCHORDATE

1. (a) Define the following terms : 4
- (i) Enterocoel
 - (ii) Vector
 - (iii) Cephalization
 - (iv) Bilateral Symmetry
- (b) Give the scientific names of the following : 2
- (i) Cuttle fish
 - (ii) Sea mouse
 - (iii) Glass rope sponge
 - (iv) Feather star
- (c) Classify the following upto class : 4
- (i) *Limulus*
 - (ii) *Octopus*
 - (iii) *Nereis*
 - (iv) *Tubipora*
- (d) Differentiate between the following terms : 4
- (i) Ostium and osculum
 - (ii) Gravid and mature proglottid
 - (iii) Protogyny and protandry
 - (iv) Monogenetic and digenetic life history

2. (a) Discuss in detail the general features of kingdom Protista. 6
(b) Explain Sol-Gel theory of locomotion in Protozoa. 6
3. (a) Draw a labelled sketch and explain the structure of water vascular system in Starfish. 8
(b) Explain the mechanism of locomotion in Starfish. 4
4. Write short notes on any **two** of the following : 6+6
(a) Mosaic vision
(b) Metamorphosis in Insects
(c) Polymorphism in Hydrozoa
(d) General features of phylum Mollusca

Section - B

CHORDATA

1. (a) Define the following terms : 4
(i) Perching
(ii) Endothermy
(iii) Osmoconformers
(iv) Holobranch

2. (a) Discuss in detail the general features of kingdom Protista. 6
(b) Explain Sol-Gel theory of locomotion in Protozoa. 6
3. (a) Draw a labelled sketch and explain the structure of water vascular system in Starfish. 8
(b) Explain the mechanism of locomotion in Starfish. 4
4. Write short notes on any **two** of the following : 6+6
(a) Mosaic vision
(b) Metamorphosis in Insects
(c) Polymorphism in Hydrozoa
(d) General features of phylum Mollusca

Section - B

CHORDATA

1. (a) Define the following terms : 4
(i) Perching
(ii) Endothermy
(iii) Osmoconformers
(iv) Holobranch

(b) Give location and function of the following :

3

- (i) Patagia
- (ii) Wheel organ
- (iii) Pygostyle

(c) Differentiate between the following terms :

6

- (i) Anapsida and diapsida
- (ii) Euryhaline and stenohaline
- (iii) Ratitae and carinatae
- (iv) Lemuroidea and tarsioidea

2. (a) Give an account of salient features of Protochordata.

7

(b) Discuss phylogeny of Hemichordates.

5

3. Explain in detail the various ways of parental care in Amphibians.

12

4. Write short notes on any **two** of the following :

6+6

- (a) Flight adaptations in birds
- (b) Osmoregulation in fishes
- (c) Evolution of Primates
- (d) General features of Agnatha

This question paper contains 4 printed pages]

Your Roll No. :

Sl. No. of Q. Paper : 210 I

Unique Paper Code : 42164301

Name of the Course : B.Sc.(Prog.)

Name of the Paper : Plant Anatomy and Embryology

Semester : III

Time : 3 Hours **Maximum Marks : 75**

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) Attempt **five** questions in all, including question number **one** which is **compulsory**.
- (c) Draw well-labelled diagrams wherever necessary.
- (d) All parts of the questions should be answered together.

1. (a) Fill in the blanks :

1×5=5

- (i) Xylem is generally reduced in plants.
- (ii) Interfascicular cambium in dicot stem differentiates from cells belonging to

P.T.O.

- (iii) The microgametophyte of angiosperms is commonly known as
- (iv) In type of embryo sac development, all the cells of embryo sac have the same genetic constitution.
- (v) is a fleshy out growth of integument which covers the seed more or less completely and is often considered as an integument.
- (b) Give the appropriate term for the following :
1×5=5
- (i) Stomata with three unequal subsidiary cells.
 - (ii) Maturation of male and female parts of a flower at different times.
 - (iii) Ovule in which micropyle , chalaza and funiculus are in one straight line.
 - (iv) Root tissue which gives rise to lateral roots.
 - (v) Tissue generally composed of dead cells with thick secondary walls.
- (c) Draw well-labelled diagrams of the following :
2.5×2=5
- (i) T. S. *Hydrilla* stem
 - (ii) T. S. tetrasporangiate anther with amoeboid tapetum and spore tetrads

2. Write short notes on any **five** of the following :

3×5=15

- (a) Heart wood
- (b) Male germ unit
- (c) Polyembryony
- (d) Antipodal cells
- (e) Root apex
- (f) Stomata

3. Differentiate between any **three** of the following :

5×3=15

- (a) Anemophily and Entomophily
- (b) Tunica Corpus theory and Korper-Kappe theory
- (c) Monocot root and monocot stem
- (d) Apospory and Diplospory

4. Answer briefly any **five** of the following :

3×5=15

- (a) What is the biological significance of seed dispersal phenomenon ? Elaborate on any **one** mechanism of seed dispersal.
- (b) What is microgametogenesis ? Describe the process with suitable diagrams.
- (c) What are annular growth rings and how are they formed ?

(d) What is the importance of endosperm ? How does nuclear endosperm develop ?

(e) What are the distinguishing features of collenchyma ? Write a note on the types and functions of collenchyma.

(f) What is periderm and how is it formed ?

5. Comment on any **three** of the following :

5×3=15

(a) Egg cell and synergid cells are structurally and functionally different.

(b) Phloem has cells with unique structure.

(c) Tapetum is an important anther wall layer.

(d) Xerophytes possess special anatomical features.

6. Attempt any **three** of the following :

5×3=15

(a) Write a brief account on development of a dicot embryo from a zygote.

(b) Discuss the significance of cross pollination. Write a note on the floral adaptations that favour cross pollination.

(c) With the help of suitable diagrams, describe secondary vascular growth in dicot roots.

(d) Write a detailed note on epidermis.